CORE NEEDLE BIOPSY TARGETING THE VIABLE AREA OF DEEP-SITED DOMINANT LESION VERIFIED BY COLOR DOPPLER AND/OR CONTRAST-ENHANCED ULTRASOUND CONTRIBUTE TO THE ACTIONABLE DIAGNOSIS OF THE PATIENTS SUSPICIOUS OF LYMPHOMA

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Objectives: The accuracy of ultrasound guided core needle biopsy (US-CNB) for lymphoma diagnosis requires improvement to satisfy the practitioners’ rely on this mini-invasive approach for lymphoma management.

Methods: Color Doppler flow imaging and/or contrast enhanced ultrasound were employed to select the viable target area on the dominant deep-site lesions detected by computer tomography or poison-emission tomography/computer tomography in the Viable-targeting CNB procedure, Institutional Review Board approval was obtained for this trial, and informed consents were signed for the procedure of US-CNB and CEUS. The recruited Patients were assigned to Viable-targeting CNB on demand by specialists with signaling willingness, or were assigned to routine procedure with grey-scale ultrasound evaluation and guidance (Routine CNB). The primary end-point was the superiority of the accuracy of viable-targeting CNB for clinically actionable diagnosis; second endpoints were complications, time consumption from CNB to actionable diagnosis, and cost-effectiveness.

Results: A total of 245 patients undergo Routine US-CNB (N=120) or Viable-targeting US-CNB (N=125), and revealed 91 (91/120, 75.8%) and 112 (112/125, 89.6%) conclusive diagnoses, respectively (p=0.004, OR 0.846, 95%CI: 0.753-0.952). 6 patients were excluded for non-conclusive diagnose and loss of follow-up, and 239 patients revealed final diagnoses with follow-up at least 6 months. the diagnostic yields of Routine US-CNB and viable-targeting US-CNB according to the final diagnosis were 78.4% (91/116) and 91.1% (112/123) (p=0.006, OR 0.554, 95%CI: 0.333-0.920). The yield of actionable diagnosis were 84.0% (84/100) and 91.8% (101/110) for lymphoma, 85.1% (80/94) and 92.3% (96/104) for NHL, 66.7% (4/6) and 83.3% (5/6) for HL, in the routine and viable-targeting groups respectively. No significant difference in the minor complications and no major abdominal or thoracic complications were observed. Time consumption between CNB and actionable diagnosis of the Viable-targeting group is less than that of Routine group. The estimated cost per true diagnosis of routine US-CNB () is more expensive than that () of Viable-targeting US-CNB. And subgroup analysis found that most lymphomas with conclusive diagnosis in US-CNB are with higher FDG-avid SUV. Binomial logistic regression revealed that conclusive diagnosis of CNB is correlated with ancillary studies of the CNB samples.

Conclusions: Targeting-viable US-CNB should replace the routine US-CNB to be the initial approach for biopsy the dominant lesion suspicious of lymphoma. And if failed with inconclusive diagnosis in this procedure, surgical excisional biopsy should be considered to complete the diagnosis, other than repeated CNB.
ULTRASONOGRAPHIC FEATURES OF PAROTID GLAND STONES

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Objectives
To investigate ultrasonographic features and their correlation with clinical outcomes in the parotid gland stones

Methods
The medical records of a total of 36 patients who had been treated for parotid gland stones were retrospectively reviewed. Four (11.1%) of patients had multiple stones and a total of 40 stones were identified. Mean size of stones was 4.4 mm (range 2-13.5). Acute infection was combined in 14 (38.9%) patients. Stones were removed by transoral approach in 12 (33.3%) patients, by transfacial approach in 14 (38.9%) patients, by sialendoscopy in 7 (19.5%) patients, and by combined approach in 3 (8.3%) patients.

Results
Ultrasonography could localize 39 stones except 1 small stone in the orifice of Stensen’s duct. The location of stones was distal in 17 (42.5%) stones, middle in 7 (17.5%) stones, proximal in 16 (40.0%) stones. Acoustic shadow was identified in 25 (62.5%) stones. Stensen’s duct was dilated in 26 (72.2%) patients and mean diameter of the dilated duct was 3.5 mm (range 0.8–7.3). Parenchymal echogenicity in stone side was more hypoechoic compared with normal side in 15 (41.7%) patients. The distal stones were treated by transoral approach in 13 (76.5%) stones, the middle stones were treated by sialendoscopy in 4 (57.1%) or by transfacial approach in 3 (42.9%) stone, and the proximal stones were treated by transfacial approach in 12 (75.0%) stones. The surgical approaches were significantly different in relation to the location of stones (P=0.000). Stensen’s ductal dilatation was significantly correlated with presence of acute infection (P=0.022), the ductal diameter more than 3.6mm could predict the presence of infection with 88.9% sensitivity and 94.4% specificity.

Conclusions.
Ultrasonographic assessment of the location of stones and the diameter of Stensen’s duct provides useful clinical information for the management of parotid gland stones.
US-GUIDED HIGH CONCENTRATION DEXTROSE PERIMYSIUM DISSECTION FOR MYOFASCIAL PAIN: THE HEMODYNAMIC CHANGE

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Objectives
The purpose of the study is to evaluate the hemodynamic change of myofascial pain post US guided high concentration dextrose solution injection perimysium dissection.

Methods
We prospectively collected total 48 patients complaint of myofascial pain (M: F=19: 29, age ranged 23-82 yrs, average 60.3) from Jan. 2018 to Nov. 2018. All patients suffered from tenderness over lesion site (upper trunk :44, lower trunk: 4). Patients’ pain was graded from 3 to 9 with average of 6.2 by visual analog score(VAS). Under US guided 10cc of 15% dextrose solution was injected and dissected each layer of perimysium. Color Doppler ultrasound was performed before injection and post injection then recording the images or video clips in the PACS. The CDUS was graded into 5 grades from grade 0 (no color signal increased), 1 (2 fold or <10% color signals increased), 2 (3 folds or 10%-50% color signals increased), 3 (3-5 folds or >50% color signals increased), 4 (5 folds or 100% color signals increased) according to the color signals changed. All patients will be evaluated with the severity of symptoms as documented by visual analogue scale (VAS) at 1 months after treatment.

Results
There were 17 patients (35.4%) had pain-free, 21 patients (43.8%) had more than 50% improvement, only 6 patients had mild improvement less than 50%, 4 patients had no change after treatment. The CDUS grading were grade 4 in 16 patients, grade 3 in 13 patients, grade 2 in 9 patients, grade 1 in 5 patients, grade 0 in 5 patients. The mean reported VAS score was 6.2 in pre-treatment and 1.4 in after-treatment.

Conclusions.
US guided 15% dextrose solution injection with perimysium dissection is effective in the management of myofascial pain. One of the important mechanism should enroll the improvement of the hemodynamic change after treatment.
Prediction of left atrial appendage occluder size by implantation simulation with left atrial appendage 3D printing model: comparison with conventional method based on transesophageal echocardiography

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Objectives: To assess the accuracy of left atrial appendage (LAA) occluder size determination system by implantation simulation using 3D printing model, compared with conventional method based on transesophageal echocardiography (TEE).

Methods: We retrospectively reviewed 34 cases with percutaneous LAA occlusion using Amplatzer Cardiac Plug (St. Jude Medical, Inc.) from 2014 to 2016. Cases without cardiac CT (n=12) or with peridevice leakage on six months follow up TEE (n=6), or paroxysmal atrial fibrillation cases (n=2) were excluded. Finally, 14 cases with anatomically and physiologically properly implanted LAA occluder were included in the study and the implanted device size was used as a standard reference. We generated 3D printing model based on cardiac CT images using fused deposition modeling P400 ABS material (Figure 1A). LAA occluder size was determined by two ways: 1) device implantation simulation using 3D printing model and occluder devices (Figure 1B), and 2) conventional 2D TEE measurements by 2 experienced cardiologists. The measured LAA occlude sizes were compared with the size of actually implanted device.

Results: By conventional TEE measures, the accuracy of device size proper prediction was 42.8% and the bias of size difference compared with the properly implanted device was -1.14 (-5.13 to 2.84). As plotted in Figure 1E, there were two cases (6mm and 4mm underestimation by TEE) with size prediction error more than 2mm (>1 device-size difference). By prediction system based on 3D printing model, the accuracy of device size prediction was 78.6% and the bias of size difference compared with the properly implanted device was -0.42 (-2.10 to 1.42). Notably, there was no case with size prediction error more than 2mm (Figure 1E).
Conclusions: LAA occluder size prediction using 3D printing based device implantation simulation method showed excellent accuracy, compared with conventional method based on TEE.
PRESENTATION OF THE “THYRO-SCREEN PROJECT” - THE FIRST INTERDISCIPLINARY INTEGRATED AND TARGETED THYROID SCREENING.

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Objectives: This project has three main stages. The first step was the development of a computerized-diagnostic-algorithm used to stratify the risk in thyroid pathology, based on Ultrasonography. It set the optimum time for thyroid biopsy (FNAB). We have used the latest international classifications, as well as a score made by us, correlated with the histopathological results. The second stage included a targeted thyroid screening in a population with high-risk, statistically significant. Finally, we are launching an interdisciplinary-multicentric-US-screening titled “Thyro-Screen”.

Method: We report a thyroid screening performed on 4386 apparently healthy adults with oncological risk factors+, aged over 20 years, followed for three years. We used the TIRADS classification by Russ-modified and Strain-Elastography, with both the elastographic-scores by Rago and semiquantitative-Strain-Ratio (SR), for standardization and to establish if fine-needle-aspiration-biopsy (FNAB) should be performed. We designed an Ultrasound-Scoring-System (USS) for predicting malignancy and a diagnostic-algorithm-software. All patients were stored and counted into electronic-database.

Results: 861 patients with thyroid diffuse disease and 696 with focal lesions were found. Prevalence of thyroid pathology was: 38.99% (95%CI: 37.54% to 40.45%) with screening sensitivity: 96.49% and specificity: 96.52 % and a high accuracy of 96.51%, PPV: 94.66%, NPV: 97.73 %, statistically significant, p<0.01. The ROC-analysis of our US-methods confirmed a higher level of diagnostic accuracy of Strain Elastography, p<0.001, AUC=0.995, 95%CI:0.97 to 1.

Conclusions: Performing US-Screening together with Strain-Elastography, had the best accuracy in analysis of the vascular network and absence of elasticity, for differentiating “benign versus malignant” of the thyroid tumors and for diagnosis of the diffuse thyroid diseases.
THE HEAD (CRANIAL /BRAIN) ULTRASONOGRAPHY AS AN EXPERIMENTAL TARGETED SCREENING AT THE NEWBORNS AND INFANTS WITH HIGH-RISK OF HYPOXIC-ISCHEMIC BRAIN INJURY, FINDING THE CORRELATION WITH SUBSEQUENT NEUROPSYCHIATRIC DISORDERS AND FOLLOW-UP AT THE PRIMARY CARE LEVEL.

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Background: Cranial Ultrasonography is an investigation that requires expertise and allows differential diagnosis among normal images of the brain and a number of complications that can include: periventricular leucomalacia(PVL), intraventricular hemorrhage(IVH) and various types of brain malformations(hydrocephalus). Most cases of brain lesions develop in the first week after birth and can be detected by Ultrasound/MRI only after several weeks for delivery when infants are already in evidence at the family doctor. These pathology increase a baby's risk for developing disabilities that may range from mild learning or gross motor delays to cerebral palsy along with other subsequent neuropsychiatric disorders.

Methods: The Cranial-Ultrasound-Screening was performed on 500 high-risk newborns (preterm and full-term neonates) with at least two Ultrasound examinations, the first of three weeks and the second at 14 weeks. Positive patients detected on screening were examined also with Strain-Elastography, then were monitored by a neuropsychiatry specialist(MRI) and finally follow-up by us, for a 5-year period, to identify subsequent neuropsychiatric disorders used the Bayley IIIScales. We used We had designed a computerized ultrasound software and a diagnostic algorithm using international classifications (Volpe and Papile) of intra-peri-ventricular hemorrhage or PVL to the infants. Gold Standard Method was MRI.

Results: We analyzed the results of this Cranial Screening, at the newborns and infants with high-risk of hypoxic-ischemic injury, which we obtained a high prevalence:41.6%, sensitivity:92.79%, specificity:91.44%,and accuracy:92%,p<0.01. Then we analyzed the descriptive case statistics, and we performed the comparative statistical analysis AUROC/ANOVA of our ultrasonographic techniques. We have found some correlations between severe brain injuries in premature newborns, and a series of neuro-psycho-motor pathologies, secondary to the evolution of these patients.

Conclusion:We detected positive on this screening many asymptomatic infants with the ischemic-hypoxic-hemorrhage encephalopathy and we monitored the neuro-psychiatric disorders subsequently developed to these patients, over a 5-year period, that we had classified according to the initial pathology and affected brain area.
ULTRASOUND EDUCATION FOR MEDICAL STUDENTS (A DEGUM-MODEL)

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Objectives:
As we know, that early education in ultrasound techniques is valuable, we started a programme, where we adopted the course model for basic ultrasound courses abdomen/retroperitoneum in Germany to a university setting, educating medical students in their 5th year.

Methods:
Therefore we minimized time and topics from 3d (24h lessons) to 6 lessons of 1.5 hours, including 30min of lecture and 1h of practice. The course took place over 6 weeks following the schedule of medical school. Intensive work has to be done to compress the issues of all relevant detail in abdomen/retroperitoneum. There was a maximum of 10 students, educated by 2 tutors, mostly accompanied by a certified trainer (DEGUM III). The course was evaluated and afterwards compared with a standard basic course for young medical professionals.

Results:
There were two aspects to mention: First, all medical students evaluated the course to a higher satisfied level than the young professionals. The evaluation score and topics are shown in detail in the presentation. Second: the course finishes with an exam (standard diagnostic procedure) where tutors look at special skills i.e. using the scanner, recognizing the organs, acting with the machine and the patient...There is a check-box with these items which displays the learning effect of each of the participants.

Conclusions:
Medical students learn faster and more intense the technique of abdominal ultrasound. They are more keen on the topics and interested in the technique which is shown in their higher satisfied level in the evaluation, compared to young medical professionals. Even the practical skills are easier to learn for them, as shown in the examination results. Therefore the education of ultrasound, both theory and practice, should be placed in the schedule of medical school.
SHEAR WAVE ELASTOGRAPHY OF THE COMMON CAROTID ARTERY (CCA): ASSESSMENT OF ARTERIAL WALL BIOMECHANICAL PROPERTIES AND REPRODUCIBILITY OF YOUNG’S MODULUS (YM) ESTIMATES IN HEALTHY INDIVIDUALS.

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Background
Arterial stiffness is an important biomarker for cardiovascular disease. Shear wave elastography (SWE) provides quantitative information about stiffness of tissues and recent studies have suggested potential vascular applications. The purpose of this study was to investigate the suitability of SWE to quantify Young’s modulus (YM) of the common carotid artery (CCA) and evaluate inter-and intra-observer reproducibility in healthy individuals.

Methods
Following research ethical committee approval and informed consent, CCA longitudinal sections of participants’ CCAs were scanned using a Supersonic Aixplorer ultrasound system with L15-4 probe. YM was measured in 2mm regions of interest across 5 frames. Reproducibility was assessed within a subgroup of 16 participants by two operators (novice and experienced) in two sessions > 1 week apart.

Results
Seventy-three participants with mean age of 40±10 years, and body mass index (BMI) of 26 ±6 kg/m² were enrolled in this study. Male carotid YM estimates were 59 kPa ±19 compared to 56 kPa ±12 in women, which was not significantly different (p= 0.48). The average YM of the carotid artery walls was 58 kPa ±15 (57 ±15 kPa for the anterior wall and 58 ±20 kPa for the posterior wall, p=0.75). There was no significant difference in mean YM estimates of the CCA between observers (observer one 51 ±14 kPa and observer two 55 ±17 kPa (p=0.46). Reproducibility within and between operators was fair to good (with ICCs ranging from 0.46 to 0.71). The inter-frame coefficient of variation was 28% for both operators.

Conclusions
SWE was able to provide an estimate of YM in the CCA in healthy subjects (58 kPa) with fair to good reproducibility. This study demonstrated the potential of using SWE to assess biomechanical properties of blood vessels.
EVALUATION OF IMAGING PERFORMANCE OF SHEAR WAVE ELASTOGRAPHY (SWE) USING THE LEICESTER ELASTOGRAPHY PIPE PHANTOM (LEPP)

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Background
SWE is emerging imaging modality to quantify Young’s modulus (YM) of various tissues. Test objects are required to assess the performance of this new technology and for routine quality assurance. The Leicester Elastography Pipe Phantom (LEPP) has been developed to be analogous to the Edinburgh Pipe Phantom for B-mode imaging, with a focus on assessing elastography imaging performance. The aim of this study was to assess the potential value of the LEPP and investigate reproducibility of measurements within and between observers.

Methods
The LEPP consisted of 5 soft PVA-cryogel pipes (100 ± 30 kPa) with varying diameters (2 mm-12mm), surrounded by a stiffer (> 300 kPa) agar-based tissue mimicking material. A Supersonic Aixplorer ultrasound system was used to image longitudinal sections of each pipe at different depths and scanner settings. Different regions of interest of 2 mm diameter were used to quantify YM of the pipes. The penetration depth and YM measurements within each pipe were obtained by two blinded observers to assess reproducibility.

Results
Overall, 240 penetration depth measurements, and 146 YM quantifications were performed under standardized conditions. YM estimates decreased with increasing depth (140 kPa to 20 kPa). The penetration depth increased with increasing pipe diameter and use of the system’s built-in ‘penetration’ setting (with penetration depths of 5.3, 4.6, and 4.8 cm for a 12 mm pipe, compared to 3.9, 3.2, and 3 cm for a 2 mm pipe using ‘penetration’, ‘resolution’, and ‘standard’ settings, respectively). Reproducibility of the penetration depth measurements was excellent (intra-class correlation coefficients > 0.80 in all pipes).

Conclusions
Mean YM estimates within pipes decreases with increasing depth. Penetration mode and large pipe diameter provide the maximum penetration depth. Inter- and intra-observer reproducibility was excellent. This study demonstrates the feasibility of using the LEPP for performance assessment of elastography scanners.
AN EXPERIMENTAL ULTRASOUND SCREENING TO PATIENTS WITH ACUTE ABDOMINAL-PELVIC PAIN AT THE PRIMARY HEALTH CARE LEVEL – THE POINT OF CARE ULTRASONOGRAPHY (PoCUS) SURVEY AMONG EUROPEAN FAMILY DOCTORS WHO SUPPORT THE EFFECTIVENESS OF THIS METHOD IN THE FUTURE PRACTICE.

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Background: The PoCUS performed by the clinician is an important tool to guide and improve the case management for the early diagnosis and treatment. It represents basically, an extension and complement, to the clinical examination of the physician, to achieve an accurate positive and differential diagnosis.

Methods: Indications of PoCUS diagnoses are: the detection of stones/tumors, pathologic fluid/gases accumulation, enlarged organs, digestive tube paresis, aneurysms and obstruction of vessels, pleural-recesses-effusions. All these had presented a typical ultrasound pattern, and simple diagnostic criteria can be used. In connection with the clinical picture, the diagnosis could be very accurate and enough to start the treatment. We did a brainstorming and conducted an online-survey, about what we can apply yet in primary care. We designed a questionnaire with the PoCUS-applications which we distributed to family physicians from the European-research-networks (EGPRN, EURACT, WONCA). Then we made an Experimental-PoCUS-Screening on 3400 patients with acute-abdominal-pelvic-pain, who were examined first time by the family physician with experience, confirmed after, by the specialist. Each patient followed an ultrasound protocol, designed by us, and was archived in a database. We made an initial descriptive statistics of emergency pathology and finally were analyzed all data obtained at the PoCUS-Screening.

Results: We had a total of 450-doctors respondent to this PoCUS-survey. We made a comparative analysis of their answers. We wanted to find out which PoCUS applications are of great interest to family physicians from Europe. We met many differences among different European countries about clinical ultrasound practice, but opinion over 86% of the respondents was in favor of using PoCUS in the primary care practice. At the Ultrasound-Screening in Primary Care, the results and accuracy of the method were: 94,54%, sensitivity: 96,43%, specificity: 91,16%, p<0,001.

Conclusion: Because of a significant number of advantages, ultrasonography should be a diagnosis tool besides to the stethoscope in the general practitioner office. Early diagnosis can help to save many patients, in primary care, based on notions of good-clinical-practice (GCP).
NONINVASIVE DIAGNOSIS OF PORTAL HYPERTENSION USING SHAPE

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Objective
The current clinical standard for diagnosing portal hypertension is invasive and catheter based called hepatic vein pressure gradient (HVPG). As a non-invasive alternative, our group has shown the subharmonic amplitude of ultrasound contrast agents to be a good indicator of hydrostatic pressure (known as subharmonic aided pressure estimation or SHAPE). This study compared quantitative SHAPE to HVPG measurements to diagnose portal hypertension in patients undergoing a transjugular liver biopsy.

Methods
This ongoing IRB and FDA approved study has enrolled 174 transjugular liver biopsy subjects to date with a median age of 60 yrs (102 M and 72 F). A Logiq 9 ultrasound scanner with a 4C curvi-linear probe (GE, Waukesha, WI) was modified to acquire SHAPE data transmitting at 2.5 MHz and receive subharmonic signals at 1.25 MHz. Post biopsy an infusion of Sonazoid (GE, Oslo, Norway) was given at a rate of 1.44 L/kg/hour. Once the microbubble arrival was confirmed, an automated algorithm was run to select the optimal acoustic output power for maximum SHAPE sensitivity. Next, SHAPE data were collected from the portal and a hepatic vein in triplicate and compared to the catheter-based HVPG measurements.

Results
A strong positive correlation was obtained between the quantitative SHAPE pressure estimates and HVPG (r = 0.69). Patients with portal hypertension (i.e., HVPG > 10 mmHg) had a significantly higher SHAPE estimate than patients with lower HVPGs (-0.56 ± 3.27 vs. -5.16 ± 3.28 dB; p<0.0001) and SHAPE achieved a sensitivity of 95% and specificity of 85%. This difference was also seen with patients at an increased risk of variceal bleeding (i.e., HVPG > 12 mmHg; 0.08 ± 3.13 vs. -4.86 ± 3.42 dB; p<0.0001) with a sensitivity of 85% and specificity of 86% with SHAPE estimates.

Conclusions
Current results indicate that SHAPE can accurately and non-invasively detect elevated portal pressures.
Breast cancer is the most common malignant disease in women worldwide. We compare the results of digital 3D mammography - tomosynthesis (DBT) as a screening and sonography (US) method, as a complementary method to mammography.

**Objective:** To compare the data obtained in the US and DBT within a retrospective study of women with histologically confirmed breast cancer.

**Material and methods:** We processed retrospective data of 916 patients examined at the Clinic of Radiology from 25 December 2015 to 31 January 2019. The age of patients was from 29 years to 86 years, median 53 years. Biopsy following DBT was indicated in 357 cases. Of these, 78 were positive, others were benign. In the group of malignant lesions, we compared the findings with the DBT. We evaluated lesions size, morphological character, vascularization, number of deposits, changes in gland architecture, number and presence of microcalcifications and changes in lymph node. In our retrospective study, we aimed to verify the cross-compliance and equivalence of results obtained by the two imaging techniques. We evaluated the data using MC Nemar's test using paired tests (parametric t-test and non-parametric Wilcoxon test). We have tested the relationship with Spearman's correlation coefficient.

**Results:** The results are in the tables. The following results came from the comparison: Significant disagreement exists in visualization of vascularization, microcalcifications, even sizes, where e.g. DBT shows higher values, the methods also differ when comparing lesions by patient age. At age over 50 years, DBT is more accurate, compared to US at age 50 years. The low correlation of correspondence is also in the field of architectural changes. More accurate is the US.

**Discussion:** The disagreements of both methods are significant. And in all the retrospective study parameters. In women over 50 years of age, metastatic mammography is more accurate in the area of microcalcifications and changes in the area of lesions, bearing shapes are less suspect, and interstitial architecture is less convincing compared to US examinations. Women of younger age benefit from US, a combination of both modalities is essential. Both DBT and US are a complementary method to the golden standard of breast cancer screening - digital X-ray mammography. For suspicious and ambiguous images, both methods must be added, combined.

**Conclusion:** All statistical tests show that there are significant differences between the US and DBT methods in image processing of the same patient, and we can not accept the consistency of their imaging. We must accept their supplementation, combination.

Key words: breast cancer, sonography, digital breast tomography, correlation
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#ULTRASOUNDED

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Introduction: Social media has become an integral part of daily life with 38 million users in the United Kingdom and the average user being logged-in for 135 minutes daily. Social media is increasingly used to disseminate learning in a variety of fields including medicine.

Aim: To assess the current use of Instagram in disseminating ultrasound education.

Method: Instagram searches using the hashtags: #ultrasound and #radiology were conducted and the content of the retrieved posts reviewed. The posts were then classified into social or educational and the results were compared.

Results: 461,884 #Ultrasound posts were retrieved compared with 243,011 #Radiology posts. From the first 30 #ultrasound posts, 3 were educational and 27 were social. The social posts predominantly related to announcements of pregnancy. In comparison 21/30 #Radiology posts were educational while 9 were classified as social.

Discussion: There are a number of educational radiology and ultrasound accounts on Instagram. While the educational radiology posts are relatively easy to find, those for ultrasound are buried within a sea of social posts. We propose the adoption of the hashtag #UltrasoundEd to separate educational ultrasound posts and make them easier to identify. This is in order to allow the rapid free dissemination of ultrasound education.

Conclusion: Social media can be an invaluable education tool. Instagram is an ideal platform for this as it is image based. The use of a standardised hashtag (#UltrasoundEd) for ultrasound education will help easily identify relevant educational posts.
EARLY ASSESSMENT OF NEOADJUVANT CHEMOTHERAPY RESPONSE IN BREAST CANCER PATIENTS USING 3D SUBHARMONIC AIDED PRESSURE ESTIMATION

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Objectives

Neoadjuvant chemotherapy (NAC) is a well-established treatment option for patients with non-metastatic breast cancer. However, there is no established method to predict response allowing early therapy modification to potentially improve patients’ outcomes and minimize toxicity. The purpose of this study was to validate the results from a pilot study of 3D subharmonic aided pressure estimation (SHAPE) as a biomarker for predicting NAC response early in breast cancer patients.

Methods

In the initial phase, 11 patients scheduled for NAC of breast cancer underwent ultrasound exams after 0, 10, 60, and 100% of chemotherapy, while in the ongoing validation phase 11 women were studied after 10% of chemotherapy. Ultrasound exams were performed using a Logiq 9 (GE Healthcare, Waukesha, WI, USA) with a 4D10L probe. Modified software enabled RF data collection from 3D subharmonic imaging before and during an infusion of Definity (Lantheus, N Billerica, MA, USA) for SHAPE. The maximum subharmonic magnitude before and during the infusion was calculated and the difference between the tumor and surrounding area was compared to clinical outcomes.

Results

In the initial phase, there were 6 complete responders (CR) and 5 partial responders (PR). Results from 10% completion of chemotherapy showed subharmonic signals increased more in the tumor than in the surrounding area for CR compared to PR (3.23 ± 1.41 dB vs. -0.88 ± 1.46 dB; p=0.001). In the validation study, 5 subjects achieved CR, while 6 subjects were PR. Consistent with initial results there was a significant difference between CR and PR (1.98 ± 1.35 dB vs. 0.39 ± 0.43 dB; p=0.02). The combined results showed the same separation (2.66 ± 1.47 dB vs. -0.19 ± 1.17 dB; p<0.001).

Conclusions.

The validation phase confirmed the initial finding that the marker from SHAPE can predict NAC response of breast cancer as early as at 10% completion of therapy.
SUBHARMONIC CONTRAST-ENHANCED ULTRASOUND EVALUATION OF THE HEPATIC VEIN AS A SIGN OF PATHOPHYSIOLOGY CHANGE CAUSED BY PORTAL HYPERTENSION

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Objective: To determine if the presence of subharmonic imaging (SHI) signals inside the hepatic vein can be used as a qualitative sign of portal hypertension.

Methods: 98 patients underwent a SHI contrast US (CEUS) examination of their portal and hepatic veins using a modified Logiq 9 scanner (GE, Waukesha, WI) with a 4C probe. SHI is a new CEUS imaging technique where the receive frequency is half of the fundamental (1.25 and 2.5 MHz, respectively) resulting in better tissue suppression. Images were acquired after infusion of the ultrasound contrast agent Sonazoid (GE Healthcare, Oslo, Norway) and analyzed for the presence or absence of SHI signals in the hepatic vein; based on the assumption that in portal hypertensive patients SHI signals would be seen in the hepatic vein. These findings were compared to the hepatic venous pressure gradient (HVPG; i.e., the reference standard) obtained as part of their standard of care.

Results: Out of the 98 cases, 11 cases were excluded, 6 because the HVPG values were clinically discordant and 5 because the ROI used was close to the IVC junction. From the remaining 87 patients, 46 had increased HVPG values corresponding to subclinical and clinical portal hypertension (>5 and >10 mmHg, respectively) and 41 had normal HVPG values (< 5mmHg). Qualitative assessments of the digital clips acquired during the examinations showed that in all of the 46 cases with increased HVPG values a SHI signal was seen in the hepatic vein and from the 41 cases with normal HVPG values, 38 cases had no SHI signal in the hepatic vein. The overall accuracy was 97% (84/87) with a sensitivity of 100% (46/46) and specificity of 93% (38/41).

Conclusion: The presence of SHI signals inside the hepatic vein can be used as a qualitative sign of portal hypertension.
ULTRASOUND-TRIGGERED BULK ANTIBIOTIC RELEASE FROM NOVEL HARDWARE IN A RABBIT SPINAL INFECTION MODEL

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Objective: This study evaluated the efficacy of ultrasound-triggered drug delivery devices against bacterial infection in an ex vivo cadaveric rabbit spine model.

Methods: Polylactic acid (PLA)-coated, vancomycin (VAN)-loaded polyether ether ketone (PEEK) devices (1 cm³) with a drug-loading reservoir (0.785 cm³) were 3D printed. Two device designs were evaluated: 1 large hole for drug release vs 2 smaller holes. Clips were implanted medial to the spinal midline in mature (~6 months, 3 kg) female White New Zealand cadaveric rabbits (n=4) under an IACUC-approved protocol. To simulate infection, 10⁴ cfu of Staphylococcus aureus were added to 2 of the 4 sites; the other 2 sites were left clean. Two of the 4 sites (1 inoculated, 1 clean) were insonated for 20 minutes with a Logiq E9 ultrasound scanner (GE Healthcare) equipped with a C1-6 curvilinear probe, using power Doppler imaging (1.7MHz frequency, 6.4kHz PRF, 100% acoustic output power) to induce rupture of the PLA coating for VAN release. In parallel, positive and negative bacterial controls were evaluated. All implanted devices were incubated for 2 hours post-insonation, then retrieved for analysis. Results were collected in duplicate (n=16 total) and compared with a two-way ANOVA.

Results: Infected sites showed marked reduction in bacterial colonization following ultrasound-triggered VAN release, while uninsonated sites exhibited little reduction in bacterial colonization. At 48 hours, there was significantly greater VAN release from the insonated clips compared to the uninsonated clips (p < 0.04). There was significantly greater ultrasound-triggered total VAN release from the 1-hole device design than from the 2-hole design (7420±2992μg vs. 3500±954μg, p<0.0001). These levels are sufficient to prevent adhesion of S. aureus to implant materials.

Conclusion: This study demonstrated the feasibility of an ultrasound-mediated antibiotic delivery device, which could become a potent weapon against spinal surgical site infections.
US-GUIDED PERCUTANEOUS THERMAL ABLATION OF INTRA HEPATIC CHOLANGIOCARCINOMA: AN ITALIAN MULTICENTER STUDY

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Objectives
To compare long term results of Radiofrequency Thermal Ablation (RFA) with high-powered Microwaves Ablation (MWSA) in treatment of Intrahepatic Cholangiocarcinoma (ICC).

Methods
Results of 71 ICC patients (age range 59-84 years, mean 74; 47 males) with 88 nodules treated with RFA (36 patients) or MWS (35 patients) between January 2008 and June 2018 in 5 Ultrasound (US) interventional Units in Southern Italy were retrospectively reviewed. All procedures were performed percutaneously, under US guidance and under unconscious sedation. RFA was performed using cold perfused needles and MWSA using a single antenna at 2450 MHz and a generator working at 100-180 Watt. Cumulative overall survival curves were calculated with the Kaplan-Meyer method and differences with the log-rank test.

Results
Cumulative overall survival of the entire group was 56%, 48% and 48% at 36, 60 and 80 months, respectively. Overall survival of MWS ablated patients was better (100%, 84%, 84% and 84%, at 12, 36, 60 and 80 months, respectively) than that of RFA group (100%, 77%, 40% and 29%, at 12, 36, 60 and 80 months, respectively)(p<0.001). Likewise, patients of MWSA group survived longer than patients of RFA group either considering long term survival of patients with <3 cm nodules or >4 cm nodules. No major complications were observed during the entire period of the study.

Conclusions
High-powered MWSA of ICC is superior to RFA, achieving better long term survival either in small ICC nodules or >4 cm neoplastic tumors and should replace RFA in treating ICC.
SECOND GENERATION DIFFERENTIAL TISSUE HARMONIC IMAGING IMPROVES THE VISUALIZATION OF RENAL LESIONS

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Objective: To evaluate renal lesion visualization using second generation differential tissue harmonic imaging (DTHI-II) compared to first generation DTHI, traditional tissue harmonic imaging (THI) and fundamental grayscale ultrasound (US) imaging.

Methods: Twenty adults with a BMI>25 (range: 25-36) scheduled for US imaging of a known renal lesion were enrolled in this IRB approved study. Sagittal and transverse still images were acquired using a 6 MHz curvilinear probe on an Aplio 500 scanner (Canon Medical Systems, Tokyo, Japan). Each patient was imaged using US, THI, DTHI and DTHI-II modes, which are dual-frequency, non-linear US imaging techniques. Imaging parameters were fixed for each subject. Each imaging technique was scored by 3 independent and blinded observers on a VAS ranking of 1-7 (best-worst) ranking detail resolution, image quality, margin delineation and depth penetration. Quantitative contrast-to-noise ratios (CNR) were calculated for all imaging modes. Results were compared by reader and CNR using Wilcoxon signed rank and paired t-tests.

Results: In total 140 images were assessed. Overall results show that DTHI-II outperformed DTHI, THI and grayscale US with respect to detail resolution, image quality and margin delineation (p<0.012). The depth penetration of DTHI and DTHI-II was similar (p=0.16), but superior to US and THI (p<0.001). All 3 readers and the CNR values showed that the non-linear imaging modes were superior to grayscale US (p<0.0015). The 2 clinical observers saw improvements in detail resolution with DTHI-II over DTHI (p<0.05), while image quality and margin delineation were considered similar by 2 observers (p>0.07) and improved with DTHI-II by one (p<0.017). Similar results were obtained when comparing THI and DTHI with no statistical differences seen by 2 out of the 3 observers (p>0.12).

Conclusions: DTHI-II improves imaging of renal lesions compared to DTHI, THI and grayscale US; albeit based on a limited sample size.
EVALUATING CAROTID PLAQUE NEOVASCULARITY AND CALCIFICATIONS IN PATIENTS PRIOR TO ENDARTERECTOMY

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Objective: The objective was to use two ultrasound image and signal processing techniques (MicroPure™ and Superb microvascular imaging (SMI); Canon MedicalSystems, Tokyo, Japan) to investigate carotid plaque calcification and intraplaque neovascularity flow as biomarkers for plaque vulnerability in patients prior to endarterectomy.

Methods: Thirty subjects, with preoperative CT angiography (CTA) and scheduled for carotid endarterectomy, were enrolled in an IRB approved study. Bilateral grayscale, power Doppler, SMI and MicroPure™ imaging of the carotids were performed using an Aplio 500 Platinum scanner (Canon). MicroPure™ combines nonlinear imaging and speckle suppression to mark calcifications as white spots in a blue overlay, while SMI utilizes clutter suppression to extract microvascular flow signals. Readers counted calcifications and scored them as present or absent, while intraplaque neovascularity was scored on a 4-point scale by ultrasound as well as by pathology (as the reference). MicroPure™ and SMI assessments were compared to conventional ultrasound and CTA with pathology as the reference standard.

Results: Due to technical difficulties and cancelled operations 57 carotids were studied, while endarterectomies yielded 28 specimens. Intraplaque neovascularization was detected by SMI in significantly more plaques than by power Doppler (41 vs. 22 out of 57 examined plaques or 72% vs. 39%; p < 0.0001). There was no statistical difference between either reader compared to pathology (p > 0.37). Sensitivity, specificity, and accuracy for detecting intraplaque neovascularity based on color SMI and PDI were 84% (95% CI: 64-96%), 33% (95% CI: 1-91%), 79% (95% CI: 59-92%), and 52% (95% CI: 31-72%), 100% (95% CI: 23-100%), 57% (95% CI: 37-76%), respectively. MicroPure™ did not correlate with any measures of intraplaque flow (p > 0.13).

Conclusion: SMI may have potential for providing evidence of plaque vulnerability. MicroPure™ appears less useful in carotid applications.
INTRACAVITARY CONTRAST ENHANCED ULTRASOUND IS USEFUL DURING AND AFTER PERCUTANEOUS GALL BLADDER DRAINAGE IN PATIENTS WITH ACUTE CHOLECYSTITIS

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Objectives
Percutaneous gall bladder drainage is an evidence-based therapy for patients with acute cholecystitis which are unfit for acute surgery. Intracavitary contrast enhanced ultrasound (CEUS) is recommended in guidelines.

Methods
In more than 30 patients with acute cholecystitis which were found unfit for surgery due to severity of the current disease or their comorbidities intracavitary CEUS was performed during and after percutaneous gall bladder drainage.

Results
Percutaneous gall bladder drainage and intracavitary CEUS could be performed successfully in all patients. In few patients outlet of the contrast agent over the cystic duct could be observed. There was no difference concerning adverse events or therapy success. In 4 patients, dislocation could be demonstrated later. Decision against immediate surgery was due to severe comorbidity in most cases. The intervention led to relieve of symptoms in most cases. In only one patient there was no success. There were no severe complications. Dislodgement was diagnosed in 3 cases.

Conclusions
Intracavitary CEUS in percutaneous gall bladder drainage is effective and allows intervention control during and after the intervention. The relevant cohort are old cardiopulmonary limited patients.
A PRELIMINARY STUDY OF PARAMETRIC IMAGING WITH CONTRAST-ENHANCED ULTRASOUND TO PREDICT LUMINAL A BREAST CANCER

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Purpose:
The purpose of this study was to explore the use of parametric imaging as an imaging ensemble method to analyze breast contrast ultrasound images to diagnose or predict Luminal A breast cancer in the early stage.

Method:
189 patients with breast cancer who underwent contrast-enhanced ultrasound and obtained pathological findings before surgery were enrolled in this retrospective analysis. All angiographic images were subjected to angiographic analysis. After extracting the TIC curve of each pixel in the ROI region, the relevant parameters PI, AUC, MTT, WiR, WoR, TTP and RT in the curve are used as independent parameters for two-dimensional imaging. Each parameter is unified to between 0 and 255 gray levels to generate a parametric image gray-scale image. By transforming the index map and the palette axis, the three fluxes are superimposed to generate a parametric imaging color map. These parameters are represented by different colors, where the large value is indicated by red and the small value is blue. A parametric image is generated, and the lesion is superimposed with the lesion area of the original CEUS map to produce a translucent parameter imaging image. The first-order statistic features, GLCM features and binary texture features of the parametric imaging images were statistically analyzed. The features of the Lasso, ANOVA and t-test were used to reduce the features, and the effective features were selected and used. The SVM was used to output a probability value.

Result:
There were 46, 75, 37 and 31 breast cancer patients with Luminal A, Luminal B, HER2 + and triple-negative breast cancer, respectively. In the parametric imaging map, 92 features such as first-order statistic features, GLCM features, and binary texture features were extracted for each parameter, for a total of 644 parameter imaging features. After the dimension reduction is selected and the features of repetition or the same meaning are eliminated, three effective features are finally selected. The median values (IQR) of RT_E2, RT_Hm2 and RT_Et2 in Luminal A group were 0.1172 (0.0449), 0.7326 (0.0591) and 3.8483 (0.6494), respectively, and the demarcation values were 0.1306, 0.7018, 3.9199, RT_E2, RT_Hm2, RT_Et2 in Luminal A and The P values of the non-Luminal A groups were 0.0003, 0.0008, 0.0007, respectively. After the SVM outputs the probability value, RT_E2 has an AUC of 0.677, a sensitivity of 83.9%, a specificity of 71.7%, and an accuracy of 81.0%. The AUC, sensitivity, specificity, and accuracy of RT_Hm2 were 0.650, 77.4%, 70.3%, and 71.4%, respectively. The AUC, sensitivity, specificity, and accuracy of RT_Et2 reached 0.665, 63.6%, 69.6%, and 65.1%, respectively.

Conclusion:
Parametric imaging features, combined with time and distribution characteristics, provide more comprehensive diagnostic information and offer the possibility of predicting Luminal A breast cancer.
Keywords: Parametric imaging, Breast cancer, Contrast-enhanced ultrasound, Radiomics
Introduction. The main aim of ultrasound (US) examination of thyroid nodules is assessment of the risk of malignancy and select patients who should have a fine needle aspiration biopsy performed. European Thyroid Imaging and Reporting Data System (EU-TIRADS) showed a high sensitivity in detection of malignant thyroid nodules in adults, but its diagnostic value in children is not yet confirmed.

Methods. 45 children and young adults (aged from 1 to 21 years) with thyroid nodules were examined by US using EU-TIRADS categories. The diagnostic accuracy of five main US features (shape, margins, echogenicity, composition, echogenic foci) and vascularity of nodules by color Doppler in detection of malignancy was calculated. Postoperative morphological examination was done in all patients - in 26 patients nodules were malignant, in 19 – benign.

Results. TIRADS II category has been assigned to 8 patients (with follicular adenoma), TIRADS III – to 7 patients (with follicular adenoma), TIRADS IV – to 13 patients (2 with follicular adenoma, 1 with thyroid cyst, 8 with papillary cancer, 2 with papillary carcinoma), TIRADS V – to 17 patients (1 with ectopia of the thymus, 16 with papillary cancer). Accuracy of echogenic foci (microcalcification) in the node in diagnostics of malignancy was 82%, of ill-defined node margins – 80%, of solid node composition – 76%, of hypoechoic echogenicity of the node – 64%, of verticalization of the node – 47%, and of hypervascularization of the node – 49%.

Conclusion. EU-TIRADS has a high accuracy in differentiation of benign and malignant thyroid nodules in children. Most significant US features of malignancy in children were microcalcification, solid composition and ill-defined margins of the thyroid node.
ESTABLISHING ULTRASOUND SUPPORT IN A HOSPICE SETTING.

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This talk will present a review of the experience of establishing the provision of a sonographer led ultrasound scanning service in an adult hospice setting. Palliative care aims to reduce symptom burden and enhance quality of life for those with terminal disease. Ultrasound is a non-invasive, bedside imaging technique. It is a valuable resource that has been widely used in hospitals for many years; its usage has been slow to develop in hospices despite improvements to the cost of machines and their accessibility. It can assist clinicians with what are often difficult management decisions at a crucial point in a patient’s life when signs and symptoms may be subtle or complex.

Having witnessed firsthand the valuable service provided by Saint Francis Hospice, and noting the lack of ultrasound provision, the author approached the medical director. Following consultation of BMUS clinical governance guidelines to set protocols, the service commenced in July 2013. Establishing guidelines to ensure safe practice, to equip staff with confidence to request a scan and to inform staff when a scan would be helpful has taken time. The experience of the author and the clinical team at Saint Francis hospice demonstrates that such challenges can be overcome in this environment.

Over the course of five years, 350 scans were carried out by the author on 274 patients, with an age range of 23 to 96. Indications for scans included suspected urinary retention, DVT, and assessment of abdominal ascites or pleural fluid. A wide range of pathologies were found, from disease progression to gallstones accounting for pain.

Conclusion. Point of care ultrasound in a hospice is both challenging and rewarding. The author hopes this short presentation can encourage others to consider ways they can possibly offer support to their local hospices.
HEPATIC VEIN ARRIVAL TIME ASSESSED BY CONTRAST-ENHANCED ULTRASOUND IN THE NON-INVASIVE EVALUATION OF PORTAL HYPERTENSION

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Background and objectives: There is a growing interest in the non-invasive assessment of hepatic venous pressure gradient (HVPG) due to its invasiveness and limited accessibility. Transient elastography (TE) is the most used technique, with good results determining clinically significant portal hypertension (CSPH: HVPG≥10 mmHg), nevertheless it yields worse results with higher HVPG cut-offs (>12 mmHg: bleeding risk portal hypertension [BRPH]). Intrahepatic shunts developed in cirrhosis with portal hypertension leads to hemodynamic changes that correlate with disease severity, and are worse assessed by TE. Measurement by other techniques, such hepatic vein arrival time (HVAT), could be clinically useful.

Methods: Prospective, single-center study. Inclusion criteria: liver cirrhosis, clinical need for HVPG measurement. Exclusion criteria: prehepatic hypertension, cardiopathy. On the same day, and prior to the HVPG, ultrasound measurement (Toshiba Aplio 500, Japan) of HVAT from the cubital vein was performed (10% increase in hepatic vein signal compared to baseline after injection of contrast [Sonovue®, Bracco, Italy]). The reliability of HVAT in the prediction of CSPH and BRPH was evaluated by determining the area under receiver operating characteristic curve (AUROC) and the percentage of correctly classified patients.

Results: 56 patients were included. 6 were excluded from analysis because of poor echo window (89% applicability). In the 50 patients with HVAT (medians): 61 years, 70% male, BMI 26.6 kg/m², Child-Pugh A/B/C 70/28/2%, MELD 10, 87% varices, 14% ascites. Linear correlation (Pearson) of HPVG with HVAT: -0.55 (p<0.001). The AUROC of CSPH by HVAT was 0.94 (95%CI: 0.85-1; p=0.001) with OC of 17.1 seconds (Se 93%, Sp 66%, PPV 95%, NPV 57%). The AUROC of BRPH by HVAT was 0.8 (95%CI 0.67-0.93; p=0.001) with OC of 14 seconds (Se 82%, Sp 62%, PPV 82%, NPV 62%). The sequential use (HVAT>TE) improves the diagnostic accuracy from 90% to 92% in CSPH and from 76% to 85% in BRPH.

Conclusions: HVAT assessed by contrast-enhanced ultrasound is an excellent non-invasive method to evaluate the existence of CSPH, and good-one in the assessment of BRPH.
ATYPICAL CYST AND SOLID BREAST LESIONS DIFFERENTIATION ON ULTRASONIC IMAGES: VALUE OF MACHINE LEARNING APPROACH

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Objectives
The first part of the differentiation process for breast lesions usually involves the distinction between cystic and solid ones. At the same time complex cysts and hypoechoic solid lesions often mimic each other during the standard visual image assessment that leads to the significant drop of specificity. We tried to develop the automatic method of cystic and solid breast lesions differentiation based on the quantitative machine learning technique.

Methods
The input data were the standard ultrasound digital images of 107 cystic (including 53 atypical, difficult for bare eye differentiation) and 110 solid lesions exported from the following commercial ultrasound systems: Medison SA8000SE, Siemens X150, Esaote MyLab C. All lesions were cytologically and/or histologically confirmed. Visual identification was performed by trained specialist in breast ultrasonography. For quantitative assessment we used the software of our own design based on machine learning technique. Its outputs were the mean and maximal percent value of cyst threshold exceeding. Therefore for cysts these values were the positive ones, for solids equaled 0.

Results
Our system correctly distinguished all (107, 100%) typical cysts, 107 of 110 (97.3%) solid lesions and 50 of 53 (94.3%) atypical cysts. On the contrary, with the bare eye it was possible to identify correctly all (107, 100%) typical cysts, 96 of 110 (87.3%) solid lesions and 32 of 53 (60.4%) atypical cysts. The corresponding overall specificity values were 98% and 87%.

Conclusions
Machine learning approach surpasses the visual assessment performed by trained specialist. The difference is especially large for atypical cysts and hypoechoic solid lesions with clear margin. This data may have a clinical significance.
USEFULNESS OF INTESTINAL ULTRASOUND IN THE FOLLOW-UP OF POSTOPERATIVE RECURRENCE OF CROHN’S DISEASE

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Objectives: Postoperative Crohn’s Disease recurrence (POR) is currently assessed by ileocolonoscopy. Bowel sonography (US) is an alternative, non-invasive, non-ionising and well-tolerated diagnostic method. Our aim was to validate US, and to establish a correlation between the different ultrasound parameters of activity and Rutgeerts endoscopic score.

Methods: We selected 31 patients with Crohn’s Disease in follow-up at our unit, who had underwent surgical ileocolic resection, that required ileocolonoscopy and US for the diagnosis of POR, with a difference between both tests lesser than 6 months.

Recurrence was assessed by ileocolonoscopy using the Rutgeerts score, considering >=i2b endoscopic recurrence. The echographic findings were bowel wall thickness (BWT), hyperemia, layer pattern, involvement of the mesenteric fat, presence of adenopathy and transmural complications (fistulas and abscesess)

Results: Ileoconoloscopy detected recurrence in 16 of 31 patients (51%). A statistically significant association was identified between wall thickness and recurrence (mean 2.75 mm non recurrence vs 5.68 mm recurrence p = 0.001)

Regarding hyperemia, 86.6% (13/15) without POR had hyperemia grade 0-1/3, while 93.3% (14/15) with POR grades 2-3/3 (p=0.001). 100% of patients (14/14) without POR presented preservation of the layer pattern, while 64% (9/14) with POR modified it (p=0.001). Moreover, 100% (15/15) without POR had normal mesenteric fat, as opposed to 43.7% (7/16) with POR in which it was affected (p=0.014).

ROC curve analysis shows a BWT of 3.4 mm as the best cut-off point (SE: 100% ES: 86.6% AUC: 92%, SD: 0.05). If we only consider severe POR (i3-4) there was a 100% concordance by endoscopy and intestinal ultrasound.
Conclusions: There is a good relationship between the different echographic parameters of activity (bowel thickness, hyperemia, wall distortion...) and the presence of endoscopic recurrence, as well as the severity of the recurrence.
SHEAR-WAVE ELASTOGRAPHY FOR EVALUATION OF MEDIAN NERVE NEUROPATHY IN DIABETIC PATIENTS: A PILOT STUDY

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Objectives
The aim of this study was to validate the feasibility of shear-wave elastography (SWE) in evaluation of median nerve neuropathy in diabetic patients.

Methods
The retrospective study was approved by the Ethics Committee and written informed consent was obtained. This study included 21 diabetic patients with DPN (Group 1), 21 diabetic patients without DPN (Group 2) and 21 controls (Group 3). The cross-sectional area (CSA) of median nerves by gray-scale sonography and stiffness by SWE at the level of the mid flexor retinaculum (level A) and 4cm proximal to the mid flexor retinaculum (level B) were respectively calculated. The diagnostic capability of CSA and SWE for the diagnosis of median nerve neuropathy were analyzed.

Results
The CSA and SWE values of median nerves in Group 1 were significantly higher than those in Group 3 (P<0.001). The CSA results obtained at the two levels revealed significantly higher values in Group 1 compared with Group 2 and Group 3, but no such significant differences between Group 2 and Group 3. In Group 1, mean stiffness values were significantly higher at the level A and B compared to the Group 2 and Group 3 (P<0.01), and there was a tendency of increased nerve stiffness in the Group 2 than Group 3. CSA at the two levels had lower sensitivities of 57.14%, 76.19%, respectively. The combination of CSA and SWE indices showed a higher specificity 97.62% and 88.1% at the two levels in diagnosis of DPN.

Conclusions
The combination of CSA and SWE measurements was highly specific for predicting median nerve neuropathy in diabetic patients.
UTILITY OF ULTRASOUND IN NON-APPENDICEAL ACUTE PAIN IN THE RIGHT HEMI-ABDOMEN: A DIAGNOSTIC APPROACH

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Objectives:
To show key echographic findings for the diagnosis of acute pathology of right hemi-abdomen.
Propose an algorithm approach for the diagnosis management of these pathologies.

Methods:
We have reviewed the echographic images of patients who came to the emergency department of our hospital in the last year with pain in right hemi-abdomen, and whose non-appendiceal origin has been confirmed either surgically or with complementary exploratory tests.

Results:
Representative and characteristic images of right hypochondrium pathology (cholecystitis, hepatic abscess, biliary colic), renal fossa (renal abscess, pyelonephritis, renal colic, traumatism), right iliac fossa (ileitis, fat necrosis) and pelvis (ovarian torsion, follicular hemorrhagic cysts, pelvic inflammatory disease) were obtained.

Conclusions:
Ultrasound is a useful technique in the initial management and diagnostic approach of the acute abdominal pathology of the right hemiabdomen.
With an adequate diagnostic algorithm, unnecessary irradiation is avoided in this type of patients.
SONOGRAPHIC CHANGES OF LUMBAR MULTIFIDUS IN ATHLETES WITH AND WITHOUT LUMBOPELVIC PAIN: A PILOT STUDY

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Objectives: In recent years there has been a growing interest in the study of new techniques of ultrasound image analysis to develop new clinical options for clinical assessment and control of disorder’s progression, specially in neurology field. The aim of this study was to compare the multifidus morphometry through rehabilitative ultrasound imaging (RUSI), and gray-scale pixel’s differences between athletes with and without lumbopelvic pain (LLP).

Methods: A convenience sampling method was used to develop a case-control pilot study in 10 matched-paired athletes with LLP (n = 5; case group) and without LPP (n = 5; control group). Image J software was used to evaluate CSA (cm²) of both multifidus at L4 vertebral level in prone position during rest and sub-maximal muscle contraction by contralateral arm lift task, as well as multifidus pixel value measured in gray-scale from rest images (Mean, minimal and maximal).

Results: Statistically significant differences (P<.05) only were displayed for CSA of right multifidus during rest, showing lower scores for LPP group (5.56 ± 0.92) with respect healthy group (7.50 ± 1.03). No significant differences were found (P>.05) between both groups for quantitative and categorical descriptive data.

Conclusions: This pilot study showed a lower CSA of right multifidus at rest in athletes who suffered from LLP compared to healthy controls. Further studies with higher sample size are necessary to determine the use of ultrasound pixel analysis and morphometry as a predictive screening tool for LLP prevention in non-professionals athletes, as has been suggested in previous studies.
### Table 1 – Multifidus CSA and gray-scale pixel differences (mean, minimal and maximal) for athletes with LPP and without LPP.

<table>
<thead>
<tr>
<th>Outcome measurements</th>
<th>LPP group Mean ± SD (n = 5)</th>
<th>Healthy group Mean ± SD (n = 5)</th>
<th>P-Value LPP vs healthy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right multifidus CSA (CSA&lt;sub&gt;rest&lt;/sub&gt;) (cm&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>5.56 ± 0.92</td>
<td>7.50 ± 1.03</td>
<td>.023</td>
</tr>
<tr>
<td>Right multifidus CSA (CSA&lt;sub&gt;cont.&lt;/sub&gt;) (cm&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>6.47 ± 0.88</td>
<td>7.78 ± 1.28</td>
<td>.078</td>
</tr>
<tr>
<td>Left multifidus CSA (CSA&lt;sub&gt;rest&lt;/sub&gt;) (cm&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>6.18 ± 1.32</td>
<td>7.38 ± 1.39</td>
<td>.204</td>
</tr>
<tr>
<td>Left multifidus CSA (CSA&lt;sub&gt;cont.&lt;/sub&gt;) (cm&lt;sup&gt;2&lt;/sup&gt;)</td>
<td>6.64 ± 1.37</td>
<td>8.16 ± 1.85</td>
<td>.179</td>
</tr>
<tr>
<td>Right Multifidus mean pixel (gray-scale value)</td>
<td>68.54 ± 16.66</td>
<td>59.54 ± 19.68</td>
<td>.456</td>
</tr>
<tr>
<td>Right Multifidus minimal pixel (gray-scale value)</td>
<td>6.80 ± 7.32</td>
<td>00.00 ± 0.00</td>
<td>.107</td>
</tr>
<tr>
<td>Right Multifidus maximal pixel (gray-scale value)</td>
<td>223.20 ± 28.70</td>
<td>233.80 ± 23.08</td>
<td>.538</td>
</tr>
<tr>
<td>Left Multifidus mean pixel (gray-scale value)</td>
<td>74.92 ± 27.30</td>
<td>67.17 ± 19.85</td>
<td>.622</td>
</tr>
<tr>
<td>Left Multifidus minimal pixel (gray-scale value)</td>
<td>4.60 ± 9.20</td>
<td>7.20 ± 7.82</td>
<td>.644</td>
</tr>
<tr>
<td>Left Multifidus maximal pixel (gray-scale value)</td>
<td>214.60 ± 23.17</td>
<td>210.20 ± 42.43</td>
<td>.844</td>
</tr>
</tbody>
</table>

**Abbreviations:** LPP, lumbopelvic pain; CSA<sub>rest</sub>, cross-sectional area at rest; CSA<sub>cont.</sub>, cross-sectional area at sub-maximal muscle contraction.

* Student’s t-test for independent samples were used.

For all analyses, $P < .05$ (for a confidence interval of 95%) was considered as statistically significant (bold).
Figures

**Figure 1.** Box plot of right multifidus CSA at rest (cm²) differences for the athletes with LPP compared to healthy athletes. *Abbreviations:* LLP, lumbopelvic pain; CSA<sub>rest</sub>, cross-sectional area at rest.

**Figure 2.** Image J software measurements of the right multifidus muscle CSA and histogram of pixel intensity measured in gray-scale. *Abbreviations:* CSA, cross-sectional area.
Oral presentations
PROSPECTIVE MULTI-CENTER VALIDATION OF CEUS LI-RADS: PRELIMINARY RESULTS

Dr. Andrej Lyshchik1, Dr. Yuko Kono2, Dr. Fabio Piscaglia3, Dr. Shuchi Rodgers4, Dr. Geoffrey Wile7, Dr. Aya Kamaya6, Dr. Alexandra Medellin5, Dr. Lisa Finch8, Dr. Stephanie Wilson5

1Thomas Jefferson University Hospital, Philadelphia, United States, 2University of California, San Diego, San Diego, United States, 3University of Bologna, Bologna, Italy, 4Einstein Medical Center, Philadelphia, United States, 5University of Calgary, Calgary, Canada, 6Stanford University, Stanford, United States, 7Vanderbilt University, Nashville, United States, 8Swedish Medical Center, Seattle, United States

Objectives
The American College of Radiology Contrast-Enhanced Ultrasound Liver Imaging Reporting and Data System (CEUS LI-RADS) is developed to classify focal liver observations in patients at risk of HCC. The aim of this prospective multicenter study is to validate the CEUS LI-RADS.

Methods
A total of 241 nodules from 226 patients at risk of HCC are included in this ongoing study conducted at 8 centers (6 in the USA, 1 in Canada and 1 in Italy). Focal liver observations are classified as LR-5, (definitely HCC) if ≥1 cm with arterial phase hyperenhancement, and late, mild washout. Rim enhancement and/or early washout and/or marked washout qualify as LR-M (malignant, but not specific for HCC). Other observations are classified as definitely benign (LR-1); probably benign (LR-2), intermediate malignancy probability (LR-3); probably HCC (LR-4). Tumor-in-Vein is characterized as LR-TIV. Definite HCC diagnosis on MRI, imaging follow-up or histology for MRI-indeterminate observations were used as reference standard.

Results
The median focal liver observation size is 2.4 cm. Of 241 nodules, 154 (64%) have confirmed diagnosis while 87 (36%) nodules remain indeterminate, currently undergoing imaging surveillance or awaiting histological confirmation. Of 154 confirmed nodules, 127 are HCC (82%), 5 (3%) other malignancies (2 ICC, 1 combined hepatocellular-cholangiocarcinoma, 2 metastasis) and 22 (15%) are benign.

A total of 81 confirmed observations are characterized as LR-5 and 100% of them are HCC. The sensitivity of LR-5 for HCC is 64%. All 8 LR-1 and LR-2 observations are benign. All 9 LR-M observations are malignant (5 HCC, 2 metastasis, 2 ICC). 60% (12/20) of LR-3 observations and 86% (24/28) of LR-4 observations are HCC. 5% of nodules are not characterized on CEUS (LR-NC).

Conclusions
The CEUS LR-5 and LR-TIV classification is 100% specific for HCC, confirming high clinical value of CEUS for noninvasive HCC diagnosis.
A FIRST CONTRAST ENHANCED ULTRASONOGRAPHY (CEUS) STUDY ON HEMOPHILIA ARTHROPATHY SHOWING MORE SENSITIVITY IN DETECTING SYNOVIAL VASCULARITY AND HYPERTROPHY THAN CONVENTIONAL GRAY SCALE ULTRASONOGRAPHY (CUS) AND COLOR DOPPLER FLOW IMAGE (CDFI)

Dr. Fei Ma¹, Dr. Jing Sun¹, Dr. K.H. Luke², Dr. Yaru Zhang¹, Dr. Hao Liu¹, Dr. Shiyu Zhang¹, Dr. Liling Xiao³, Dr. Wanxian Luo¹, Dr. Li Zhang¹, Dr. Weizhen Wang¹, Dr. Shiqiu Qiu¹, Dr. Yingjia Li¹
¹Nanfang Hospital, Southern Medical University, Guangzhou, China, ²Children Hospital of Eastern Ontario, Ottawa, Canada, ³The Second People’s Hospital of Shenzhen, Department of ultrasound, Shenzhen, China

**Background:** CEUS showed more sensitive in detecting synovial vascularity and hypertrophy in Rheumatoid arthritis studies, but no study in Hemophilia.

**Objectives:** To conduct a first CEUS study on hemophilia comparing to CUS and CDFI.

**Methods:** Between August 1, 2016 to January 31, 2017 all severe Hemophilia A patients referred for ultrasound joint assessments were enrolled. A CUS and CDFI done at baseline. Patients showing synovial hypertrophy were requested for a CEUS same day. CUS and CDFI by Orhndorf S and CEUS (SenoVue) by Klauzer AS (Ultrashall Med 2011.32 suppl 2, E38-44 and E 31-37)

**Results:** 81 severe A patients enrolled. 68 showing synovial hypertrophy and 46 of them consented for CEUS same day. Paired CDFI and CEUS collected on 27 knees, 9 ankles, and 10 elbows

<table>
<thead>
<tr>
<th>Scores</th>
<th># of joints by CDFI</th>
<th>Paired scores by CEUS</th>
<th># of joints by CEUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7</td>
<td>1 1 0 0 1</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>0 7 2 10 13</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>0 4 8 6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>0 0 8 26</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>scores of 46 joints</td>
<td>67</td>
<td>103</td>
</tr>
</tbody>
</table>

CEUS showed blood flow signal in 45 joints (98%) vs 39 (84%) by CDFI, significant higher vascular scores in 26 joints (Z 3.781 P<0.001) and 51% higher total vascular scores on 46 joints 103 vs 67, besides, thicker synovial measurement mean 0.53 cm vs 0.39 cm by CUS and CDFI.

No adverse effects reported

**Conclusions:** CEUS is a safe more sensitive test in detecting synovial vascularity and hypertrophy for hemophilia joint assessments and clinical studies.
IMPACTS OF INTUBATION AND POSITIVE PRESSURE VENTILATION ON CAROTID FLOW TIME AND CAROTID BLOOD FLOW

Dr. Jessica Schleifer¹, Dr. Jorge Short Apellaniz³, Dr. / PhD Michael A. Loesche², Dr. Carolyn J. Mehaffey², Mr. Daniel Ratanski⁴, Dr. Hamid Shokoohi², Dr. Andrew S. Liteplo²

¹University Hospital Bonn, Bonn, Germany, ²Massachusetts General Hospital, Boston, USA, ³Hospital Universitario Fundación Jiménez Díaz, Madrid, Spain, ⁴Northeastern University, Boston, USA

Objectives
Carotid Flow Time (CFT) and Carotid Blood Flow (CBF) are two ultrasound-based measurements used to assess fluid responsiveness. Study cohorts often combine ventilated and non-ventilated patients. We investigated the impacts of intubation and positive pressure ventilation on CFT and CBF.

Methods
Patients having cardiac surgery at Massachusetts General Hospital were prospectively enrolled. Patients with severe mitral and aortic valve pathology and those with carotid stenosis were excluded. Carotid ultrasound was performed before and after intubation. The maximum carotid diameter was measured in transverse at the level of the thyroid gland. To measure CBF and CFT, a sagittal carotid view was obtained with PW-Doppler at a minimum angle of 60° and gate size covering the whole vessel. Corrected CFT (cCFT) was calculated with the Bazett formula. CBF was automatically calculated with TAMEAN x diameter x 60. Respectively minimal detectable differences with 80% power were 159.6 ml/min CBF and 35ms cCFT.

Results
24 patients were enrolled, of which 20 patients could be used for analysis. They were predominantly male (85%), and white (90%). Average age was 59.9 (± 17.9) years old, BMI was 27.2 (± 3.7), ASA score was 3.3 (± 0.7), and ejection fraction was 57% (± 9). We found no statistically significant differences between CBF (487 vs. 447 ml/min, p=0.23) or cCFT (328 vs. 336ms, p=0.49) before and after intubation. PEEP and Pmax were not correlated with a change in CBF or cCFT.

Conclusion
Intubation and positive pressure ventilation did not affect CBF or cCFT as measured by ultrasound in this small observational study of patients undergoing anesthesia for planned surgery. Additional research would be needed if findings were to be extrapolated to other patient populations.
SONO4STUDENTS AS A STUDENT INITIATIVE FOR SONOGRAPHY TEACHING

Dr. Florian Recker\textsuperscript{1,2,3}, Ms. Julia Schreiner\textsuperscript{1}, Mr. Maximilian Wehner\textsuperscript{1}, Ms. Clara Geerling\textsuperscript{1}, Dr. Eva Weber\textsuperscript{1,2,3}

\textsuperscript{1}University Hospital Bonn, Bonn, Germany, \textsuperscript{2}Department for Obstetrics and Gynecology, Bonn, Germany, \textsuperscript{3}Department for Medical Education, Bonn, Germany

Objectives
Sono4Students is a working group which has made itself the mission to train medical students in the basics of ultrasound examination. In Bonn as in many other German universities ultrasound is not implemented in the medical curriculum. Out of necessity, the group was founded in 2010 in which students joined together to close this gap.

Methods & Results
Today it is Germany's largest student initiative in peer-to-peer-teaching sonography. Since its start in the winter term of 2010, there were established more than 8 courses offered on regular basis with more than 900 participants. The students are offered various specific courses, which focus on exam related issues and clinical practice in a structured and standardized course concept.

Each course includes a basic theory of the specific topic and a special practical course part such like FAST, abdomen sections with a total scan, thyroid & neck, abdominal vessels, lung ultrasound or introduction into duplex sonography.

Our evaluation results show how enthusiastic the students are of this course concept. With an overall assessment of all courses with a grade of 1.14 and a very low standard deviation of 0.08 it is one of the best clinical courses.

Conclusions
In addition, national and international cooperations between Sono4Students and DEGUM or other student sonography teams have emerged. Furthermore, the development of our own teaching materials and e-learning platforms in cooperation with AMBOSS was made possible.

Our course design is innovative, future-oriented and transferable to other medical curricular and it is peer - to - peer teaching suitable.
EMERGING TECHNIQUES OF ULTRASONIC BIOREACTORS FOR SOFT TISSUE CHARACTERIZATION

Dr. Juan Melchor¹,²,³, Dr. Guillermo Rus¹,²,³, Mr. Manuel Hurtado¹, Dr. Elena López-Ruiz²,³,⁴,⁵, Mr. Juan Soto⁶, Dr. Gema Jiménez²,³,⁴,⁵, Mr. Antonio Callejas¹,², Mrs. Inas Faris¹,², Dr. Macarena Perán²,³,⁴,⁵, Dr. Juan Antonio Marchal²,³,⁴,⁵

¹Department of Structural Mechanics, University of Granada, Granada, Spain, ²Instituto de Investigación Biosanitaria, ibs.GRANADA, Granada, Spain, ³Excellence Research Unit “ModelingNature” (MNat), Granada, Spain, ⁴Biopathology and Regenerative Medicine Institute (IBIMER), Centre for Biomedical Research., Granada, Spain, ⁵Department of Human Anatomy and Embryology, Faculty of Medicine, University of Granada., Granada, Spain, ⁶Department of Optics, Faculty of Physical Sciences, Complutense University of Madrid, Madrid, Spain

Objectives. The use of the rational principles of the mechanics of solids is proposed to understand and control the characterization and interaction of tissues through ultrasonic propagation to generate diagnostic techniques of pathological processes that manifest themselves in changes of tissue consistency. This multidisciplinary work will allow a better understanding of the structural and mechanical functioning of the tissues.

Methods. To quantify the variations of the mechanical properties, the inverse problem based on models is proposed to reconstruct the linear and nonlinear mechanical properties from the measurement of the ultrasonic waves as it propagates through the tissue and interacts with it. Ultrasounds are ideally sensitive to mechanical properties. The application areas are focused on (1) computationally modeling the ultrasound-tissue interaction, focusing on the constitutive models, (2) designing and testing transducers and measurement devices, (3) designing and applying a robust algorithm to reconstruct the relevant mechanical parameters from the measured signals, (4) explore the physiological, histological and biochemical variables to provide a rational view of the clinical processes and (5) designing of bioreactors to monitor the biological processes and contribute to the approach of biomedical aims and challenges.

Results. Wave velocity and attenuation are some of the parameters that results from this process, they indirectly determine histological parameters non-invasively in real time. There is a correlation among velocity, attenuation and the development of the culture.

Conclusions. So, to conclude, the usefulness of this technology in the field of regenerative medicine appears promising. Ongoing works will propose a biologically plausible explanation of the changes in the culture taking into account more medical information such as a genetic profile analysis.
ENDOSCOPIC LYMPHOSONOGRAPHY OF SENTINEL LYMPH NODES IN ESOPHAGEAL CANCER USING SONAZOID: INITIAL FINDINGS

Dr. Srijantra Gummadi¹, Dr. David Loren¹, Dr. John Eisenbrey³, Dr. Thomas Kowalski¹, Dr. Flemming Forsberg¹, Dr. Ji-Bin Liu¹
¹Thomas Jefferson University, Philadelphia, United States

Objectives
To evaluate the performance of endoscopic lymphosonography guided fine needle aspiration (FNA) of sentinel lymph nodes (SLNs) compared with endoscopic ultrasound (EUS) FNA for nodal staging in esophageal cancer.

Methods
In this ongoing, IRB- and FDA-approved pilot trial, patients with a diagnosis of esophageal cancer underwent staging EUS (standard-of-care) and endoscopic lymphosonography using a Prosound F75 ultrasound scanner (Hitachi Medical Systems, Tokyo, Japan) equipped with pulse inversion harmonic contrast imaging software. EUS was performed using a GF-UCT180 curvilinear ultrasound endoscope (Olympus, Tokyo, Japan). In this study, Sonazoid (GE Healthcare, Oslo, Norway) was injected in the submucosal plane peri-tumorally under EUS guidance and all enhancing SLNs underwent FNA. Standard-of-care FNA was performed on all suspicious lymph nodes considered significant for management. Performance of each modality was compared against patient’s lymph node staging after review by medical oncology. Additionally, the number of nodes recommended for FNA by each modality was compared.

Results
To date, 5 patients with lower esophageal T3 lesions (2 adenocarcinoma and 3 squamous cell carcinoma) have participated in this study. No adverse events were encountered following peri-tumoral Sonazoid administration under EUS guidance. Endoscopic lymphosonography resulted in a sensitivity and specificity of 66% and 100%, respectively, in correctly characterizing patient nodal status. EUS-FNA resulted in the same sensitivity and specificity of 66% and 100%. However, endoscopic lymphosonography triggered a mean of 1.2 ± 0.84 lymph node aspirates per patient, while EUS triggered a mean of 1.6 ± 0.89 lymph node aspirates per patient. When considering all nodes on EUS that demonstrated biopsy criteria, EUS predicted a mean of 3.8 ± 5.22 lymph node aspirates per patient (p=0.3).

Conclusions
Preliminary results indicate that endoscopic lymphosonography of SLNs performs similarly to EUS for recognition of overall nodal involvement in esophageal cancer but requires less nodal sampling by identifying the sentinel nodes.
REAL-TIME SHARE WAVE ELASTOMETRY IN THIN LAYERS: DERMIS, PENILE TUNICA ALBUGINEA, COLON WALL.

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¹Institute of elastography, Kyiv, Ukraine, ²Medical center "Doctor Vera", Kyiv, Ukraine

The physics of the lateral share waves (SW) during 2 dimensional elastography (2DSWEg) allows them to propagate in the perpendicular direction to the ultrasound (US) excitation beam. Purpose was evaluation of the possibility real-time 2DSW elastometry (RT 2DSWEm) of thin layers of the dermis, tunica albuginea of the corporis cavernosus (TA CC), colon wall and elastophantom.

Materials and methods. An elastophantom with a thin layer of semolina of high stiffness 2 mm was placed on top of a thick layer of lower stiffness 10 cm. RT 2DSWEm of thin layers of phantom (12 series) , dermis (18 subjects), penile TA CC (26 subjects), colon wall (15 subjects) was performed. Linear 5-14 MHz probe used by US machine Soneus P7 (Ultrasign, Ukraine ). Probe with "gel' pillow" was superimposed on the objects surface strictly perpendicular, avoiding the precompression and “dead zone” of elastography.

Results: The phantom stiffness of a thin layer (M±SD) 13.9 ± 5.3 kPa and the underlying thick layer 6.7 ± 0.8 kPa were obtained. The cheek dermis thickness was: on right 1.8±0.3, on left 1.9±0.4 mm and stiffness was: on right 10.8±0.9 and left 10,4±1,2 kPa, (p>0.05). The TA CC thickness was: on right 1.9±0.5, on left 2.0±0.5 mm, stiffness at rest was: on right CC - 17.8±6.9 and left CC - 18,0±7,1 kPa (p>0.05).

The stiffness of the anterior colon wall (sigma) was successfully measured only in 13 volunteers.They thickness was 2.1±0.5 mm and stiffness - 33.8±9.3 kPa.

Conclusions: Real-time mode of the elastometry to control the “gel pillow” avoid precompression and "dead zone". The lateral SW propagation allows the possibility of physically correct elastometry in thin parallel layers of some organs.
VALUE OF DOPPLER ULTRASOUND IN THE DIAGNOSIS OF DIALYSIS FISTULA-RELATED VASCULAR COMPLICATIONS AND IN THE QUALIFICATION PATIENTS FOR ENDOVASCULAR TREATMENT.

Dr. Anna Drelich-Zbroja¹, Dr Maryla Kuczyńska¹, Dr Michał Sojka¹, Dr Łukasz Światłowski¹, Dr Ewa Kuklik¹, Dr Krzysztof Pyra¹, Dr Jan Sobstyl¹, Prof Tomasz Jargiełło¹
¹Department of Interventional Radiology and Neuroradiology, Medical University In Lublin, Lublin, Poland

Objectives: The aim of this study was to assess the value of doppler ultrasound in the diagnosis of vascular complications of arteriovenous (AV) fistulae in dialysis patients and in the qualification patients for endovascular treatment.

Methods: 79 patients were referred during 12-month period for the ultrasound examination of the AV dialysis fistulae. There were distinguished two types of anastomoses within the group of examined patients. 46 subjects presented with end-to-side fistulae, whereas the remaining patients had side-to-side anastomoses. All dialysis fistulae were localized in the distal part of the forearm. Each examination was performed using LOGIQ 7, GE ultrasound scanner with 6-12 MHz linear probe. In every patient, who was qualified for endovascular treatment, after procedure control usg exam was performed.

Results: 21 cases of vascular complications were diagnosed among the study group including: 4 cephalic vein thromboses, 5 cephalic vein stenoses, 4 radial artery stenoses and 8 cases of the steal syndrome. All the patients diagnosed with either venous or arterial stenosis based on ultrasound examination were further qualified for PTA procedures. After procedures control ultrasound exam confirmed the good results of endovascular treatment in every patient.

Conclusions: Doppler ultrasound examination is the method of choice in the monitoring and diagnosing vascular complications of dialysis fistulas and for qualification patients for endovascular treatment of complications. Doppler ultrasound is a method of choice in monitoring patients after endovascular procedures.
AUTOMATED MACHINE LEARNING FOR SONOGRAPHIC STRATIFICATION OF HIGH AND LOW RISK THYROID LESIONS

Dr. Sriharsha Gummadi¹, Kelly Daniels¹, Dr. Ziyin Zhu², Mr. Shou Wang¹, Ms. Jena Patel¹, Dr. Brian Swendseid¹, Dr. Andrej Lyshchik³, Dr. Joseph Curry¹, Dr. Elizabeth Cotrill¹, Dr. John Eisenbrey¹
¹Thomas Jefferson University, Philadelphia, United States, ²Beijing Friendship Hospital, Beijing, China

Objective
To evaluate the role of automated machine learning in stratifying high and low risk thyroid lesions by ultrasound using next generation sequencing (NGS) detection of mutations as the reference standard.

Methods
This IRB approved retrospective study polled patients with thyroid nodules that underwent fine needle aspiration with NGS (using an internally validated 23-gene panel) for stratification between 2015 and 2018. Only patients with ultrasound images available within 6 months of sequencing were included. B-mode images considered diagnostic by a blinded board-certified radiologist of each examined lesion were extracted, resulting in total of 683 images among 134 lesions and 121 patients. Lesions were considered high-risk if they contained a mutation with a known risk for malignancy. Lesions were considered low-risk if they contained no high-risk mutations. Automated machine learning was performed using commercial software Cloud AutoML Vision™ (Google LLC, Mountain View, CA). Model performance was evaluated based on its ability to classify lesions based on a single image into high or low risk nodules.

Results
Using NGS stratification criteria, 228 images representing 43 lesions were classified as high risk and 455 images representing 91 lesions were classified low risk for analysis. After utilizing 81.4% (556) of the images for training and 10.8% of the images for internal hyperparameter optimization, an overall accuracy of 77.4% for genetic risk stratification was observed in the test group consisting of 53 images (the remaining 7.8%). A positive predictive value and negative predictive value of 90% and 74.4% was found. Additionally, while sensitivity was reported low at 45%, specificity for high-risk genetic status was 97%.

Conclusions
Early results suggest that automated machine learning can be used to assist in the sonographic identification of thyroid lesions that are likely to be high risk by NGS.
ANATOMICAL VARIANTS OF ACHILLES TENDON INSERTION (ACHTI) AND ITS RADIOLOGIC AND CLINICAL RELEVANCES

Dr. Ivan Quiros

Objectives:
Multimodal review (MRI, TEM, X rays and Ultrasound) during 18 months and more than 1200 cases let present for first time a Table with the Achilles tendon insertion (AchTi) variants.

Methods: post-review.

The review of the mechanics, physics and physiopathology explain many of the orthopaedical diseases or issues from this insertion (enthesis) and its nearest tissues.

Results: There are mainly 05 types of AchTi and its more often clinical and pathological consequences. Type 1: Normal o physiologic. Type 2: Lower. Type 3: Step mode. Type 4: Direct/Upper. Type 05: Massive mode.

Conclusions: This classification of AchTi, could have an important clue in radiologic evaluation, in orthopedics and clinical treatments; and on shoes and sport shoes industries.
BREAST CARCINOMA - A CLINICAL, MULTIMODAL SONOGRAPHIC AND PATHOLOGICAL CORRELATION

Prof. Viorela Enachescu¹, Dr. Liliana Tanasoiu², Dr.Dragos Camen³, Dr. Georgiana Camen¹, Prof. Relu Stanescu¹

¹University of Medicine and Pharmacy, Craiova, Romania, ²Oncology Dept. Slatina County Hospital, Slatina, Romania, ³Medical Clinic Dr. Camen, Craiova, Romania

A retrospective study was performed to define the relationship between clinical, multimodal sonographic features, and histology, in patients with breast lesions.

Material and method. Consecutive retrospective series of 83 female and 2 male, aged 22-82 years, average age 52 years, with 85 punctioned/operated singular focal breast lesion. The criteria for inclusion were clinically suspect or painful, palpable nodule on physical examination, two independent ultrasound observers - 2D US, color/power Doppler, Sie-scape, Strain Elastography, blind control mammography, histology.

Results. Sonomorphologic analysis of malignant tumors indicated: blurred, irregular contours, retrotumoral acoustic effect, strong nonhomogenous echostructure, hypo-echogenicity, firmly palpable probe features, longitudinal axis perpendicularly on the skin, peritumoral invasion. Doppler analysis showed: intense/poor vascularity, chaotic distribution of blood vessels, irregular changing diameters, serpentine course, increased irregularity toward the center of the tumor or vascular signals up to 10-30 % of the malignant area. Quantitative Doppler parameters were: RI 0.49-1.09; PI 0.69-3.11 with no significant difference. There was a better correlation between conventional ultrasound criteria - hypoecogenicity, long axis, contours vs histology in malignant tumors and elastography vs histology in benign lesions. Histopathologic analysis showed: fibroadenomas – 38 cases (3 - hypervascular similar to a malignant lesion); - 34 cases malignant tumors (8 - ductal, 12 - papilar, 6 - lobular, 1 - medular, 3 - infiltrative – 1 – colloid - 3 local recurrenc tumors); 13 different benign tumors.

Conclusions. Ultrasound offered a good pre-interventional assessment of the breast lesions. This knowledge may provide more accurate information to the surgeon after performing the ultrasound. There was a good correlation between ultrasound findings, including elastography and histology in benign lesions, but a better correlation between conventional US and histology relative to elastography vs histology in malignant lesions.
PERFORMANCE STUDY OF TRANSURETHRAL SHEAR WAVE ELASTOGRAPHY SENSOR IN PROSTATE-LIKE GELATINE PHANTOMS

Mrs. Beatriz Blanco¹, Dr. Antonio Gómez²³, Mrs Inas H.Faris¹², Mr Antonio Callejas¹², Mr Jorge Torres¹, Dr Juan Melchor¹²⁴, Dr. Nader Saffari³, Dr. Guillermo Rus¹²⁴
¹University of Granada, , Spain, ²Instituto de Investigación Biosanitaria (ibs.GRANADA), , Spain, ³University College London, , United Kingdom, ⁴Excellence Research Unit “ModelingNature” (Mnat), Universidad de Granada, , Spain

Objectives
A novel Transurethral Shear Wave Elastography (TU-SWE) sensor was designed to characterize mechanical properties of prostate tissues is presented in this work. Elastography is a widely used technique since the 1990s to map tissue stiffness. Moreover, quantitative elastography uses the velocity of shear waves to achieve the shear stiffness. This technique exhibits significant limitations caused by the difficulty of the separation between longitudinal and shear waves and the pressure applied while measuring. To overcome these drawbacks, the proposed TU-SWE sensor isolate a pure shear wave, avoiding the possibility of multiple wave interference. It comprises a rotational actuator disk and four piezoceramic receivers circumferentially aligned. Both allow the transmission of shear waves that interact with the tissue before being received. The main objective of this work was the validation of the TU-SWE sensor developed by our group in prostate-like gelatine phantoms.

Methods
The proposed methodology consists of two parts: 1) a experimental setup to obtain shear wave stiffness in prostate-like gelatine phantoms with the proposed transducer and 2) Verasonics dispersion curve obtention for validation. The variables object of the study are both the applied suction pressure and the distance of emisor and receivers within phantom. A series of phantoms were tested at different gelatine concentrations (from 7,5% to 15%), frequencies (from 0,5 to 1.2 kHz), suction pressures (from 0 to 10 kPa) and emisor-receivers distances (from 0 to 10 mm).

Results
a) A carefully calibration is required for compensating electromechanical cross-talk of the TU-SWE probe.

b) Verasonics calibration curves are compatible with TU-SWE shear wave speed measurements.

c) Experimental results show that the applied suction pressure and the emisor-receivers distance does not influence the shear wave stiffness measurements.

Conclusions
Preliminary results indicate that the proposed transducer successfully allows the reconstruction of the mechanical constants from the propagated shear wave.
CERVICAL ELASTOGRAPHY BY TORSIONAL WAVES FOR GESTATIONAL DISORDERS DIAGNOSIS

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Objectives
The WHO estimates that in 2017 approximately 15 million babies will be born preterm, this is, a rate above 1 in 10 newborns. Worldwide, complications of preterm births have supplanted pneumonia as the primary cause of child mortality. Currently, there is no clinical tool to quantitatively evaluate the cervical biomechanical state. Towards this problem, we work on enabling new sensor technologies linked to soft tissue biomechanics, to endow a new class of biomarkers that quantify the mechanical functionality of the cervix, and indeed any soft tissue.

Methods
Existing ultrasonic techniques are restricted to map first order tissue stiffness. In contrast, our recent advances covering (a) torsional waves, (b) sensors, (c) propagation models and (d) patient testing, are allowing to quantify the mechanical functionality through relevant parameters beyond linear: dispersive and nonlinear. These higher order mechanical parameters may become key discriminating biomarkers since: (1) the physics of wave propagation is explaining how dispersion is a compound expression of the rheological, poroelastic, and microstructural scattering phenomena governed by the complex fibrous multiscale microarchitecture of the stroma, which undergoes characteristic changes during pathologies; and (2) the extreme hyperelasticity that soft tissue exhibits clearly manifests as quantifiable harmonic generation, hypothesized to strongly depend on the unfolding of its collagen fibers, which again controls the tissue’s mechanical functionality.

Results
a) To understand how the structural architecture of soft tissue is intimately linked and controls a broad range of pathologies
b) To develop new sensor technologies capable of effectively sensing tissue elasticity and yield simple and robust diagnostic tests and instruments.

Conclusions
As a conclusion, this work has enabled to ground a new generation of biomarkers of physical nature based on the mechanical micro-architecture and properties of the tissue.
PROBABILISTIC INVERSE PROBLEM TO CHARACTERIZE CERVICAL TISSUE MECHANICAL PROPERTIES

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Objectives
The preterm birth is the main cause of infant mortality and morbidity and evaluating the viscoelastic mechanical parameter changes during pregnancy is a pressing need for obstetricians as a potential preterm birth prevention tool, as well as a challenging problem. The increasing interest in elastography techniques for measuring viscoelastic parameters in cervical tissue is demanding appropriate viscoelastic models. Regarding the torsional wave elastography technique employed in this work, since torsional waves propagate through the surface and in depth tissue, there is a need for understanding cervical tissue behavior considering multilayer models. To this purpose, three different viscoelastic models have been proposed in which epithelial and connective layers were considered.

![Figure 1: cervix micrography versus two dimensional finite difference time domain scheme (left), 2D FDTD model simulation at 0.9 milliseconds using the Kelvin-Voigt model (right).](image)

Methods
The proposed methodology for selecting the most plausible model that reconstruct the cervical tissue viscoelastic parameters consists of four steps: (1) an idealization of the nature of the cervical tissue with three viscoelastic models (elastic, Kelvin-Voigt and Maxwell model) (Figure 1); (2) a finite difference time domain numerical model in cylindrical coordinates which simulates torsional wave propagation through a bilayer cervical tissue is implemented (Figure 1); (3) a study in pregnant women to obtain experimental signals from cervical tissue using the torsional wave probe is presented; finally (4) the plausibility of each rheological model is found by applying a probabilistic inverse problem and the reconstruction of cervical tissue viscoelastic parameters is performed by using the selected rheological model.

Results and Conclusions
It is shown that the rheological model that best describes the nature of cervical tissue is the Kelvin Voigt model. The reconstructed viscoelastic parameters, using the selected model are: \( \mu_{\text{epithelial}} = 1.9 \text{ kPa}, \eta_{\text{epithelial}} = 0.27 \text{ Pa s}, \theta_{\text{epithelial}} = 0.51 \text{ mm}, \mu_{\text{connective}} = 7.9 \text{ kPa}, \eta_{\text{connective}} = 0.13 \text{ Pa s}. \) To our knowledge, there are no references to allow comparison with the results obtained in the epithelial and connective layer of cervical tissue. In the literature there is only one reference of the thickness of the vaginal epithelium, whose values are close to those inferred in this study.
VENOUS THROMBOSIS OF THE PANCREATIC GRAFT: ROLE OF CONTRAST ENHANCED ULTRASOUND (CEUS)

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Objectives:
Venous thrombosis is the main non-immunological cause of pancreatic graft failure in the early postoperative period. Close monitoring and early diagnosis is crucial in the management. Color-Doppler-Ultrasoundography (CDUS) is the primary imaging technique for monitoring vascular patency after pancreas transplantation. The low flow in the splenic vein together with the suboptimal Doppler angle (because of the anatomical position) makes it sometimes difficult to ensure vein permeability and to diagnose hypoechoic thrombus. The objective of our study is to determine the value of Contrast Enhanced Ultrasound (CEUS) in the diagnosis of acute hypoechoic venous thrombus in the pancreatic transplant.

Methods:
Retrospective study including all pancreatic transplants performed in our center between January 2008 and January 2019 (190 patients). Our protocol included gray-scale ultrasound and CDUS during the first days after transplantation, in order to assess the graft veins permeability. CEUS was performed when no flow was detected by CDUS in the splenic/mesenteric graft veins and thrombus was not identified using gray-scale US (hypoechoic thrombus suspicion).

Results:
Gray-scale US detected venous thrombosis in 29 patients. In other 21 patients CEUS was performed (no thrombus in gray-scale and no flow in CDUS). In 11/21 CEUS demonstrated low-flow vein permeability. In 10/21 CEUS detected venous thrombosis (7 splenic, 1 mesenteric and 2 splenic and mesenteric thrombosis). The diagnosis was confirmed in 6/10 patients by arteriography and in 2/10 during surgery. In 2/10 patients arteriography was not performed because the thrombus was distal and small.

Conclusions:
CEUS can well differentiate between low-flow permeability and venous thrombosis when there is no Doppler signal in the veins of the pancreatic graft. CEUS can be performed at the same moment of US study, avoiding delay in the diagnosis, realization of more invasive techniques or even requirement of iodinate contrast (in patients which frequently have simultaneously received a renal transplant).
VALUE OF VISCOSITY, VISCOELASTICITY AND ATTENUATION MEASUREMENT USING SHEAR WAVE ULTRASOUND ELASTOGRAPHY

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Objectives: To evaluate the usefulness of Two-Dimensional Shear Wave Elastography (2D-SWE), Dispersion Index (DI) and Attenuation Index (ATI) measurements obtained using Aplio i800 from Canon, for the noninvasive assessment of liver fibrosis, inflammation, and steatosis using Transient Elastography (TE) with Controlled Attenuation Parameter (CAP) as the reference method.

Methods: 113 consecutive subjects were included, mostly NAFLD patients, in whom liver stiffness (LS) and steatosis were evaluated in the same session by means of 2 elastography techniques: TE with CAP (FibroScan, EchoSens) and 2D-SWE with ATI (Aplio i800, Canon). Reliable LS measurements were defined for TE as the median value of 10 measurements with an IQR/M<30% and for 2D-SWE the median value of 5 measurements in a homogeneous area of liver parenchyma, with an IQR/M<30%. Dispersion was also assessed with the Aplio system.

To discriminate between TE fibrosis stages we used the following cut-off values: F≥2: 8.4 kPa and F4: 13.2 kPa and for discrimination of steatosis stages the cut-offs recommended by the manufacturer: S1 (mild) – 230dB/m, S2 (moderate) – 275dB/m, S3 (severe) – 300dB/m.

Results: Reliable LS measurements were obtained in 99.1% of subjects by both 2D-SWE and TE. A very strong positive correlation was found between LS values: r=0.88, p<0.0001 and between the attenuation coefficients of steatosis: r=0.81, p<0.0001 obtained by the 2 methods.

The best cut-off values for fibrosis were F0/1 ≤ 6.2 kPa (AUROC 0.82; Se=75%; Sp=85.5%), F2: 7.9 kPa (AUROC 0.96; Se=90.4%; Sp=95.6%), F4: 11.7 kPa (AUROC 0.99; Se=100%; Sp=96%). Regarding steatosis, the best cut-off values were: S1=0.64 dB/cm/mHz (AUROC 0.89; Se=73.6%; Sp=88.8%), S2=0.79 dB/cm/mHz (AUROC 0.88; Se=63.4%; Sp=96.4%), S3=0.86 dB/cm/mHz (AUROC 0.95; Se=45%; Sp=100%). After dividing the cohort into healthy vs patients with chronic hepatopathies we obtained mean DI values higher in the pathology group versus healthy group (12.4±2.7 vs 11.5±1.9, p=0.03)

Conclusions: 2D-SWE and ATI measurements with the new system strongly correlate with TE and CAP results.
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FUNCTIONAL ULTRASOUND FOR DIAGNOSIS BLADDER NECK MOTILITY IN MEN

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Objectives.
Lower urinary tract symptoms (LUTS) is a widespread problem in men affecting life quality. Benign Prostatic Hyperplasia (BPH) might be overestimated as the only cause of LUTS. Functional ultrasound (US) has strong potential for to evaluate pelvic floor disorders.

The aim was to evaluate the feasibility and reliability of transabdominal US bladder neck motility in men.

Materials and methods.
We included 112 male patients (38–92 years) with LUTS; healthy subjects of group 2 (n = 30) were controls. All individuals underwent general examination, pelvic US with transabdominal evaluation of proximal urethra (prostate / bladder neck) motility measuring posteroinferior rotation at rest and on maximal Valsalva and prostate volume. Among group 1 we distinguished group 1a patients with increasing deviation at maximal Valsalva >45 mm (empirically established threshold; n=33); the rest were included to 1b group.

Results.
The bladder neck posteroinferior rotation at maximal Valsalva on transabdominal US was 86±17 mm (65-120 mm) in group 1a vs 37 ± 12 mm and 27 ± 8 mm in group 1b and controls respectively (p<0.05 for both). In 40% of group 1a patients (12/30) no signs of BPH were diagnosed. The prostate volume in group 1a was 49.6±25 cm3 (12-130 mm) vs 67.6±21 cm3 (47-190 mm) in group 1b (p<0.05) and had no insignificant difference vs controls (p>0.05). Chronic prostatitis detected in 8 patients of group 1a, in 27 and 7 patients in groups 1b and 2 respectively. In 18 patients of group 1a the myofascial trigger points in pelvic and spine muscles were detected.

Conclusions.
Transabdominal functional US is feasible and reliable method to measure bladder neck motility in men. The bladder neck hypermotility in men is associated with LUTS, often irrelevant to BPH.
ACCESSIBILITY, SUCCESS AND SAFETY OF PERCUTANEOUS PANCREAS ALLOGRAFT ULTRASOUND-GUIDED BIOPSY IN A NEW SURGICAL TECHNIQUE: RETROPERITONEAL GRAFT PLACEMENT

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OBJECTIVES: Retroperitoneal graft position in pancreas transplantation is a new surgical technique that leaves behind the classical intraperitoneal placement in attempt to reduce postoperative morbidity and to divert exocrine secretions to the native duodenum of the recipient, mimicking a more physiological position. One of the controversial points about the retroperitoneal placement is the access for US-guided biopsy. Our objective was to prospectively evaluate the accessibility, success and safety of US-guided biopsy in retroperitoneal placed pancreas allografts.

METHODS: We present a prospective study including all pancreas transplantations using this technique in our institution (from May 2016 to February 2019). Our protocol includes a biopsy at 3 weeks and 1 year after transplantation, and also when graft rejection is suspected. Biopsies were performed under US guidance using local anaesthesia with a 16-gauge automated needle. Accessibility, adequacy of pancreatic tissue for histological examination and complications were recorded.

RESULTS: Thirty-one pancreatic transplantations in retroperitoneal placement were performed. There were 56 indications for biopsy, 47 of them were finally performed owing to its good accessibility (83.9%), all of them under US-guidance. In 4 cases, a previous CT was necessary (7.1%) in order to select the best approach. In 7 occasions the biopsy was not performed because of interposition of intestinal loops (n=7, 12.5%) and in 2 cases due to allograft hypervascularization (n=2, 3.6%). Classical anterior approach in supine decubitus position was changed to paravertebral approach in prone decubitus position in 6 (12.8%) patients. Forty-three (91.5%) biopsies were performed with only one needle pass. Adequate pancreatic tissue was obtained in 45 procedures (96.7%). Only one complication was recorded which consisted in self-limited intraabdominal haemorrhage which did not require surgical intervention.

CONCLUSIONS: Us-guided biopsy of retroperitoneal placed pancreas graft is feasible, safe and it achieves adequate sample examination in more than 95% of the procedures.
COMPARATIVE STUDY BETWEEN A pSWE AND 2D-SWE INTEGRATED IN THE SAME ULTRASOUND MACHINE TAKING TRANSIENT ELASTOGRAPHY AS REFERENCE METHOD

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Purpose: To evaluate the feasibility and usefulness of two novel elastographic methods, integrated in the same ultrasound machine, one pSWE and one 2D-SWE, for liver fibrosis (LF) assessment using Transient Elastography (TE) as the reference method.

Material and methods: 115 subjects were included, with or without chronic liver disease, in which LF was evaluated in the same session by TE (Fibroscan, EchoSens) and by pSWE and 2D-SWE techniques integrated in the same ultrasound machine (Samsung-Medison RS85). Reliable liver stiffness (LS) measurements were defined as follows: for TE the median values of 10 measurements with a success rate ≥60% and IQR/M<30%; for pSWE and 2D-SWE the median value of 10 measurements, with a reliability measurement index (RMI)>0.5 and IQR/M<30%; For classification of LF severity we used TE as reference method with the following cut-offs: F2≥7kPa, F3≥9.5kPa and F4≥12kPa [1].

Results: Reliable measurements by TE were obtained in 98.2%(113/115), by pSWE in 93.9%(108/115) and by 2D-SWE in 92.1%(106/115) subjects, so the final analysis included 101 patients. We divided the cohort into 3 groups: fibrosis <F2(66.3%), fibrosis F2-3(15.8%) and F4(17.8%). We observed a strong correlation between TE and 2D-SWE (r=0.85), between TE and pSWE (r=0.88) and between pSWE and 2D-SWE (r=0.90)(p=0.37). There were no significant differences between the mean values obtained by pSWE and 2D-SWE (p=0.96). The best cut off values calculated for pSWE are: F2 LS>5.9 kPa (AUROC=0.95, 95% CI(0.89–0.98), p<0.0001, Se=94.1%, Sp=89.5%, PPV=82.1%, NPV=96.8%) F4 LS>8 kPa (AUROC=0.98, 95% CI(0.94–0.99), p<0.0001, Se=94.4%, Sp=95.1%, PPV=81%, NPV=98.7%). The best cut off values calculated for 2d-SWE are: F2 LS>6.1 kPa (AUROC=0.93, 95% CI(0.86–0.97), p<0.0001, Se=91.1%, Sp=80.6%, PPV=70.5%, NPV=94.7%), F4 LS>7.6 kPa (AUROC=0.98, 95% CI(0.93–0.99), p<0.0001, Se=100%, Sp=91.5%, PPV=72%, NPV=100%).

Conclusion: The novel pSWE and 2D-SWE are feasible methods for assessing liver fibrosis, both techniques strongly correlating with TE results.

References:
A DIAGNOSTIC APPROACH OF CHRONIC LIVER DISEASE WITH A NEURAL NETWORK USING PARAMETERS DERIVED FROM ULTRASOUND B-MODE AND SHEAR WAVE ELASTOGRAPHY EXAMINATION.

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Objectives: Chronic Liver Disease (CLD) is one of the major causes of death and the major cause of Hepatocellular Carcinoma development., accurate diagnosis regarding CLD progress is, therefore, very important. Our aim is to build and train a Neural Network (NN) classifier that will estimate the impact of parameters derived from an Ultrasound (US) B-Mode and Shear Wave Elastography (SWE) examination in order to classify individuals into three main classes, F0-F1, F2-F3 and F4 fibrosis stages. Liver Biopsy (LB) was considered as ‘Gold Standard’.

Methods: Our dataset consisted of 211 individuals, 150 of them F0-F1, 39 F2-F3 and 22 F4 fibrosis stages. All individuals underwent an US examination performed by an experienced radiologist followed by a LB examination for individuals with fibrosis stage F1-F4. We randomly divided our dataset into training and test samples (70%-30%). For the training sample a 10-fold cross validation (CV) was performed. The SWE measurements of the Liver’s Right Lobe, the existence of Nodularity, the known etiology of each individual, the optimum Speed of Sound calculated from a US B-Mode image showing Liver Parenchyma and the diameter of Liver’s Caudate Lobe were used as inputs for the training and testing of a NN classifier.

Results: The NN classifier had a 10-fold CV accuracy of 93.02% and a 95% Confidence Interval (CI) of 92.94% - 93.11%. The mean accuracy of the classifier on the test samples was 89.95% with a 95% CI of 89.83% - 90.07%. The mean Area Under Curve (AUC) for the test samples was 0.976 with a 95% CI of 0.969 – 0.984.

Conclusions: The NN classifier achieved high accuracy results and could be used to assist radiologists in CLD assessment in everyday clinical practice.
ASSESSMENT OF CHRONIC LIVER DISEASE WITH SOUND TOUCH ELASTOGRAPHY (STE) AND SHEAR WAVE ELASTOGRAPHY (SWE) USING LIVER BIOPSY AS GOLD STANDARD

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Objectives: Chronic Liver Disease (CLD) is currently one of the major causes of death and the major cause of Hepatocellular Carcinoma development. Sound Touch Elastography (STE) that is available in Resona 7 Ultrasound (US) device and is similar to Shear Wave Elastography (SWE), seems promising for CLD diagnosis but needs to be validated. The aim of this study is to compare the diagnostic performance between the STE and SWE for CLD assessment, using Liver Biopsy (LB) as “Gold Standard”.

Methods: 290 subjects, 68 normal (F0) and 222 with CLD (F1-F4), were included in the study. A B-Mode and Elastographic examination was performed on each patient with Resona 7 and Aixplorer US devices. The STE (Resona 7) and SWE (Aixplorer) measurements were performed on the Right Lobe (RL) of each patient and were compared to LB results according to the Metavir Classification System (F0-F4). An informed consent was obtained for each participant. Receiver Operating Characteristic (ROC) analysis was then performed for each of the two methods to obtain best cut-off stiffness values.

Results: ROC analysis showed AUC_{STE}=0.9741 and AUC_{SWE}=0.9854 for F=F4 (Cirrhosis), AUC_{STE}=0.9723 and AUC_{SWE}=0.9755 for F=3, AUC_{STE}=0.9675 and AUC_{SWE}=0.9662 for F=2, AUC_{STE}=0.8889 and AUC_{SWE}=0.9288 for F=1 Fibrosis Stages. Best cut-off stiffness values for each method (STE/SWE) were: F=F4: 12.2/13.5 kPa, F=3: 9.5/8.7 kPa, F=2: 9.15/8.55 kPa, F=1: 6.5/6.05 kPa respectively.

Conclusions: Both STE and SWE can differentiate between all Metavir fibrosis stages. SWE seems more reliable in differentiating normals from patients with F=1 and Cirrhotic patients (F=F4) but less accurate in diagnosing intermediate stages (F=2, F=3).

Oral presentations
CEUS IMAGES OF AN INFREQUENT BENIGN FOCAL LIVER LESION WITH FEATURES OF MALIGNANCY IN A PATIENT WITH CHRONIC LIVER DISEASE

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Introduction: Hypoenhancement during portal phase is highly specific for malignancy on contrast enhanced ultrasound (CEUS) examination for any focal solid liver lesion. Here we report an unusual benign lesion with such imaging finding.

Clinical case: This was an asymptomatic 62 years old male with steatosis and advanced fibrosis. He had type 2 diabetes and genotype 1b HCV infection. HCV was eradicated with antiviral therapy two years earlier. He was enrolled in a six month intervals ultrasound examination screening program for early detection of hepatocellular carcinoma. Four hypoechoic focal liver lesions one centimeter in diameter were detected on scheduled ultrasound examination. On CEUS, the nodules showed isoenhancement in arterial phase followed by hypoenhancement early in portal phase. Percutaneous fine needle 20 g trucut biopsy was carried out. It demonstrated epithelioid granulomas without necrosis. Thoracic CT, ACE analysis, sputum analysis for mycobacteria, and viral diseases including reactivation of HCV were considered. The only positive finding was high titles for IgM CMV Ab, which fell up to negative assay two weeks later. The nodules were not present on successive examinations.

Comments: Liver granulomas are present in 2-10 % of liver biopsies, but granulomatous liver nodules are extremely infrequent. They appear in less than 5 % of sarcoidosis. Epithelioid granulomas without necrosis can also be due to mycobacteria, syphilis, Brucella, Whipple disease, drug reaction, autoimmune diseases, PBC or neoplasm. Biopsies of Inflammatory pseudotumor can demonstrate xantogranulomas or plasma-cell granulomas. CMV infection, the only plausible cause of granuloma in the present case are typically from the fibrin-ring type and we have not encountered previous report of its presentation as focal liver lesion. Whatever the cause, focal liver granulomas show on CEUS iso- or hyperenhancement during the arterial phase with wash-out during portal phase so must be considered in the differential diagnosis of malignant liver lesions.
THE USEFULNESS OF TRANSABDOMINAL ULTRASOUND AND PERCUTANEOUS BIOPSY IN THE DIAGNOSIS AND STAGING OF GASTRIC CANCER

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Introduction: Gastrointestinal endoscopy (GIE) is the technique of choice for the diagnosis of gastric cancer (GC). However, transabdominal ultrasound (TAU) can be the first imaging technique performed in these patients since clinical signs of GC are often unspecific. GIE obtained gastric biopsies not infrequently offer nondiagnostic results. In these cases, TAU does not use to be considered as an alternative tool to obtain gastric samples. We report two difficult cases showing the value of TAU and TAU guided biopsy in the diagnosis of gastric cancer.

Clinical cases:
1. Gastroenterologist on duty was requested to attend a 52 years old man from the emergency department. He had abdominal pain, vomit and 8 kg weight loss in the last month. TAU was immediately performed, showing gastric outlet obstruction, gastric wall thickening with loss of layers integrity, lymph node enlargement, light ascites and peritoneal nodule. TAU guided 20 g core gastric biopsy was carried out at that time so definitive diagnosis and staging of advanced ring-cell GC were obtained with TAU. GIE was not performed.
2. Endoscopic ultrasound (EUS) was requested to be performed for a 70 years old woman with suspected linitis plastica. Conventional and large capacity forcep endoscopic biopsies had offered negative results for malignancy. As usually in our unit, TAU was performed immediately before EUS to assess the entire abdomen. Gastric wall thickening was evident, so TAU guided 20 g core gastric biopsy was performed, as well as EUS guided biopsy with Procore 22 g needle (Cook®). This last biopsy was not diagnostic, but TAU guided biopsy showed ring-cell cancer.

Comments: GC can be demonstrated by TAU in the emergency unit in patients with non-specific complaints. TAU should be considered as a valuable way to obtain gastric wall samples even or specially after non-diagnostic endoscopy guided biopsies.
PANCREATIC METASTASIS FROM NEUROENDOCRINE CARCINOMA OF THE UTERINE CERVIX DIAGNOSED BY ENDOSCOPIC ULTRASOUND GUIDED FINE NEEDLE ASPIRATION

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Introduction: Pancreatic metastasis from uterine cervical cancer is extremely rare and only seven cases have been reported to date. Here we report a case diagnosed by endoscopic ultrasound guided fine needle aspiration (EUS-FNA).

Clinical case: A 35-year-old woman was admitted with two weeks of abdominal pain. Physical examination revealed a painful abdomen at deep epigastric palpation. Serum lipase was 705UI/L. Nine months earlier, the patient had undergone chemoradiotherapy for a neuroendocrine cervical cancer. No signs of recurrence have been observed so far. A contrast-enhanced computed tomography showed an ill-defined hypodense area in the body and tail of pancreas, suggestive of focal pancreatitis. EUS showed a 30mm nodular well-defined hypoechoic pancreatic body mass, without pathologic lymph nodes and without vascular invasion. Elastography depicted it as a hard lesion so EUS-FNA was performed with a 22-gauge needle through the gastric body. Histological and immunohistochemistry profile were compatible with metastasis of neuroendocrine tumour, similar to the features of cells from the previous neuroendocrine cervical carcinoma. The lesion was resected and the patient is now undergoing chemotherapy.

Comments: Neuroendocrine tumors of the cervix account for less than 5% of all cases of cervical cancer. They show an aggressive behaviour with early distant metastasis and a fatal clinical course. Although metastasis to the pancreas are exceptional, such an event must be considered even in the absence of local recurrence. The clinical presentation of pancreatic involvement can range from asymptomatic status to pancreatitis or obstructive jaundice. EUS-FNA is a safe and accurate method for differential diagnosis of pancreatic tumors and determination of therapeutic strategy.
POINT SHEAR WAVE ELASTOGRAPHY HIGHLY CORRELATES TO FIBROSCAN IN PATIENTS WITH LIVER DISEASE. A PILOT STUDY

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Objectives: To prospectively assess the usefulness of point-shear wave elastography (pSWE) for staging fibrosis in patients with chronic liver diseases of different aetiologies using transient elastography (TE) as the reference standard.

Methods: Consecutive patients referred to our unit for liver stiffness measurement with the FibroScan® device who also accepted undergoing examination by pSWE (Arietta70 system, convex broadband probe, Hitachi Ltd, Japan) were included. Overweight and NAFLD patients were excluded. Reliability criteria considered for TE were 10 valid measurements and IQR/M<30%. pSWE measurements were considered valid when 10 measurements with VSn>50% and IQR/M<30% were obtained. Cut-off values used for F2/F3/F4 were 7,2/9,6/14,5 kPa for TE and 7,2/8,5/14 kPa for pSWE. Correlation between the data was tested with the nonparametric Spearman rank correlation analysis. Diagnostic accuracy of pSWE for ruling-in and ruling-out significant fibrosis and advanced fibrosis was analyzed.

Results: Forty three patients were studied. Four of them were excluded for non-valid TE. Twenty three were female (59%), mean age 58 years. Aetiology of liver disease was HCV (22), HBV (8), PBC (4), miscellany (5). Fibrosis stage obtained by TE were 28 F0/1, 6 F2, 3 F3, 2 F4. pSWE was unreliable in 10 patients. Since reliability parameters for pSWE are not sufficiently established we decided to evaluate the performance of the technique separately in the whole group (WG) and in patients with valid exams (VEG). There was a high correlation between pSWE and TE values (r=0.68 for WG, r=0.81 for VEG, both p<0.0001). Accuracy of pSWE for the diagnosis of F≥2 was 0,84 (WG) vs 0,93 (VEG) and for F≥3 0,94 (WG) vs 0,96 (VEG).

Conclusions: At the cutoff values established, pSWE highly correlated with TE for staging liver fibrosis. Reliability criteria seems to have little impact in performance of pSWE.
KIDNEY DOPPLER ULTRASOUND TO PREDICT SEVERITY OF ASCITES AND RISK OF KIDNEY INJURY IN PATIENTS WITH CIRRHOSIS AND ASCITES RECEIVING TREATMENT WITH NONSELECTIVE BETA-BLOCKERS

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INTRODUCTION
Patients with cirrhosis and ascites, especially those with refractory ascites, are at risk for acute kidney injury (AKI). It has been postulated that nonselective beta-blockers (NSBB) may increase this risk through a not well understood hemodynamic mechanism. Doppler ultrasound of the kidney may detect hemodynamic changes in renal parenchyma. This study aims to determine if renal artery resistive index (RI) predict severity and risk of AKI in patients receiving NSBB.

MATERIAL AND METHODS
A prospective multicentric observational study was conducted. Analysis of cardiac function (cardiopulmonar catheterization and echocardiography), hepatic hemodynamic study and renal function (Doppler ultrasound and blood/urine analysis) was performed at baseline and 4 weeks after treatment with NSBB. Risk of kidney injury (RKI) was defined as ≥15% increase in creatinine/cystatin C levels or ≥15% decrease in glomerular filtration rate (GFR).

RESULTS
35 patients were included (17 diuretic-sensitive ascites (DSA); 18 diuretic-resistant ascites (DRA)). DRA patients had higher MELD-Na score and lower mean arterial pressure. No differences in Child-Pugh score, HVPG nor in systolic function parameters were found. They had higher basal RI in comparison with ASD patients (0.74 ± 0.07 vs 0.68 ± 0.06, p=0.02). No correlation between basal RI and peripheral vasodilation degree, systolic function, renal function or portal hypertension was found. Higher RI measured at upper pole of right kidney was associated with significant increase in creatinine levels (rho=0.47, p=0.02), cystatin C (rho=0.51, p=0.01) and decrease in GFR glomerular (rho=-0.62, p<0.1). Upper pole right kidney RI showed an AUROC of 0.83 (0.66-1.0, p=0.02) for the diagnosis of RKI (Figure). NSBB did not have an impact on renal RI but did so on cardiac systolic function measured by systolic intraventricular pressure peak gradients.

CONCLUSIONS
Renal artery RI allows classification of ascites severity in patients with cirrhosis and may be a useful tool to predict RKI in patients with ascites treated with NSBB.
Figure. ROC curve.
UTILITY OF ULTRASOUND WITH INTRAVENOUS CONTRAST IN THE DIAGNOSIS OF PATHOLOGY OF THE GALLBLADDER.

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Objective:
To determine the diagnostic value of contrast ultrasonography in the diagnosis of gallbladder pathology, mainly in complicated acute cholecystitis.

Material and method:
Data was collected from 23 patients who had already been diagnosed by B-mode ultrasonography of biliary pathology. The exploration was completed with contrast-enhanced ultrasound (CEUS) to evaluate the existence or absence of enhance and washing of contrast, performing a dynamic study in real time.

Results:
Most patients can be diagnosed of acute cholecystitis with their common clinical features and a compatible ultrasonography. Data collected from our research shows a significant amount of patients in which contrast ultrasonography provided a useful exploration to better characterize and diagnose their pathology.

Conclusion:
Early diagnosis in complicated cholecystitis has great importance due to its association with morbidity and mortality. CEUS is a useful exploration to improve the gallbladder pathology diagnosis.
THE CONTRIBUTION OF AUTOMATED BREAST VOLUME SCANNER (ABVS) AND ADVANCED ELASTOGRAPHY IN THE DIAGNOSTIC OF THE MORPHOLOGICAL BORDERLINE LESIONS

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Objectives
The current modalities of breast imaging (ultrasonography, mammography, MRI) have high sensitivities for detecting breast lesions but they do not have high specificities. This has resulted in close monitoring or unnecessary biopsies of many benign lesions. The new imaging tools increase the confidence in breast evaluation.

Methods
In our group practice, ABVS and advanced elastography are performed by two physicians, using Acuson S2000 HELX ABVS.
From a sample of 1725 patients (2016-2019), 16-75 years old, a selection of 814 cases with BI-RADS:3 and 4, after mammography and handheld ultrasonography screening, was analysed.
The ABVS overcomes the inherent limitations of the breast investigations: small field of view and poor reproducibility.
Elastography is an additional imaging mode, based on tissue stiffness to characterize any lesion as benign or malignant.
Since 2003, elastography technology has improved with advances in diagnostic ultrasound systems. Virtual Touch Imaging Quantification (VTIQ) combines imaging and quantification in one single acquisition with measurements in a larger field of view.

Results
The coronal slices of the ABVS, obtained from the nipple to the chest wall are unique, allowing quick identification of areas with impaired architecture and cancer in situ detection.
There were various findings, from large tumors to small malignant tumors (4mm diameter), including three cases of mucinous cancers, with completely benign appearance in conventional handheld ultrasonography, but with retractile image on coronal view during ABVS, linked with elastography changes, confirmed by biopsy.
Some cancer may show benign morphological features (medullary carcinoma, mucinous carcinoma, high nuclear grade-triple negative).
Invasive lobular cancer could manifest like a hypoechoic heterogeneous area with shadowing.

Conclusions
ABVS has improved the quality of ultrasound images, sonography being now a major mode for detecting breast cancer in situ.
The advanced elastography and ABVS are reclassifying BI-RADS:3 and 4 lesions, upgrading to biopsy or downgrading to follow-up.
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STRUCTURAL AND MECHANICAL DIFFERENCES OF BADMINTON PLAYERS ACHILLES TENDONS BETWEEN OPERATED AND NON-OPERATED TENDONS

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Objectives: The aim of the study was to describe the differences on structural and mechanical characteristics of Achilles tendon in operated and non-operated tendons in badminton senior players who had an Achilles tendon rupture.

Methods: 10 senior badminton players (49.8 ± 10.7 years, 173.9 ± 11.7 cm, 77.6 ± 15.9 kg, 13.4 ± 8.2 training-hours-week⁻¹) voluntarily participated in a descriptive study. All players had suffered an Achilles tendon rupture and were currently recovered and back to the competition. A Logiq® S8 ultrasound was employed to assess the tendon structure and elasticity index (EI) of both Achilles tendons, operated and non-operated. Structural characteristics were quantified with ultrasonography with high-resolution grey scale B-mode. EI, which higher values indicate stiffer properties, was measured with elastography and B-mode. Tendon stiffness was also measured with a hand-held myotonometer, MyotonPro®. The variables measured were: thickness, width, cross sectional area (CSA), EI, tone, logarithmic decrement and stiffness. All data were taken in the free tendon region at 3 cm up from calcaneal insertion with the feet out of the desk and in anatomical position. Significance of differences between the operated and non-operated Achilles tendons were determined using Student t test for related samples. The significance criteria was p < 0.05.

Results: Operated tendon showed higher values in thickness (0.80 ± 0.21 vs 0.59 ± 0.10 cm; p = 0.001), CSA (1.14 ± 0.42 vs 0.71 ± 0.19 cm²; p = 0.004) and EI (1.50 ± 0.63 vs 1.15 ± 0.31 A.U.; p = 0.030). No significant differences were observed in tendon width, tone, logarithmic decrement and stiffness between the operated and non-operated Achilles tendons.

Conclusions: The main differences between operated and non-operated Achilles tendons were found in structural variables and EI. These results show the key points to injury prevention programs focused on this kind of players.
SURVEILLANCE NECK ULTRASOUND AFTER THYROIDECTOMY FOR DIFFERENTIATED THYROID CARCINOMA.

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Learning objectives:
To describe the normal ultrasound findings in the neck after thyroid surgery.
To review the usual and not so usual findings in cases of locoregional recurrence.
To discuss some of the conditions that may mimic recurrence.

Background
The incidence of thyroid cancer has increased substantially in recent decades and therefore, there has been a subsequent increase in the number of surveillances. Serum thyroglobulin monitoring and neck ultrasound are most sensitive techniques for the detection of recurrence. An ultrasound examination of the neck performed 6 to 12 months after thyroid surgery in patients with differentiated thyroid cancer is strongly recommended by the American Thyroid Association and considered mandatory by the European Thyroid Association for locoregional surveillance.

Findings/procedure:
The post-thyroidectomy surgical bed is typically seen as an inverted triangular hyperechoic area on transverse imaging of the paratracheal area, reflecting fibrofatty connective tissue, sometimes with visible surgical clips. Thyroid bed recurrence typically manifests as a hypoechoic hypervascular soft tissue lesion, which may also have a taller-than-wide shape, irregular margins, and microcalcifications or cystic components. Metastatic nodes have at least one of the following characteristics: microcalcifications, cystic regions, peripheral or diffusely increased vascularization, focal hyperechoic regions, and size of 8mm or larger and 10mm or larger in the short axis for central and lateral neck nodes, respectively. Finally, wide variety of pathologic findings may be visualized in the postoperative neck, potentially mimicking recurrent disease such as surgical material, chronic granulomatous lesion, thymus, parathyroid adenoma, thyroglossal duct cyst, traumatic neuromas or paraganglioma.

Conclusions:
Neck ultrasound is a widely used modality for detecting locoregional recurrence in differentiated thyroid tumors. Radiologist should be aware of the usual findings in both the surgical bed and nodal recurrence and also of the variety of conditions that may potentially mimic recurrent disease.
THYROID ULTRASOUND (US): DIFFUSE DISEASES

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Objectives
In this poster we have as main objectives: review the thyroid anatomy and the imaging technique by US, show cases of diffuse diseases and its evaluation by US and also specific US features that help classify between the different thyroiditis.

Methods
US is indispensable for the radiologic evaluation of the thyroid pathology and it is accomplished by using a high-frequency liner transducer.

Results
A wide spectrum of diffuse disease affects the thyroid gland. The most common cause of diffuse thyroid disease is autoimmune thyroid disease: Hashimoto’s thyroiditis, Graves disease and subacute lymphocytic thyroiditis. It is important to distinguish between these entities because they may have similar clinical presentation but their treatment varies. The clinical diagnosis is usually based on symptoms, laboratory analysis and immunology. US is not generally required for the diagnosis of thyroid diffuse diseases, however Hashimoto’s is primarily a subclinical disease and US can detect this subset on patients before they come to clinical attention. In addition, US has a crucial role in excluding focal thyroid disease and thyroid malignancies. US is useful too in the evaluation of the lymph nodes.

There are several characteristic sonographic features of Hashimoto’s thyroiditis, and for example, the presence of innumerable hypoechoic solid micronodules surrounded by an echogenic rim is highly specific. However, there are no specific grayscale ultrasound findings of Graves disease. Although thyroid scintigraphy still plays a role in the diagnosis, color and spectral Doppler could be useful to differentiate between Graves and Hashimoto disease.

Conclusions
Knowledge of US normal and pathologic US features associated with color Doppler findings is crucial for accurate diagnosis and for guiding appropriate management.
ROLE OF CONTRAST-ENHANCED ULTRASOUND (CEUS) IN THE DETECTION OF COMPLICATIONS ENSUING US-GUIDED INTERVENTIONAL PROCEDURES. A MULTICENTER STUDY

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OBJECTIVES
Aim of this study was to assess the contribution of CEUS to the detection of complications ensuing US-guided hepatic interventional procedures in field practice of 7 interventional ultrasound centers

METHODS
The participating centers retrospectively selected all patients in whom CEUS detected complications after US-guided liver biopsy for diffuse liver disease or focal liver lesions (FLL) and after ablation of liver tumors over the last decade.

RESULTS
22 patients (13 M/9 F, median age 73 yrs.) experienced complications after 5 liver biopsies and 17 ablations of FLL (16 HCC) carried out with PEI (2), MW (2), RF (13). Median size of the 20 targets was 22.5 mm (range 15-39).

In 10 cases CEUS performed at the end of ablation demonstrated 6 sub-segmental/segmental infarcts, 3 active bleedings (2 capsular tears with hemoperitoneum, 1 hemobilia), 1 subcapsular hepatic hematoma (SHH). Only 2 patients underwent RF to achieve hemostasis.

In 5 symptomatic cases CEUS performed within 6 hours after biopsy displayed 1 capsular tear actively bleeding, 1 hemobilia and 3 SHHs, one of which actively bleeding. Transarterial embolization (TAE) was carried out in 1 case and blood transfusion (BT) was needed in 1 patient.

In 7 cases CEUS was performed 24-48 hours after interventional maneuvers. In 6 symptomatic cases CEUS showed 1 capsular tear actively bleeding, 1 hemothorax (due to intercostal artery bleeding), 1 pseudoaneurysm of a right arterial branch, 1 segmental infarct, 2 abscessed ablated areas; in the remaining case, routine CEUS check displayed 1 SHH. In this group of patients TAE (2), percutaneous abscess drainage (2), and BT plus TAE (1) were performed.

CONCLUSIONS
CEUS can be confidently used to detect iatrogenic hemorrhagic actively bleeding complications especially in the immediate and early (<6 hours) time period after liver biopsy or ablation. In addition, ischemic segmental areas early arising after ablation are easily detected.
HEPATOCELLULAR CARCINOMA WASHOUT SPEED IN CEUS IN PATIENTS WITH CHRONIC LIVER DISEASE

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Methods:
This retrospective study included 354 patients with cirrhosis or chronic liver disease and suspected to have HCC on the basis of gray scale US. The final diagnosis of HCC was established by an imaging method (contrast enhanced CT or MRI) or biopsy. All 354 patients with HCC were examined by CEUS (250 men, 104 women, mean age 64.6±9.8 years); 318 patients had liver cirrhosis and 36 chronic hepatopathy with severe fibrosis. CEUS was considered conclusive for HCC if a typical pattern was present. The nodules were classified according to their size in ≤3cm, 3-5cm and >5cm. Washout was divided into three grades with reference time of contrast injection: late washout (>120 seconds), early washout (60-120 seconds) and very early washout (31-60 seconds).

Results:
In the arterial phase: hyperenhancement pattern was present in 319/354 cases (90.1%), isoenhancement in 26/354 cases (7.4%) and hypoenhacement in 9/354 cases (2.5%).
In the portal phase: washout was observed in 140/354 cases (39.6%); in 185/354 (52.3%) cases the nodules were isoenhancing and in 29/354 (8.1%) the arterial hyperenhancing pattern was maintained.
In the late phase washout was observed in 278/354 (78.5%) cases, isoenhancement in 66/354 cases (18.6%) and hyperenhancing pattern in 10/354 (2.8%) cases. Among all the patients with washout, there were 30 cases (10.8%) with very early washout (31-60 seconds); 110 cases (39.6%) with early washout (60-120 seconds) and 138 cases (49.6%) with late washout (>120 seconds).
The nodules ≤3cm had no washout in the late phase in 36.6% of the cases, while in nodules >5cm washout was absent only in 9.6% of cases (p<.0001).

Conclusions:
In our study, washout was present in 278/354 (78.5%) of the cases, and 10.8 % had very early washout (31-60 seconds).
The nodule size correlates with the washout degree p<.0001.

References:

THE ROLE OF CONTRAST ENHANCED ULTRASOUND IN PERCUTANEOUS TRANSTHORACIC ULTRASOUND-GUIDED FINE NEEDLE BIOPSY OF LUNG CARCINOMA.

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Objectives: the role of contrast-enhanced ultrasound (CEUS) in the characterization and biopsy of peripheral pulmonary lesions is still under debate. Only a few studies highlighted the importance of CEUS in the recognition of necrotic areas while approaching the pulmonary lesions adhering to the pleura. We investigate the role of CEUS in percutaneous transthoracic ultrasound-guided fine needle biopsy (PTNB) in a large sample of patients with peripheral lung carcinoma.

Methods: we prospectively enrolled 322 patients (188 male, 134 females, mean age 64.8 years ± 13.9), referred to our Hospital with subpleural carcinoma. CEUS was preliminary done only in 151 of them, performing an injection of 4.8 ml SonoVue (Bracco, Italy), while no injection of CEUS was performed in others 151. We used a 1:1 randomization. We didn’t use other selection criteria like age, size, comorbidies, etc. All patients underwent to chest contrast computed tomography (CT), which was viewed before the PTNB. Two well trained operators, with a 30 years experience in the field, performed the biopsies using 18 G Meneghini’s modified needle. Histological diagnosis was performed by two skilled pathologists in pulmonary cancer.

Results: 91% of patients (293) has positive histologic finding consistent with lung carcinoma. The pathological diagnosis rate were 92 % in patients with injection of CEUS (152 patients) and 90,5 % (141 patients) without CEUS somministration.

Conclusions: In our study, there was no statistically significative difference in terms of diagnosis in the two groups. CEUS did not improve the diagnostic accuracy of PTNB in the approach of peripheral lung carcinoma. The real discriminant factor was the operators experiences in performing echo-guided PTNB and the pathologist experience. A multidisciplinary approach in a dedicated setting (Lung Unit) is crucial to optimize the outcomes.

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3D HARMONIC AND SUBHARMONIC CONTRAST-ENHANCED ULTRASOUND FOR CHARACTERIZATION OF BREAST MASSES: A MULTI-CENTER CLINICAL STUDY

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Objective: Breast cancer is the second most common cancer in the world and the most frequent type of cancer among women (30% of all cancers). This multi-center study assessed the ability of contrast-enhanced, non-linear 3D ultrasound imaging to characterize previously indeterminate breast lesions.

Methods: In total 219 patients with biopsy-proven breast lesions were enrolled in this FDA approved study (IND: 112,241). Following conventional ultrasound and power Doppler imaging (PDI), contrast-enhanced 3D harmonic imaging (HI; transmitting/receiving at 5.0/10.0 MHz) and 3D subharmonic imaging (SHI; transmitting/receiving at 5.8/2.9 MHz) were performed using a modified Logiq 9 scanner (GE Healthcare, Waukesha, WI, USA) with a 4D10L probe. The dosage of the ultrasound contrast agent Definity (Lantheus Medical Imaging, N Billerica, MA, USA) used was optimized separately for HI (0.25 mL) and for SHI (20 μL/kg). Five blinded radiologists independently scored the 4 randomized, ultrasound imaging modes using a 7-point BIRADS scale from negative to highly suggestive of malignancy (from 0 to 6). ROC analysis and reverse, step-wise logistical regression were applied to assess diagnostic accuracy using biopsy results as the reference standard.

Results: Biopsies resulted in 164 (75%) benign and 55 (25%) malignant lesions. 3D HI showed flow in 8 lesions (5 benign and 3 malignant), whereas 3D SHI visualized flow in 83 lesions (58 benign and 25 malignant). Diagnostic accuracies ranged from 0.55 to 0.94 for baseline ultrasound, 0.52 to 0.93 for PDI, 0.63 to 0.85 for HI and 0.55 to 0.91 for SHI. None of the areas under the ROC curves were statistically different from one another (p>0.056).

Conclusion: 3D SHI is better at detecting contrast flow in vascular breast masses than 3D HI. However, compared to conventional ultrasound imaging there was no significant improvement in the characterization of indeterminate breast lesions using 3D SHI.
A NEW SCORE FOR PREDICTING ESOPHAGEAL VARICES IN PATIENTS WITH COMPENSATED LIVER CIRRHOSIS

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Objective: The aim of the study was to formulate and assess the usefulness of a new non-invasive score to predict the presence of esophageal varices (EV) in cirrhotic patients.

Material and method: A prospective study was performed in 77 subjects with compensated liver cirrhosis (diagnosed based on clinical, biological and elastographic criteria -Liver transient elastography>12.5kPa[1]), who underwent upper endoscopy, abdominal ultrasound, spleen and liver stiffness measurements (SSM and LSM, respectively) with a 2D-SWE technique from General Electric (Logiq E9) and biologic tests in the same session. Reliable SSM and LSM were defined as the median value of 10 measurements acquired in a homogenous area with IQR/M<0.30.

Results: We obtained reliable SSM in 98.7% (76/77) subjects and reliable LSM in 97.4% (75/77). 75 subjects were included in the final analysis, 64% (48/75) with EV. The mean SS, LS, spleen size (cm) were significantly higher in patients with EV (16.77±2.92 kPa vs. 13.2±2.66 kPa, p<0.0001; 14.12±2.09 kPa vs. 11.5±1.56 kPa, p<0.0001; 14.49±2.09 cm vs. 13.05±1.86 cm, p=0.004, respectively). Thrombocytes were significantly fewer in patients with EV (90,125±34,425 vs. 135,738 ± 58,905, p=0.0001).

In univariate analysis, SSM, LSM, spleen size and thrombocytes were associated with the presence of EV, all p<0.0001. In multivariate analysis, the model including SSM, LSM, spleen size and thrombocytes had the following p-values: p=0.01, p=0.01, p=0.03 and p=0.01. Using these factors as predictors, by multiple regression analysis, we obtained the following score: Presence of EV=0.04*SSM + 0.06*LSM + 0.04*spleen size – 1*10^-6*thrombocytes -1.17. The score had a cut-off value >0.48(AUROC=0.9, Se=95.8%, Sp=96.3%, PPV=97.9%, NPV=92.9%) for predicting the presence of EV.

Conclusion: Using the model including SSM, LSM, spleen size and thrombocytes we can rule in the presence of EV with a positive predictive value of 97%.

COMPARASION BETWEEN THE PERFORMANCE OF POINT SHEAR WAVE ELASTOGRAPHY AND 2D-SHEAR WAVE ELASTOGRAPHY FOR THE NONINVASIVE PREDICTION OF PORTAL HYPERTENSION

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Aim: The aim of the study was to establish the usefulness of spleen stiffness (SS) values measured by means of two elastographic techniques: point shear wave elastography (pSWE) and 2D-shear wave elastography (2D-SWE) as non-invasive markers for predicting the presence of esophageal varices (EV) and to compare their performances.

Material and method: A prospective study was performed, including 86 subjects with compensated liver cirrhosis who underwent both upper endoscopy and SS measurements (SSM) by means of two elastographic techniques: pSWE - using virtual touch quantification (VTQ) technology (Acuson S2000-Siemens Medical Solutions); and 2D-SWE (LOGIQ E9-General Electric), in the same admission. Reliable SSM were defined for both techniques as the median value of 10 measurements acquired in a homogenous area with (IQR/M) <0.30. Compensated liver cirrhosis was diagnosed based on clinical, biological and elastographic criteria (Liver transient elastography>12.5 kPa) [1].

Results: We obtained reliable SSM in 98.8% (85/86) by means of 2D-SWE.GE and in 96.5% (83/86) subjects by means of pSWE-VTQ. 83 subjects were included in the final analysis, 63.8% (53/83) of them with EV. The best SS cut-off value by 2D-SWE.GE for predicting the presence of EV in our study group was 13.4 kPa (AUROC–0.89; sensitivity-85%; specificity- 93.3%; PPV-95.7%; NPV-77.8%), while for pSWE-VTQ it was 2.8 m/s (AUROC–0.65; sensitivity-60%; specificity-70%; PPV-78%; NPV-50%). Based on AUROC comparison, 2D-SWE.GE performed significantly better than pSWE-VTQ to predict the presence of EV (p=0.0011).

Conclusion: Although there are no significant differences between the feasibility of the two methods (p=0.62), it seems that 2D-SWE.GE has a better performance in predicting the presence of EV as compared with pSWE-VTQ (p=0.0011).

THE VALUE OF ULTRASONOGRAPHY AND ULTRASOUND ELASTOGRAPHY IN THE MANAGEMENT OF CASES WITH HYPERPARATHYROIDISM

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Background and aim. The clinical aspect, diagnosis and therapy of primary hyperparathyroidism have changed during the last twenty-five years. Nowadays, primary hyperparathyroidism becomes a common endocrine disorder. The most common lesion, found in almost 80% of the patients with primary hyperparathyroidism, is represented by a single benign parathyroid adenoma. The aim of the present study is to determine the values of different imaging investigations in the preoperative localization of the parathyroid adenoma.

Material and methods. We included in this retrospective analysis all the cases with primary hyperparathyroidism hospitalized in our department during the last five years. The preoperative exploration of the patients included usually neck ultrasound, parathyroid sestamibi scan and, in some of the cases, parathyroid elastography. Ultrasonography is a non-invasive modality, which is easily available at low cost and co-existing thyroid pathology can be assessed or detected. Sestamibi scans was helpful in identifying ectopic parathyroid tissue, particularly in the mediastinum. Parathyroid elastography was utilized in some subjects with the intention to enhance the accuracy of ultrasound preoperative localization of parathyroid adenomas in cases with primary hyperparathyroidism.

Results. The study group included 45 patients with primary or tertiary hyperparathyroidism, diagnosed by specific tests. All these cases were evaluated by neck ultrasonography and parathyroid sestamibi scan. In 22 patients 2D-shear wave elastography (2D-SWE) was performed for evaluation of parathyroid adenoma detected by ultrasound.

The mean El measured by 2D-SWE in the parathyroid lesions was 10.2 ± 4.9 kPa, significantly lower than that of the nearby normal thyroid parenchyma (19.5 ± 7.6 kPa, p = 0.007), indicating soft tissue. All these cases were operated and the data indicated the cure of hyperparathyroidism in all except two patients (95% of the cases).

Conclusion. The high rate of cure after surgery indicates the utility of imaging explorations in preoperative evaluation of patients with hyperparathyroidism.
EVALUATION OF HEPATIC FIBROSIS ASSESSED BY SEROLOGICAL MARKERS AND SHEAR WAVE ELASTOGRAPHY: PILOT STUDY.

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Methods
A unicenter retrospective study was carried out. All liver disease patients who underwent SWE in a tertiary referral hospital between 2017 and 2018 were selected. SM were determined for all etiologies with close analytics (<3 months) to the performance of the test. To classify the stage of fibrosis we used the accepted cut points of advanced fibrosis: APRI>1/FIB-4>2.67.

Results
239 cases were included. 30 patient presented advanced fibrosis according to SM. The area under the curve for advanced fibrosis by SWE was >0.8 (95%CI). The best cut-off point to determine advanced fibrosis was ≥7.55 (sensitivity 83.3%, specificity 66.8%). A negative predictive value of 96.5% was obtained (table-1). Table 2 shows the diagnostic ability of advanced fibrosis according to SW and SM by etiology.

Conclusions
1- SWE had an adequate diagnostic ability for determining advanced fibrosis in chronic liver disease compared with SM.
- A cut-off point SWE <7.55 predicts with high probability the absence of advanced fibrosis.
- Prospective studies are needed to support our results.

<table>
<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>Positive predictive value</th>
<th>Negative predictive value</th>
<th>False positive</th>
<th>False negative</th>
<th>Accuracy</th>
<th>Odds ratio</th>
<th>Youden index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>83,3%</td>
<td>66,4%</td>
<td>26,6%</td>
<td>96,5%</td>
<td>33,2%</td>
<td>16,7%</td>
<td>68,9%</td>
<td>10,07</td>
<td>0,5</td>
</tr>
</tbody>
</table>

95% confidence interval
Table-1.

| Etiology | Advanced fibrosis (APRI/FIB4) | | No advanced fibrosis (SWE) | |
|----------|--------------------------------|--------------------------------|--------------------------------|
|          | Yes | N % | No | N % | p-valor | Yes | N % | No | N % | p-valor |
| Viral    | 11  | 36,7 | 116 | 55,8 | 0,028 | 43  | 45,7 | 84 | 57,9 |
| Enolism  | 7   | 23,3 | 21  | 10,1 |       | 23  | 24,5 | 5  | 3,4  | <0,001 |
| NASH     | 7   | 23,3 | 57  | 27,4 |       | 18  | 19,1 | 47 | 32,4 |
| Autoimmune | 5   | 16,7 | 14  | 6,7  |       | 10  | 10,6 | 9  | 6,2  |

Table-2.
Sigmoid stenosis caused by diverticulitis versus carcinoma: validation of the sonographic parameters for their differentiation.

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1 Hospital Dr Peset, Valencia, Spain

Objective: to define and provide an external validation of the sonographic parameters that differentiate diverticulitis from colon cancer in patients with sigmoid colon stenosis.

Material and methods: ultrasound examinations of 62 consecutive patients with sigmoid stenosis (37 diverticulitis and 25 colon cancers) were prospectively evaluated. Mean age 67.9 ± 14.6 years. Thirteen ultrasonographic criteria retrieved from the literature were evaluated to differentiate between benign from malignant strictures. A score was built including the 10 parameters that showed significant differences between benign and malignant. Sensitivity, specificity, accuracy and positive or negative predictive values of each ultrasound sign were calculated, as well as the score on the sonographic scale.

Results: In complete agreement with a previous derivation study, loss of bowel wall stratification was the reliable criteria for the diagnosis of malignancy (96% and 75.7% sensitivity and specificity, respectively). Abrupt margins showed a sensitivity of 88% and a specificity of 86.5%. Sonographic score > 3 allowed the differentiation of carcinoma from diverticulitis with 96% of sensitivity and specificity of 81%, with an area under the ROC curve of 0.936. Pericolic fat stranding, fistulas or abscesses didn’t statistically significant differences between diverticulitis and carcinoma.

Conclusion: the variables that have to be evaluated in clinical practice to differentiate diverticulitis from colon carcinoma have been validated, as well as the quantitative score for use in daily clinical practice, especially useful in the context of emergencies.
NEW ULTRASOUND FUNCTIONAL SIGN OF CLEFT PALATE IN FETUS

Профессор Andrey Nadtochiy¹, Professor Natalia Starikova¹, Professor Marina Ageeva²
¹Central Research Institute of Dentistry and Maxillofacial Surgery, Moscow, Russian Federation, ²Russian Medical Academy of Continuing Postgraduate Education, Moscow, Russian Federation

Objectives
One of the important functions of the tongue is the influence on the formation dentoalveolar and maxillofacial systems. Clarification of peculiarities of tongue position and function in fetuses with cleft lip, cleft lip and palate, cleft palate (CL, CLP, CP) and the improvement of prenatal ultrasound diagnostics of cleft fetuses based on evaluation of fetus tongue position and motility.

Methods
57 CL/P fetuses 19-24 weeks gestation were undergone ultrasound examination: CL fetuses – 9, CLP fetuses – 37; CP fetuses – 11. 50 fetuses without CL/P formed the control group. In all patients and fetuses the tongue position and motility were the objects of special interest.

Results
All fetuses with CL had normal tongue form, position and function. 34 (91,9%) patients with CLP and all patients with CP had specific disorders of tongue form, position and function. Normal tongue position and motility in CL fetuses indicated the absence of CP. Abnormal tongue position and motility in CL fetuses indicated the presence of CP.

Conclusions
Patients and fetuses with CP (with or without CL) have the specific congenital disorders of tongue form, position and function. These findings may be use as the new important symptoms in prenatal CP ultrasound diagnostics.
ULTRASONOGRAPHIC SIGNS OF CIRRHOSIS AND PORTAL HYPERTENSION ACCORDING TO THE STAGE OF LIVER FIBROSIS EVALUATED BY SWE, A DESCRIPTIVE STUDY

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¹Hospital Universitario Virgen Macarena, Sevilla, Spain

BACKGROUND
Abdominal ultrasound is a very useful technique in the study and follow-up of patients with chronic liver disease. Ecographic diagnosis of advanced chronic liver disease is based on the presence of typical liver structure alterations and indirect sonographic portal hypertension signs. This ultrasound criteria have a high specificity for diagnosis of cirrhosis, but a low sensitivity. Nowadays, shear wave elastography (SWE) is being used as a noninvasive complementary tool in the staging of liver fibrosis in this patients. Nevertheless, it is unclear the relationship between the sonographic signs and the fibrosis stage.

MATERIAL AND METHODS
All consecutive patients referred to our hospital between June 2017 and January 2019 for ultrasound and SWE assessment were subject to recruitment. The aim of our study was to describe the ultrasonographic signs of cirrhosis and portal hypertension according to the stage of liver fibrosis evaluated by SWE. Advanced fibrosis was defined as SWE values > 7,41 kPa (F3-F4). The characteristic of liver contour was used as echographic cirrhosis sign. The presence of portal vein dilatation, splenomegaly and portal flow median velocity (PFMV) slowdown were considered portal hypertension signs.

RESULTS
The baseline characteristics of the 245 included patients are summarized in Table 1. In patients with advanced fibrosis (97), contour was nodular in 50% of cases, portal dilatation was present in 37%, splenomegaly in 40% and PFMV slowdown in 74% (Table 2). Ultrasound signs analyzed according to etiology of the chronic liver disease in patients with advanced fibrosis are shown in Table 3.

Table 1.

<table>
<thead>
<tr>
<th>Patients characteristics (N=245)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)*</td>
<td>58 (50-66)</td>
</tr>
<tr>
<td>Sex (female/male)</td>
<td>162/83</td>
</tr>
<tr>
<td>Etiology</td>
<td></td>
</tr>
<tr>
<td>VHC</td>
<td>89 (36,8%)</td>
</tr>
<tr>
<td>VHB</td>
<td>25 (10,3%)</td>
</tr>
<tr>
<td>Enolism</td>
<td>58 (24%)</td>
</tr>
<tr>
<td>NASH</td>
<td>28 (11,6%)</td>
</tr>
<tr>
<td>Others</td>
<td>53 (17,3%)</td>
</tr>
<tr>
<td>kPa (SWE)*</td>
<td>6,3 (4,6-9,6)</td>
</tr>
</tbody>
</table>

*Values are expressed as medians (interquartile range)
<table>
<thead>
<tr>
<th></th>
<th>No advanced fibrosis</th>
<th>Advanced fibrosis (F3-F4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smooth</td>
<td>41/148 (27,7%)</td>
<td>9/97 (9,3%)</td>
</tr>
<tr>
<td>Irregular</td>
<td>92/148 (62,2%)</td>
<td>38/97 (39,2%)</td>
</tr>
<tr>
<td>Nodular</td>
<td>15/148 (10,1%)</td>
<td>50/97 (51,5%)</td>
</tr>
<tr>
<td>Dilated portal vein (&gt;13 mm)</td>
<td>25/147 (17%)</td>
<td>36/97 (37,1%)</td>
</tr>
<tr>
<td>Splenomegaly (&gt;120 mm)</td>
<td>22/148 (14,9%)</td>
<td>39/97 (40,2%)</td>
</tr>
<tr>
<td>≥ 20 cm/s</td>
<td>16/41 (39%)</td>
<td>10/41 (24,4%)</td>
</tr>
<tr>
<td>20 - 15 cm/s</td>
<td>19/41 (46,3 %)</td>
<td>20/41 (48,8%)</td>
</tr>
<tr>
<td>14,9 - 10 cm/s</td>
<td>6/41 (14,6%)</td>
<td>11/41 (26,8 %)</td>
</tr>
<tr>
<td>≤ 10 cm/s</td>
<td>0/41 (0%)</td>
<td>0/41 (0%)</td>
</tr>
</tbody>
</table>

Table 2.
CONCLUSIONS:
The presence of sonographic cirrhosis and portal hypertension signs seem to be more frequent in patients with advanced cirrhosis in SWE. However, the strength of this possible association is unclear and more studies are needed.
DIAGNOSTIC ACCURACY OF LIVER AND SPLEEN STIFFNESS MEASURED BY FIBROSCAN® IN THE PREDICTION OF ESOPHAGEAL VARICES IN HCV-RELATED CIRRHOSIS PATIENTS TREATED WITH ORAL ANTIVIRALS

Mrs. Carolina Muñoz¹, Ms. Lidia Cuevas¹, Mrs. Maria Amo¹, Ms. Maria Luisa Manzano¹, Mrs. Ana Martin¹, Mrs. Raquel Muñoz¹, Dr. Gregorio Castellano¹, Mrs. Inmaculada Fernández¹
¹Hospital 12 De Octubre, Madrid, España

OBJECTIVES: The aim of this study was to investigate the accuracy of liver and spleen stiffness measurement (LSM, SSM) by transient elastography (TE) for the prediction of gastroesophageal varices (GEV) in patients with HCV-associated cirrhosis treated with new direct-acting antiviral agents (DAA).

METHODS: We performed a cross-sectional observational study that included patients with compensated HCV-related cirrhosis who had achieved sustained virological response after DAA therapy. Patients underwent LSM, SSM, abdominal ultrasound and esophagogastroduodenoscopy. Clinical and laboratory data and non-invasive markers such as the liver stiffness–spleen diameter to platelet ratio score (LSPS), variceal risk index (VRI) and platelet count to spleen diameter ratio (PSR) were analyzed. Receiver operating characteristic curves from non-invasive parameters and values of sensitivity, specificity, positive and negative predictive value, and likelihood ratio were also calculated.

RESULTS: Seventy-five consecutive patients were included, 42 males (56%), with a mean age of 63 years. LSM (12.8 vs 21.5; \( P = 0.003 \)), SSM (32 vs 46.05; \( P = 0.01 \)), LSPS (0.93 vs 2.22; \( P = 0.0003 \)), PSR (1272.7 vs 829.7; \( P = 0.01 \)) and VRI (-3.9 vs -1.02; \( P = 0.0004 \)) showed significant differences between patients without/with GEV. The best cut-off value to discard the presence of GEV was 11.4 kPa for LSM and 39.1 kPa for SSM. However, diagnostic accuracy was moderate (AUROC: 0.606 and 0.644 respectively). Combining TE measurements (LSM and SSM) or Fibroscan® results with other non-invasive parameters did not improve significantly the overall performance.

CONCLUSIONS: LSM and SSM showed suboptimal results for non-invasive assessment of GEV in HCV cirrhotic patients treated with DAA. Combining LSM with other non-invasive parameters seems to improve the diagnostic performance of TE marginally. Our results suggest that non-invasive methods cannot substitute standard procedures for predicting GEV in this population.
QUANTIFICATION OF UTERINE MOTION AND STRAIN BY ULTRASOUND SPECKLE TRACKING FOR PREDICTION OF EMBRYO IMPLANTATION

Mrs. Federica Sammali¹, Mrs. Celine Blank²,³, Mr. Yizhou Huang¹, Prof. Dick Schoot²,³, Prof. Massimo Mischi¹

¹Eindhoven University Of Technology, Eindhoven, Netherlands, ²Ghent University Hospital, Ghent, Belgium, ³Catharina Hospital, Eindhoven, Netherlands

Objectives
Along with the trend to postpone childbirth, the rate of couples dealing with infertility is approaching 20%. Against this problem, in-vitro fertilization (IVF) procedures are advancing. Yet, their success rate remains below 30%. There is evidence of a major role of uterine motion in fertilization outcome, but solutions for uterine motion analysis are lacking. We propose a dedicated method for quantification of uterine motion and strain by speckle tracking in B-mode transvaginal ultrasound (TVUS). The method is tested for its ability to distinguish between the different phases of a natural menstrual cycle and, most importantly, for its ability to predict successful embryo implantation in IVF.

Methods
Speckle tracking is implemented by block matching. Singular-value-decomposition filtering is tuned to extract the uterine-motion components. Speckle tracking is further accelerated by a diamond search. The method feasibility was first tested in 9 healthy women. 4-min TVUS scans were acquired in each woman at 4 different phases of the menstrual cycle by a WS80A scanner (Samsung) equipped with a transvaginal V5-9 probe. Motion and strain were calculated along the longitudinal and transversal direction in the sub-endometrial layer. Frequency and amplitude features were extracted from these signals and evaluated (two-tailed Student’s t-test) for their ability to discriminate between active and quiescent phases. Similarly, 16 women were analyzed during their IVF cycle and the extracted features evaluated as predictors of embryo implantation.

Results
Among the considered features, median and contraction frequency showed significant difference (p<0.05) between active (late follicular) and quiescent (menses and late luteal) phases. The contraction frequency also showed the ability to distinguish between successful and unsuccessful embryo implantation (p<0.05) already before embryo transfer.

Conclusions
Although more extensive validation is required, our results show the feasibility of uterine motion/strain quantification, providing a valuable tool to improve clinical decision making in IVF procedures.
CORRELATION STUDY BETWEEN OVERFLOW TIME OF FALLOPIAN TUBE FIMBRIAE IN HYSTEROSALPINGOGRAPHY AND NATURAL PREGNANCY OUTCOME

Dr. Weiqun Wang1, Dr. Qiulan Zhou1
1The Third Affiliated Hospital Of Guangzhou Medical University, Guangzhou, China

Objective: To explore the clinical application value of the duration of umbrella end overflow in evaluating the function of fallopian tubes by analyzing the correlation between the time of hysterosalpingography and natural pregnancy outcome.

Methods: Selected from January 2017 to April 2018 infertility reproductive outpatient clinic of 153 patients, the uterus oviduct contrast-enhanced ultrasound inspection, record the oviduct umbrella end of overflow time and ovarian ring often surrounded pelvic dispersion characteristics of overflow time. According to CEUS of uterine fallopian tube the contrast agent in oviduct umbrella end different, divided into 3 groups, 1 group less than 48 seconds, 2 group 48 seconds overflow group, the patients were followed up for 1 year to observe the pregnancy rate between different groups, and the correlation between the time of hysterosalpingography umbrella end overflow and the natural pregnancy outcome was analyzed.

Results: There were statistically significant differences between the two groups ($\chi^2=44.538, P<0.05$). There were statistically significant differences in the success rate of spontaneous pregnancy between different groups ($\chi^2=46.217, 45.739, P<0.05$). There was no statistically significant difference ($P>0.05$) in the success rate of spontaneous pregnancy between the same groups of left and right oviducal CEUS. The results of multiple Logistic regression analysis showed that the rapid overflow time of the umbrella end of bilateral salpinx was the influencing factor of natural pregnancy outcome ($P<0.05$). The area under the ROC curve was 0.873 [95%CI(0.847, 0.914)].

Conclusion: There is a correlation between the rate of spontaneous pregnancy and the rate of spontaneous pregnancy.

Hysterosalpingography can be used to observe the overflow time of the imaging fluid at the end of the oviduct, which can indirectly reflect the oviduct oviposit function, and provide a more effective basis for clinical treatment.

Keywords: hysterosalpingography; fimbriae of uterine tube; natural pregnancy
A: Hysterosalpingography imaging showed no contrast media overflow at the left fallopian tube fimbriae at 45s (< 48 seconds)
B: Contrast media overflow at the left fallopian tube fimbriae at 50s (> 48 seconds) after continuous pressurization
ANALYSIS OF TUBAL OCCLUSION REGION PROPORTION IN TRANSVAGINAL FOUR-DIMENSIONAL HYSTERO SALPINGO CONTRAST SONOGRAPHY

Dr. Weiqun Wang¹, Dr. Qiulan Zhou¹
¹The third affiliated hospital of guangzhou medical university, Guangzhou, China

Objectives: Analyze the proportion of proximal, middle and distal tubal occlusion region in transvaginal four-dimensional hysterosalpingo contrast sonography (TV 4D-HyCoSy), and explore the common causes of tubal obstruction.

Methods: Retrospective analysis of 2514 female infertile patients performed TV 4D-HyCoSy in our hospital in 2018 January to 2018 December. The examination results showed that 823 patients were unilateral or bilateral tubal obstruction (32.7%, 823/2514). The composition ratio of proximal, middle and distal obstruction is calculated. The coincidence rate of fallopian tube obstruction was compared with laparoscopic chromopertubation (LAP) in sixty-two patients.

Results: In the 823 patients, 44 fallopian tubes were removed due to ectopic pregnancy or ligated. Of the remaining 1602 tubes, obstruction account for 36.96% (597/1602). Of which 223 tubes were proximal obstruction (37.35%, 223/1602), 57 fallopian tubes were middle obstruction (9.55%, 57/1602) and 317 fallopian tubes were distal obstruction (53.10%, 317/1602). Statistics showed that the coincidence rate of 4D-HyCoSy with LAP for diagnosis of tubal obstruction was 94.3% (117/124), the sensitivity was 90.1% (51/56), and the specificity was 94.1% (64/68).

Conclusions: Distal tubal obstruction is most common, which is mostly caused by the adhesion of tubal fimbria due to pelvic inflammation. Followed is proximal tubal obstruction, which is mostly caused by the adhesion of the fallopian tube opening and the blockage of mucous plug. The middle tubal obstruction is mostly caused by scar formation after conservative treatment or incision and embryo extraction of ectopic pregnancy.
SPECIFICALLY ERADICATING CANCER-ASSOCIATED FIBROBLASTS WITH A TENASCIN C TARGETED AND DOXORUBICIN LOADED ULTRASONIC NANOBUDDLE

Prof. Jie Li
Qilu Hospital Of Shandong University, Jinan City, China

Objectives The present study aims to develop a novel CAFs-targeted ultrasonic nanobubble loading doxorubicin (DOX) for cancer therapy.

Methods DOX-loaded nanobubbles modified with FH peptide (FH-NB-DOX), which specifically binds to tenascin C, a protein mainly expressed by CAFs, were prepared through the methods of mechanical shaking and low-speed centrifugation based on lipid-stabilized perfluoropropan. The bubble size and distribution range were measured by dynamic light scattering (DLS). Enhanced imaging ability was evaluated using a custom-made agarose mold with a clinical US imaging system at mechanical indices of up to 0.12 at a center frequency of 9.0 MHz. The WPMY-1 cells treated with TGF-β1 for 12 hours at a concentration of 5 ng/ml were used as the CAFs model in this study. Targeted ability was carried out in CAFs by fluorescence microscopy and fluorescent-activated cell sorting (FACS).

Results FH-NB-DOX with a particle size of 218nm were successfully prepared, and they showed superior contrast imaging effect. FH-NB-DOX achieved higher cellular targeting compared with non-targeted NB-DOX, and also exhibited stronger cytotoxicity in vitro compared with NB-DOX and free DOX under ultrasound irradiation. Furthermore, the conditioned medium from CAFs treated with FH-NB-DOX significantly inhibited the proliferation of PC-3 cells than NB-DOX and free DOX group.

Conclusions In conclusion, a new type of CAFs-targeted ultrasonic nanobubble named FH-NB-DOX was successfully prepared, and this nanobubble could deliver more DOX to CAFs and may offer a potential strategy for cancer therapy based on CAF-targeting.
DEVELOPMENT OF SMART CHARGE-CONVERSION AND ULTRASOUND-RESPONSIVE O-CARBOXYMETHYL CHITOSAN NANODROPLETS WITH IMPROVED STABILITY AND CONJUGATING ABILITY TO TUMOR CELLS

Prof. Jie Li

Qilu Hospital Of Shandong University, Jinan City, China

Objectives The present study aims to develop an ultrasound sensitive O-carboxymethyl chitosan (O-CS)/perfluorohexane nanodroplet loading doxorubicin (DOX) for cancer therapy.

Methods The nanodroplets were developed via nano-emulsion process with high-speed homogenizer. The size, distribution range of the nanodroplets were measured through dynamic light scattering. The surface charge of O-CS NDs at different pH values was measured by Zeta Potential Analyzer. Hemolysis assay, protein absorption, fluorescent-activated cell sorting and fluorescence microscopy were carried out to investigate the advantages of O-CS NDs compared with NDs formed by common chitosan. Enhanced ultrasound imaging ability was evaluated in water bath with a clinical diagnosis ultrasound (US) imaging system. The doxorubicin-loading O-CS NDs (O-CS-DOX NDs) were also synthesized and preliminarily studied.

Results O-CS NDs developed in this study were spherical in shape with core-shell structure and with an average diameter of 182.8 ± 9.4 nm. These negatively charged nanodroplets at physical pH value (7.4) showed good stability by resisting serum protein absorption. Moreover, the surface charge of the nanodroplets tuned to positive in weak acid tumor microenvironment (6.3). The results of fluorescence microscopy and FACS showed O-CS NDs at pH 6.3 achieved higher cellular conjugation abilities compared with O-CS NDs at pH 7.4 and CS NDs at both pH values. O-CS NDs exhibited superior contrast imaging effect via acoustic droplet vaporization using a clinical US imaging system. At an optimal DOX concentration (1.5mg/ml), the Entrapment Efficiency was 92.2% and the Loading Efficiency was 47.2%.

Conclusions these stable, safe and smart O-CS NDs may be a promising approach to improve the circulation and cell conjugating efficiency as an effective ultrasound molecular imaging and cancer-targeting drug delivery system in cancer therapy.

In conclusion, a new type of CAFs-targeted ultrasonic nanobubble named FH-NB-DOX was successfully prepared, and this nanobubble could deliver more DOX to CAFs and may offer a potential strategy for cancer therapy based on CAF-targeting.
CAN SMI PREDICT RENAL FIBROSIS AND REPLACE RENAL BIOPSY?

Dr Suheil Artul  
1Emms Hospital Nazareth, Nazareth, Israel, 2Radiology department EMMS Hospital Nazareth, The Azriely Faculty of medicine, Nazareth, Israel

Abstract

Background: Superb microvascular imaging (SMI) is an innovative Doppler ultrasound technique that allows better visualization of small branching vessels by using a unique algorithm that offers high frame rates, less clutter which were not previously possible without the use of contrast agent.

Our Hypothesis: can SMI provide sufficient information regarding the severity of chronic kidney disease and reflecting the fibrotic changes.

Purpose: To evaluate the usefulness of SMI in the diagnosis of kidney fibrosis. The SMI was performed in patients with chronic kidney diseases (CKD) stage 1-5 where some of them underwent biopsy proven chronic kidney disease and fibrosis in close time the use of SMI examination, as part of the diagnosis and therapeutic judgment as needed. In addition, biochemical tests were performed in order to obtain the serum parameters of kidney function (Blood Urea Nitrogen-BUN, Serum Creatinine-SCr), a urine collection test for the assessment of proteinuria, and estimation of Glomerular Filtration Rate (GFR) by Modification of Diet in Renal Disease (MDRD) formula in patients with chronic kidney diseases at various stages (1-5). Fifteen healthy subjects with normal kidney function were served as the control group.

After collecting all the mentioned data, we calculated the correlation analysis with SMI findings in order to assess whether SMI is sensitive and specific enough in diagnosing and detecting renal fibrosis and if potentially it could replace renal biopsy.

Methods: All 45 patients and 15 in the control group were subjected to the innovative ultrasound technique namely Superb microvascular imaging (SMI) of Toshiba Medical Systems, Tokyo, Japan. Specifically, we used Apio 500 ultrasound system with a 7-MHz or 12-MHz linear probe and were assessed the vascular shape, the ramifications and irregularity, and the vascular index of five randomly selected area of each examined kidney.

Results:

There were good correlations between SMI vascular indexes, shape of cortical vessels, and between the serum creatinine level and GFR.

Conclusion: SMI has the potential of predicting renal fibrosis and may predict the stage of fibrosis and in consequences change therapy. And we think that SMI can replace renal biopsy in some cases.
ICTERICIA OBSTRUCTIVA SECUNDARIA A OCLUSIÓN PAPILAR POR PRÓTESIS GASTRODUODENAL.

Dr. Eugenia Sánchez Rodríguez1, Dr Raquel Ríos León1, Dr Carolina González Olivares1, Dr Elena Garrido Gómez1, Dr Miguel García González1, Dr Agustín Albillos1

1Hospital Ramon y Cajal, madrid, España

Introducción: las prótesis metálicas son una opción terapéutica paliativa en la obstrucción tumoral del vaciamiento gástrico. Se ha descrito la aparición de ictericia obstructiva por migración de los dispositivos. La ecografía constituye el primer escalón diagnóstico en este escenario.

Caso clínico: paciente de 60 años con Linfoma del manto de localización gástrica que ingresó por intolerancia oral. Se realizó endoscopia digestiva alta que confirmó afectación tumoral difusa de la mucosa gástrica hasta la segunda porción duodenal estenosis antral. La región papilar estaba respetada. Se colocó una prótesis metálica parcialmente cubierta, tras lo cual se constató progresiva elevación de bilirrubina y colestasis. Se realizó una ecografía abdominal que reveló una vesícula biliar distendida(104 mm) con contenido litiásico y dilatación de vía intra y extrahepáticas(10mm)e identificó la prótesis gastroduodenal a través de la que existía paso de contenido y cuyo extremo distal se encontraba adyacente a la desembocadura del colédoco(imagen1) e realizó nueva que confirmó la obstrucción papilar migración de la prótesis que fue retirada, salida de barro y material purulento a través del orificio papilar. No existía infiltración tumoral a nivel papilar. Se comprobó la mejoría analítica y ecográfica tras la intervención.

Discusión: la colocación de prótesis metálicas es una alternativa eficaz para el tratamiento paliativo de la obstrucción al vaciamiento gástrico de origen tumoral. Tras su colocación, la aparición de ictericia y colestasis pueden estar relacionadas con infiltración tumoral de la región papilar o con la migración del dispositivo.
La ecografía abdominal constituye el primer escalón diagnóstico en el paciente con ictericia obstructiva. Tiene una alta sensibilidad para detectar la dilatación de los conductos biliares intra y/o extrahepáticos, permitiendo en ocasiones detectar el lugar y la causa de la obstrucción.
Oral presentations
El “ÍNDICE ELASTOGRAFICO BAZO-HÍGADO” ES LA MEJOR HERRAMIENTA NO INVASIVA PARA EL DIAGNÓSTICO DE LA HIPERTENSIÓN PORTAL IDIOPÁTICA.

Dr. Carolina González-Olivares1, Dr. Luis Tellez1, Dr. Enrique Rodríguez-Santiago1, Mrs. María Torres1, Dr. Javier Martínez1, Dr. Miguel Ángel Rodríguez-Gandía1, Dr. Eugenia Sanchez1, Dr. Alexandre Figueroa-Tubio1, Dr. Irene García de la Filla1, Dr. Rubén Sánchez-Aldehuelo1, Dr. Elena Garrido1, Dr. Miguel García1, Dr. Francisco Gea1, Dr. Agustín Albillos1

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INTRODUCCIÓN:
El diagnóstico diferencial de la hipertensión portal idiopática (HPI), cirrosis hepática (CH) y hepatitis crónica (HC) es complejo y requiere de pruebas invasivas (biopsia y estudio hemodinámico). En este trabajo investigamos si la medición simultánea de elastografía esplénica (EE) y hepática (EH) mediante Fibroscan® facilita el diagnóstico no invasivo de la HPI.

MÉTODO:
Estudio unicéntrico, observacional, prospectivo y analítico. Incluimos pacientes con CH, HC, HPI y trombosis portal no cirrótica (TPNC). Recogimos variables clínicas, analíticas, ecográficas, EE y EH entre 01/02/2017 - 01/02/2019.

RESULTADOS:
Se incluyeron 107 pacientes: HPI(23); CH(39); HC(25); TPNC(20). Los pacientes con HPI presentaban valores de EH inferiores a los pacientes con CH (7,9 [5,3-9,9] vs 27,0 [21,3-43,5] kPa (p<0,01)), superiores a los de HC (5,2 [4,8-7,8] p=0,02) y similares a los de TPNC (8,6 [4,8-7,8] p=0,2). No se encontraron diferencias en el valor de EE entre los pacientes con HPI, CH y TPNC, pero fue significativamente superior al de los pacientes con HC (72,0 [48-75] vs 23,4 [18,3-28,7] kPa (p=0,01)). El cociente EE/EH permitió diferenciar los pacientes con HPI de aquellos con CH (AUROC 0,99 [0,97-1,00], p<0,01), con una sensibilidad de 0,95 y especificidad de 0,97 para un punto de corte de 4,1. También permitió diferenciar los pacientes con HPI de aquellos con HC (AUROC 0,84 [0,71-0,93]), con una sensibilidad de 0,96 y especificidad de 0,95 para un punto de corte de 4,1. Entre los pacientes con HPI y TPNC no hubo diferencias. Globalmente, el cociente EE/EH permitió diferenciar aquellos pacientes con HPI de los pacientes con CH o HC (AUROC 0,85 [0,78-0,92], p<0,01), con una sensibilidad de 0,95 y especificidad de 0,69 para el punto de corte de 4,15.

CONCLUSIONES:
El “índice elastográfico bazo-hígado” es el mejor parámetro no invasivo para el diagnóstico diferencial de HPI, CH y HC. Un valor de EE/EH de 4,1 permite diferenciar adecuadamente estos grupos de pacientes y orientar el diagnóstico de forma rápida y sencilla.

FIGURAS:
Figura 1. Diferencia de los parámetros elastográficos entre grupos
Oral presentations
Figura 2. Curvas ROC para el diagnóstico diferencial de hipertensión portal idiopática vs cirrosis vs hepatitis crónica.

Figura 3. Curvas ROC para el diagnóstico diferencial de los parámetros elastográficos para hipertensión portal idiopática vs el resto de pacientes.
INTRODUCTION AND AIM
Gastrointestinal ultrasound (GIUS) findings in infectious enterocolitis are commonly unspecific. Some frequent patterns are parietal thickening, preserved layered structure, free intraabdominal fluid and colour Doppler hyperaemia. However, the differential diagnosis of the causal microorganism through US is difficult. Our aim was to investigate the differential patterns in GIUS in infectious enterocolitis.

MATERIALS AND METHODS
Retrospective and descriptive study of US findings in infectious diarrhoea in a tertiary centre. We included patients with suspected infectious diarrhoea between 2017-2018 confirmed by GIUS and microbiology assessment.

RESULTS
Infectious diarrhoea was confirmed by GIUS and microbiology assessment in 17 of 110 (15.5%) patients initially suspected to have it. *Salmonella* *no tiphy* was isolated in 6/17, *Clostridium difficile* in 4/17, CMV in 2/17 and *Yersinia enterocolitica* in 1/17. In 4/17 there was high suspicion of infectious disease but cultures were collected after the beginning of antibiotic treatment.

The most frequent colonic pattern was pancolitis (with or without ileum involvement) (6/17), followed by left colitis (5/17) and terminal ileitis (4/17). We found parietal thickening in all patients, colour Doppler hyperaemia in 76.5% (13/17), free liquid in 23.5% (4/17), layered structure loss in 17.6% (3/17) and submucosa enhancement in 23.5% (4/17).

The 4 cases caused by *Cl. Difficile* presented higher severity signs: all of them had pancolitis and intense hyperaemia demonstrated by colour Doppler mode, intraperitoneal free fluid was found in 3/4 and layered structure loss in 2/4. The cases caused by *Salmonella spp.* frequently involved terminal ileum (50%) and presented submucosal thickening (50%). Enterocolitis by *Yersinia* involved terminal ileum and right colon and presented multiple adenopathies (Fig. 2).
CONCLUSION
Our study showed similar results than previous series. A systematic GIUS using Doppler colour assessment is useful to establish the diagnosis of infectious enterocolitis and could help suspect the causal microorganism.
CORRELACIÓN ENTRE LA ECOGRAFÍA HEPÁTICA Y EL PARÁMETRO DE ATENUACIÓN CONTROLADA (CAP) POR ELASTOGRAFÍA DE TRANSICIÓN CON LA ANATOMÍA PATOLÓGICA PARA EL DIAGNÓSTICO DE NAFDL. EXPERIENCIA EN NUESTRO CENTRO.

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Introducción
El NAFLD es una patología muy frecuente, cuyo diagnóstico y estadificación se realiza mediante biopsia hepática. En los últimos años, se han desarrollado distintos test alternativos no invasivos como la ecografía y la medición del CAP. Por ello nos propusimos evaluar el grado de correlación que presentan con la biopsia en nuestro centro.

Material y Métodos
Estudio retrospectivo de pacientes con diagnóstico de NAFLD entre 02/2018 y 02/2019. Se recogieron datos de biopsia, elastografía, CAP y ecografía realizados por personal entrenado. Se analizó la correlación entre ellos mediante índice de concordancia kappa (Cκ).

Resultados
Se incluyeron 30 pacientes (16:14 M:H), con una edad media de 59 años (41-78). La mediana de IMC fue de 35 (27-41). El porcentaje de esteatosis medio en la biopsia fue de 40% y la puntuación media del score NAS fue cercana a 4. El CAP medio fue de 344dB/s. El 73% de los pacientes obtuvieron una clasificación de S3, confirmando grado 3 de esteatosis en el 13% de las biopsias. La Cκ entre ambos fue de 0,042 (concordancia pobre). Sin embargo, al correlacionar los valores numéricos obtenidos en dB/s y el % de esteatosis en la biopsia se obtiene una correlación lineal con una r=0.653 (p<0.0001).

La fibrosis media obtenida en la biopsia fue de F2, siendo en elastografía F3. La media de Kpas obtenidos fue de 11,3. Se obtuvo un índice Cκ para ambos de 0,11 (concordancia pobre).

Por otro lado, se comparó el grado de esteatosis estimado mediante ecografía con el de la biopsia, obteniendo un índice Cκ de 0,48 (concordancia moderada).

Conclusión
En nuestra población, la concordancia del CAP con el grado de esteatosis medido mediante biopsia hepática fue pobre, mientras que la ecografía obtuvo mejores resultados con un grado de concordancia moderado.
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PSEUDOQUiste ASOCIADO A PANCREATITIS AGUda NECROTIZANTE: “EL SÍNDROME DEL DUCTO DESCONECTADO”

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INTRODUCCIÓN
La clasificación de Atlanta 2012 define al pseudoquiste pancreático (PQP) como una colección fluida asociada a una pancreatitis aguda (PA) edematosa que adquiere una pseudopared tras 4-6 semanas de evolución. Presentamos el caso de un PQP asociado a una PA necrotizante.

CASO CLÍNICO
Pancreatitis aguda biliar leve (Foto 1) en varón de 62 años, exfumador y consumidor de unos 30 g de etanol/día, que fue dado de alta a la espera de colecistectomía tras 5 días de ingreso hospitalario. Al mes sufrió un nuevo episodio de PA y en la ecografía abdominal se demostró una necrosis > 30% en cabeza-cuerpo de páncreas (ecografía contratada: Video 1) y una colección fluida (Fotos 3-4) en el saco menor de 20 cm que le ocasionaba epigastralgia postprandial e intolerancia alimenticia. En una RMN la colección fluida estaba rodeada de una pared fina y mostraba conexión con el conducto pancreatico principal (CPP) a nivel córporo-caudal (Foto 5). La bioquímica del líquido del interior del quiste presentaba una amilasa de 78780 UI/L y un CEA <0,5 ng/mL, y la citología fue negativa para malignidad Tras realizar una cistogastrostomía transgástrica guiada por ecoendoscopia y un drenaje endoscópico transpapilar, se logró reducir el PQP a 5 cm (Foto 6). En la actualidad (8 meses más tarde) el paciente está asintomático, colecistectomizado, la necrosis pancreática se ha licuado dando lugar a una colección de necrosis organizada de 6 cm (Foto 7) y el PQP mide 3.5 cm (Foto 8).

COMENTARIOS
La fuga pancreática como consecuencia de una rotura del CPP asociada a una PA necrotizante se caracteriza por dos hechos fundamentales: la colección de fluido o PQP se acompaña de un grado variable de necrosis (per) pancreática y la disrupción ductal suele ser completa dando lugar como en nuestro caso a un “Síndrome del Ducto Desconectado”.

Oral presentations
Rentabilidad de la ecografía en un caso de lumbalgia de causa infrecuente

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Caso clínico

Varón joven de 29 años con antecedente de criptorquidia infantil resuelto con orquidopexia, que consulta por lumbalgia izquierda, dolor y calambres en cara anterior de muslo de 4 meses de evolución, por lo que se le solicita RMN de columna que no aprecia lesiones óseas en columna vertebral, pero sí hidronefrosis grado II con adenopatías hiliares. Ingresa para estudio, solicitándole inicialmente ecografía digestiva que detecta una masa sólida de contornos irregulares de 80x56 mm en FII con vasos en su interior. Se añade contraste ecográfico, presentando captación en fase arterial incompleta con zona central no captante y lavado en fase venosa a los 50 segundos. Se decide realización de PAAF ecoguiada de la masa y de adenopatía inguinal izquierda que resultan positivas para seminoma. Conocido el diagnóstico, se practican TC abdomino-pélvico y ecografía escrotal que confirman la presencia de gran masa polilobulada en fosa iliaca izquierda sugestiva de conglomerado adenopático y una masa en bolsa escrotal izquierda, respectivamente. Se indica tratamiento quirúrgico mediante orquidectomía y posterior tratamiento quimioterápico.

Discusión

El seminoma es un tumor de las células germinales testiculares. Se considera el tumor sólido más frecuente en varones jóvenes (15-35 años), pero en valores absolutos es un tumor poco frecuente. Habitualmente se diagnostica de forma accidental como una masa testicular indolora, más frecuente en pacientes con criptorquidia. En nuestro caso, la presentación como masa abdominal compresiva (sobre uréter y nervio femorocutáneo) es poco habitual. La diseminación habitual del tumor es a retroperitoneo, pero en casos de orquidopexia, existe una alteración del drenaje linfático por la manipulación quirúrgica, presentando conglomerados adenopáticos inguinales, intraperitoneales y en hilio renal, lo que nos puede confundir con el linfoma y otros tumores. En nuestro caso la ecografía fue fundamental en el diagnóstico y el contraste apoyó la sospecha de malignidad.
CORRELATION BETWEEN THE FINDINGS OF THE SCREENING ECOGRAPHY IN CIRROTIC PATIENTS WITH
HEPATOCARCINOMA AND THE RESULTS OF THE CT AND MRI.

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Objectives:
Check the profitability of screening ultrasound in liver cirrhosis in our hospital.

Methods:
The screening ultrasounds of patients with hepatic cirrhosis diagnosed of hepatocarcinoma in CT or
abdominal MRI with intravenous contrast in the San Cecilio University Hospital between 2016 and 2019
have been reviewed.

Results:
32 hepatocarcinomas have been diagnosed on cirrhotic liver based on their suspicion on abdominal
ultrasound screening of patients with liver cirrhosis. In 93.75% of the cases, one or more nodules suspected
of hepatocarcinoma were visualized, so it was necessary to request for a later dynamic test (CT / MRI with
intravenous contrast). In two patients (6.25%) no nodules were visualized. In 53.12% of the cases, the
number of nodules visualized on the screening ultrasound coincided with the number of nodules
characterized by a dynamic imaging test (abdominal CT / MRI with intravenous contrast). The 21.87% of the
hepatocarcinomas were diagnosed in stage A of the BCLC (Barcelona Clinic Liver Cancer) receiving curative
treatment by means of tumor resection or liver transplantation.

Discussion / Conclusions:
The data from our study corroborate that abdominal ultrasound is the best screening test, since nodules
were visualized on ultrasound in 93.75% of hepatocarcinomas diagnosed. However, it is not a perfect test,
since only in 53.12% of the cases the number of nodules coincided with those visualized by CT / MRI and
21.87% were in an early stage. In this sense, contrast ultrasound (CEUS) allows a better characterization of
the lesion, its size and location, the presence of other lesions in the parenchyma and perform a differential
diagnosis. In conclusion, abdominal ultrasound is currently the best screening test for hepatocarcinoma in
patients with liver cirrhosis, due to its availability, economy, low invasiveness and irradiation. In the latest
clinical guidelines for hepatocarcinoma (EASL 2018), CEUS is presented as an alternative diagnostic method
when CT and MRI are inconclusive.
UTILITY OF DOPPLER ULTRASOUND IN HYPERBILIRUBINEMIA DIFFERENTIAL DIAGNOSIS AFTER LIVER TRANSPLANTATION

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CASE REPORT
We present the case of a 47-year-old male with HIV infection and hepatitis B virus plus alcoholic cirrhosis, with a splenomegaly of 21 cm, who underwent liver transplantation (LT) on October 2018. In the following days after LT, he experienced an increase in bilirubin levels associated with a respiratory infection, which markedly improved with antibiotic therapy. However, a week later bilirubin started to increase again, reaching almost 60 mg/dl. Hepatic arterial thrombosis and biliary tract obstruction were discarded. Cytomegalovirus reactivation was evidenced and a liver biopsy showed cholestasis changes probably related to pharmacological toxicity. However, despite Valganciclovir treatment and the withdrawal of toxic drugs, there was not a decrease in bilirubin, so alternative diagnoses were raised. As the patient presented significant splenomegaly prior to transplantation, splenic arterial steal syndrome was suspected. Doppler ultrasound found an increased splenic arterial flow compared to a decreased hepatic arterial flow (Figure 1) which was consistent with the diagnosis. Therefore, partial splenic embolization was performed. Afterwards, in Doppler sonography, a significant increase in hepatic arterial velocity and a decrease in the arterial resistance index compared with pretreatment values were seen. Consequently, bilirubin levels began to progressively decrease, reaching normal values after six weeks.

DISCUSSION
Post-LT jaundice is a common disorder which can be due to multiple causes. Doppler sonography is very useful in the evaluation of presence of biliary and vascular abnormalities in these patients. Splenic arterial steal syndrome is a rare cause of liver dysfunction following LT in which dynamic changes in the hepatic arterial waveform and resistance index can be detected by Doppler ultrasound, with a concomitant increase in splenic arterial flow. Accordingly, Doppler ultrasound is a very useful imaging modality in early detection of splenic steal syndrome, which is crucial for preventing progression into graft failure.

Figure 1. Doppler sonograms showing an increased splenic arterial flow (A) compared to a decreased hepatic arterial flow (B).

A.
Oral presentations
INTRODUCCIÓN
La colecistitis aguda es la patología inflamatoria más frecuente de la vesícula biliar. La perforación vesicular (PV) es una complicación infrecuente (2-11%), siendo la técnica gold estándar para su diagnóstico la tomografía computarizada (TC) con contraste.

CASO CLÍNICO
Presentamos el caso de un varón de 69 años con antecedentes de diabetes mellitus, miocardiopatía dilatada y adenocarcinoma de sigma en estadio IV con progresión tras tratamiento quimioterápico. Ingresó por hemorragia digestiva alta secundaria a úlcera duodenal objetivándose una elevación de las enzimas de colestasis en la analítica. Se realizó una ecografía abdominal visualizándose una vesícula biliar con tamaño en el límite alto de la normalidad (9x4 cm) y paredes engrosadas de forma irregular (6.5 mm), con membranas y material hiperecogénico en su interior, así como líquido perivesicular y perihepático (figura 1). Se administró contraste intravenoso (CEUS) visualizándose captación irregular de la pared vesicular en fase arterial y un área de disrupción en el fundus vesicular que contactaba con el área de líquido libre descrita previamente. El material intravesicular no captaba sugiriendo detritus (figura 2). Se solicitó TC abdominal que confirmó la sospecha diagnóstica de PV (figura 3) siendo tratado de manera conservadora.

DISCUSIÓN
La ecografía es la técnica inicial de elección para el estudio de la patología vesicular. Los signos ecográficos que pueden orientar a la PV son engrosamiento o irregularidad de la pared, siendo evidente si existen coleciones perivesiculares o interrupción focal de la pared. CEUS es una técnica accesible, no invasiva y fácilmente reproducible, que ha mostrado utilidad y precisión en el diagnóstico de PV, permite una mejor caracterización de la pared vesicular (hiperecogénica durante la fase arterial) y de la presencia de complicaciones.

FIGURAS
FIGURA 1. Ecografía modo B Vesícula biliar de pared engrosada con formaciones digitiformes hacia la luz vesicular.
FIGURA 2. CEUS: Pared vesicular (línea hipercaptante) con disrupción a nivel de fundus sugiere perforación vesicular.

Oral presentations
FIGURA 3. TC abdominal (corte axial). Se identifica solución de continuidad a nivel de la pared vesicular que se corresponde diagnóstico de perforación vesicular sospechado en la ecografía.
Introducción
Una inserción anormalmente baja del ligamento arcuato medio (LAM) diafragmático puede comprimir la salida del tronco celiaco (TC) y ocasionar un síndrome caracterizado por epigastralgia postprandial con pérdida ponderal. Este síndrome tiene una incidencia de 2 casos por 100.000 habitantes y es más frecuente en mujeres jóvenes.

Caso clínico
Mujer de 80 años con dolor abdominal postprandial que se acompaña de sudoración fría, mareo y pérdida ponderal de más de 8 kg en los últimos meses. Entre los antecedentes personales destaca una HTA, una dislipemia y un bypass aortobifemoral en 2005. En la ecografía abdominal se observa una estenosis de la salida del tronco celiaco (imagen 1) sin dilatación distal pero con un marcado cambio de velocidad al aplicar doppler pulsado en el segmento postestenótico (imagen 2), así como un cambio significativo de la velocidad en la estenosis con la dinámica respiratoria, de forma que esta velocidad disminuye en inspiración "al aliviarse la compresión sobre el TC" (imagen 3) y se incrementa en espiración al tornarse redundante y "potenciarse la compresión sobre el TC" (imagen 4). En un angioTAC se demuestra un marcado engrosamiento del LAM y una estenosis significativa de la salida del TC (2mm) que afecta a un segmento corto del mismo (6-7mm) y no asocia dilatación distal (6mm) (imagen 5). Con el diagnóstico de Síndrome de LAM la paciente fue remitida a Cirugía Vascular para valoración de tratamiento.

Conclusiones
La ecografía abdominal nos permite confirmar el diagnóstico de un SLAM sintomático de una forma no invasiva y fiable al demostrar una estenosis del TC que se acentúa durante la espiración y se alivia durante la inspiración.
DEVELOPMENT OF PORTAL VEIN THROMBOSIS IN IDIOPATHIC NONCIRRHOTIC PORTAL HYPERTENSION DETECTED BY ABDOMINAL ULTRASOUND

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INTRODUCTION AND AIM
Idiopathic noncirrhotic portal hypertension (INCPH) is a rare disorder characterized of intrahepatic portal hypertension in the absence of liver disease. The development of portal vein thrombosis (PVT) is common with a reported prevalence that ranges from 13-46% and a higher incidence compared to patients with cirrhosis. Abdominal ultrasound (aUS) is considered a very useful technique to rule out this complication. Our aim was to review the incidence and outcomes of PVT in INCPH.

MATERIALS AND METHODS
Retrospective and descriptive study of the development of PVT detected by aUS in patients with diagnosis of INCPH in the three years (2015-2018) at a tertiary centre.

RESULTS
We included thirty patients in which the diagnosis of INCPH was confirmed by liver biopsy. 8/30 cases (26.7%) of PVT or cavernous portal transformation (CPT) were detected. When the diagnosis was established, 4/8 patients (50%) already presented PVT and one had developed CPT. The remaining three (37.5%) developed thrombosis during the follow-up.
Two subjects had focal branch PVT while five patients presented extense portal, splenic and/or mesenteric thrombosis. The occlusion was complete in four cases and partial in three.
Six subjects were treated with anticoagulant therapy. In spite of it, two of them developed CPT probably related to prothrombotic states and larger extension of the thrombosis. In the remaining, thrombosis did not disappear, but remained stable.

CONCLUSION
In our study, the overall rate of PVT detected by US in patients with INCPH was similar to previous series. Prothrombotic states and larger extension of the thrombosis were the main features related to the development of CPT. Consequently, we support that abdominal ultrasound is an excellent method to detect and follow-up this complication.
CURRENT STATUS OF CONTRAST-ENHANCED HARMONIC ENDOSCOPIC ULTRASOUND IN SPAIN

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Objective: The main objective of the study is to obtain, for the first time in Spain, an accurate picture of the current status of contrast-enhanced harmonic endoscopic ultrasound (CEH-EUS).

Materials and Methods: Along 2018, email surveys were sent to the members of the Spanish Endoscopic Ultrasound Club and to other colleagues who usually do this technique but are not members of the Club. The answers were analysed using widespread statistical tools.

Results: In a first stage (March 2018), a total of 92 surveys were sent. Of these, 45 were answered. 49% did not have CEH software but they would like to have it, 24% had the specific software and used it. 11% had the software but did not use it in their clinical practice. In a second time (December 2018) the same survey was sent to see if there had been any change. 34.7% had the software and of them 82.4% used it in their clinical practice. The main indication is the study of pancreatic lesions and most of the endosonographers use a dose of 4.8 ml of sulphur hexafluoride.

Conclusion: Nowadays, most of the Spanish endosonographers do not have CEH software but they would like to have it. Therefore, we expect there will be substantial changes in the use of the technique in public and private hospitals in Spain.
CEUS LI-RADS Y CHC. EXPERIENCIA EN UNA UNIDAD DE ECOGRAFÍA DIGESTIVA

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Introducción:
Valorar en nuestra experiencia, el grado de concordancia del sistema de clasificación CEUS LI-RADS en nódulos tipificados como hepatocarcinoma según el patrón oro determinado.

Métodos:
Estudio descriptivo retrospectivo, de las lesiones ocupantes de espacio (LOES) mayores de 1cm detectadas durante seguimiento de los pacientes con cirrosis hepática, entre enero de 2017 y marzo de 2019, en la Unidad de ecografía digestiva del Hospital Virgen de la Arrixaca. Se recogieron el sexo, tamaño, comportamiento en CEUS y clasificación CEUS LI-RADS. Los patrones de referencia fueron la histología y TC o RMN con contraste orgánospecífico. Se excluyeron aquellos con datos incompletos, dos hepatocarcinomas difusos y en los multifocales, solo se incluyó el nódulo estudiado con CEUS. Las lesiones clasificadas como LR1 y LR 2 no fueron incluidas, por haberse confirmado su naturaleza benigna o por estar aún en seguimiento.

Un total de 72 nódulos fueron clasificados según el sistema LI-RADS en: LR-3, LR-4, LR-5, LR-M, LR-TIV.

Resultados:
La edad media fue de 64,6 años, 87% hombres y 13% mujeres. El tamaño medio de las LOES fue 3.2 cm. De los 72 nódulos, 58 (88.5%) fueron CHC confirmados, por histología (63,8%), o bien con TC o RMN (36,2%). 33 lesiones clasificadas como LR-5,31 (93.9%) fueron CHC. 20 lesiones catalogadas como LR-4, 14 (70%) fueron CHC. 9 lesiones clasificadas como LR-3, resultaron ser CHC de ellas (44.4%). En el 100% de los LR-TIV se confirmó CHC y trombosis tumoral. De los 5 nódulos clasificados como LR-M, 3 fueron lesiones malignas (2CHC, 1 colangiocarcinoma intrahepático) y 2 se clasificaron como LR-3 en RMN, en seguimiento actualmente.

Discusión:
En nuestra experiencia, los resultados de aplicar la clasificación CEUS LI-RADS se ajustan a la literatura, con una concordancia para hepatocarcinoma del 94% para LR-5 y 100% para LR-TIV. Algunos CHCs pueden tener clasificarse como LR-M.
RESULTADOS Y TENDENCIAS DE USO EN NUEVE AÑOS CON LA ELASTOGRAFÍA POR ULTRASONIDO (FIBROSCAN®)

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Introducción: la elastografía de transición basada en ultrasonido (Fibroscan®) es una técnica utilizada para la evaluación no invasiva de la fibrosis hepática. Es una herramienta útil para evaluar el pronóstico del paciente y predecir las respuestas al tratamiento.

Objetivos: Analizar la etiología, las características demográficas y los resultados en exploraciones realizadas en un Área de Salud de Extremadura durante los últimos nueve años.

Método: Estudio observacional y descriptivo de la utilización del Fibroscan® realizados entre enero de 2010 y diciembre de 2018.

Resultados: Durante este período de tiempo, se realizaron 3272 exploraciones en 2202 pacientes. La edad promedio fue de 52 años (10-87), con un 62,4% de varones. Se realizaron 363 pruebas por año, máximo de 508 en el año 2015. La mayoría de las exploraciones se solicitaron a pacientes del mismo Área de Salud (60,2%). Los servicios solicitantes fueron los de Aparato Digestivo (68,6%) Medicina Interna –Infecciosas (24,6%). Las principales etiologías fueron: infección por VHC (46%), infección por VHB (17%), coinfección VIH + VHC (11%), enfermedad del hígado graso no alcohólico (EHGNA) (8,7%) y estudio de hipertransaminasemia (3,2%). Usando los valores de fibrosis establecidos para el VHC, hay 74% de pacientes con F0-F1, 12% con F2, 9,7% con F3 y 14,5% con F4. La obesidad es la principal limitación para esta técnica (10%), por lo que la sonda XL se utilizó en el 49% de las exploraciones en el año 2018. Los procedimientos debidos al VHC se han desplomado del 50% en 2015 al 21% en 2018, mientras que las indicaciones por EHGNA representan actualmente el 30% de exámenes totales.

Conclusiones: la erradicación progresiva del VHC junto con el aumento de NAFLD ha cambiado drásticamente las indicaciones para esta técnica. La obesidad es la principal limitación de esta técnica, lo que lleva a un mayor uso de la sonda XL en los últimos dos años.
ARFI, FIBROSCAN® AND SEROLOGICAL TESTS, AS METHODS FOR DIAGNOSING SIGNIFICANT LIVER FIBROSIS

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INTRODUCTION: The measurement of liver fibrosis is fundamental in the study of patients with Chronic liver disease (CLD). The Transient Elastography (TE) or Fibroscan® is the most widely used technique for the ultrasound estimation of Liver Stiffness (LS). ARFI (Acoustic Radiation Force Impulse), is also a highly reliable technique, with similar diagnostic accuracy and applicability.

OBJECTIVE: To compare both Elastography methods and serological tests in the diagnosis of fibrosis.

MATERIALS And METHODS: We include patients in ambulatory follow up for different hepatic pathologies, in any evolutionary stage, 18 years old and older. The estimation of LS by ARFI and TE, was obtained by expert operator.

RESULTS: Total 180 patients, (13 TE and 5 ARFI Invalid results). 54.5% males. Mean Age 61 years old. BMI Average 27 (overweight). Chronic hepatitis C virus is the most common etiology (55%), followed by hepatitis B (8.3%), primary biliary cholangitis (7.2%), autoimmune hepatitis (5%) and others. The concordance between ARFI and Fibroscan was 67% in F1, 45% in F2, 44% in F3, 79% in F4 (Kappa index 0.64). If analyzed in 2 groups of patients: non-significant (≤F2) and significant fibrosis, the concordance is higher (84 and 87% respectively). The concordance between ARFI, FIB4 and APRI in F4 is < 50%.

DISCUSSION And CONCLUSIONS: The Detection of cirrhosis is the most important clinical objective, due to its prognostic value. In Our study, the degree of LS between ARFI and TE shows adequate concordance in significant fibrosis, however, is lower if we analyze different 4 fibrosis stages, being smaller in F2 and F3. The Concordance is even lower with serological tests, which continues to support the use of ultrasounds elastography methods, for the estimation of fibrosis in CLD, minimizing the risks of invasive diagnostic methods.
ROLE OF THE ULTRASOUND IN THE ASSESSMENT OF THE ABDOMINAL CUTANEOUS NERVE ATTRAPMENT SYNDROME

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Objectives: Abdominal cutaneous nerve entrapment syndrome (ACNES) is an infradiagnosed and undertreated pathology that is a frequent cause of abdominal pain. The objective of this study is to show the value of ultrasound in the diagnosis and treatment of this pathology.

Methodology: A two-year prospective study in which 24 patients with ACNES syndrome were diagnosed and treated with 2cc echocardiography of Mepivacaine 2%, assessing the response to this treatment.

Results: there were 8 men and 16 women, the average age was 48 years. During the ultrasound performed due to abdominal pain, a clinical diagnosis and ultrasonographic suspicion of ACNES was made, noting that 22 cases affected only one branch and the level most affected was T10 (8 cases). Ultrasonic infiltration was performed in 13 cases, with complete improvement of pain in 10 of them with a single infiltration, 2 patients had residual pain two weeks after infiltration and another of them required another infiltration with mepivacaine plus corticoids and later evaluation per unit. from pain.

Conclusions: Ultrasound is a useful technique in the diagnosis of suspected ACNES syndrome, based on clinical criteria and localizing the output of the abdominal cutaneous nerve at the point of pain. It is also useful to perform ultrasound guided infiltration, assuring the proper place of infiltration and allowing a lower dose of medication.
MEASUREMENT OF SPLEEN STIFFNESS BY ACOUSTIC RADIATION FORCE IMPULSE IMAGING FOR THE PREDICTION OF ESOPHAGEAL VARICES

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-Introduction: Esophageal varices (EV) resulting from portal hypertension are serious complications of cirrhosis. Several studies had been conducted in the past few years to evaluate the accuracy of Liver Transient Elastography (TE) for the prediction of EV in cirrhosis, and now with spleen TE. However, there is poor information about spleen stiffness (SS) with other ultrasound elastography methods, like ARFI (Acoustic Radiation Force Impulse).

-Objective: to determine the value of spleen stiffness (SS) with ARFI, as predictor of the presence EV in chronic liver disease (CLD).

-Material and methods: Preliminary study, Transverse. We enrolled patients with diagnosis of cirrhosis, controlled in our institutions, 18 years old and older. All of them have Spleen ARFI and recent gastroscopy.

-Results: Total of 68 Patients: 13 Women and 55 men, with a mean age 62 ± 13 years. 73.5% of the patients belonged to A Child-Pugh, B: 20,5 and C: 5.8%. Patients with EV presented a value of SS superior compared to those who did not present EV, the difference being statistically significant (3.07 ± 0.4 m/s vs 3,8 ± 0,5m/s, p = 0,032). The value of SS of patients with any endoscopic data from portal hypertension (EV, gastric varices or portal hypertension gastropathy) was higher than those who did not present it, but not significantly higher (3.07 ± 0.4 m/s vs 2,7 ± 0,5m/s, p=0,119).

-Conclusion: Not much information about the SS value and the usefulness to predict EV, but it can be a good non-invasive method for the diagnosis. Our data shows that median of SS values by ARFI, in cirrhotic with EV was significantly higher, so this elastography methods must be useful in follow-up programs, avoiding unnecessary invasive testing.
PERCUTANEOUS ALCOHOL INJECTION (PEI) THERAPY IN THE ELDERLY HAS SIMILAR, IF NOT BETTER, RESULTS IN COMPARISON TO YOUNGER PATIENTS IN HEPATOCELLULAR CARCINOMA (HCC).

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Introduction
HCC is the most frequent primary liver cancer and an important medical problem worldwide. Due to the progressive increase on the population’s age in the western world, there is higher proportion of elderly patients with HCC. This has brought controversy concerning medical interventions that is why we evaluated PEI treatment in the elderly at our institution.

Material and methods
Retrospective study of 42 HCC PEI treated patients (November 2009 - March 2018). Database of 24 variables classified in demographic, clinical, ablative treatment and survival. The analysis was stratified in age groups, <75 or ≥75 years, and results regarding sex, ASA, Child-Pugh, MELD and BCLC stage, main nodule size, ethanol dose, response and survival per year were compared. Ablation’s effectiveness was assessed using dynamic MRI/CT. Data processing and analysis was carried out using SPSS (SPSS Inc, Chicago, IL, USA).

Results
Baseline characteristics were studied in 42 patients, distributed in groups of age: ≥75 years (22 patients) and <75 years (20 patients). There were differences in sex (≥75 years, 15 women, 68.2% vs <75 years, 17 men, 85%) (p<0.001), but both groups were similar in MELD, Child-Pugh, BCLC stage, size of the main nodule and amount of ethanol injected. Furthermore, significant differences were identified regarding ASA classification (ASA III ≥75 years 100% vs ASA III <75 65%) (p<0.01). Better responses (complete or partial) were obtained in the elderly (18, 81.8%) compared to the younger group (10, 50%) (p=0.029). Treatment complications were not significantly different between groups (0/22, 0% vs 2/20, 10%). One-year survival was similar in ≥75, 19 (86.4%) vs <75, 18 (90%) patients.

Conclusions
PEI treatment of HCC in elderly patients has at least similar efficacy and security as in younger patients. Therefore, this therapy should not be restricted due to patient age.
INTRODUCTION
Ultrasound in the screening of hepatocellular carcinoma (HCC) is shown to improve survival. Recommended treatments for BCLC (Barcelona Clinic Liver Cancer) stage 0 HCC: ablation and surgical resection.

MATERIALS AND METHODS
We performed a retrospective cohort study in patients with BCLC stage 0 HCC (January 2004 - October 2018).

RESULTS
Of 332 patients with HCC, 33 (9.9%) met the inclusion criteria. Males 78.8%. Median age 67.6 years (45.5-80.6). The diagnostic suspicion was by screening program in 93.9%. The diagnosis was through image criteria in 66.7% and cytohistological criteria in 33.3%. All nodules minus 2 were visible on ultrasound (93.9%), of the 22 RM 1 of the lesions was not seen (95.5%), and of the 31 CT was not seen on 7 (77.4%). Initial treatment: 84.9% percutaneous ablation, most of them ultrasound-guided (ethanolization 48.6%, radiofrequency 33.3% and microwave 3%), 12.1% surgical resection and 3% refused treatment. Among the ablative therapies, 39.3% were bridging therapies to liver transplantation. 12.1% were transplanted.

5 patients had complications (15.1%): 3 after ethanol injection (2 cutaneous disseminations, 1 hemoperitoneum and cholecystitis) and 2 surgical ones (collection).

The median follow-Up: 49.6 months. Remission 46.8%, recurrence 40.7% and non-response 12.5%. Median overall survival of 72.5 ± 4.2 months, with 45.5% of deaths (8 due to extrahepatic cause, 2 due to complications of cirrhosis and 5 due to HCC). Cumulative survival: 100% at year, 82.2% at 3 years and 69.8% at 5 years.

CONCLUSIONS
The detection in patients with BCLC stage 0 HCC, was mainly in the screening program. Cytohistological diagnosis was necessary in a third of the cases. The main initial treatment was ablation, like bridging therapy or with curative intent. Complications were infrequent. Survival was prolonged, with mortality in more than a half of the patients due to extrahepatic causes.
THE FOLLOW-UP EVALUATIONS BY ULTRASOUND OF THE TESTICULAR ADRENAL RESTS TUMOR IN CONGENITAL ADRENAL HYPERPLASIA

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Objectives Testicular adrenal rests tumor (TART) is one of the less seen benign tumors in testis, mostly occurred in patients with congenital adrenal hyperplasia (CAH). As the first-line examination method, ultrasound provides crucial information for diagnosis and determination on further interventions. This study aims to summarize the sonographic features and trace their evolutions during steroid therapy.

Methods The clinical and sonographic features of 8 patients diagnosed with congenital adrenal hyperplasia with suspected testicular involvement were collected and analyzed. The sonographic pictures and reports were reviewed again by experienced radiologists. Follow-up data were also collected.

Results The age of enrolled patients were between 13 to 27 years old. 1 patient was diagnosed as Aspermia, while another patient was diagnosed as Azoospermia. 7 of 8 (87.5%) patients had bilateral testicular lesions with identical characteristics, while 1 patient had unilateral lesions. The lesions were between 8×7mm to 35×14mm in size; All lesions had clear boundaries, while the shape and echogenicity varied. 2 patients had follow-up examinations after steroid therapy, and the tumor size and vascularity were altered in corresponding to ACTH levels.

Conclusions Key sonographic characteristics of TART are: resembled lesions on both sides, clear boundaries, and changes in sonographic characteristics after steroid therapy. These features can help radiologists to make timely and accurate diagnosis.
THE POSSIBILITIES OF QUALITATIVE AND QUANTITATIVE ELASTOGRAPHY IN THE EVALUATION OF THE PARATHYROID GLANDS IN SECONDARY HYPERPARATHYROIDISM

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Objectives. The aim of the study was an assessment of effectiveness of the ultrasound elastography in evaluation of pathologic changes of the parathyroid glands (PTG) in patients with secondary hyperparathyroidism including differential diagnosis of the parathyroid hyperplasia types.

Material and Methods. We examined 76 patients with end-stage renal failure on dialysis. PTG enlargement was found in 45 patients (59.2 %). We performed a multiparametric ultrasound of 66 PTGs with pathologic changes using strain and shear wave elastography (Applio 500, Toshiba). Parathyroidectomy was performed in 9 patients. Morphology of 23 PTGs revealed diffuse hyperplasia in 9 glands (39.1%) and nodular hyperplasia in 14 glands (60.9 %).

Results. According to strain elastography, hyperplastic PTGs were found as elastic lesions in most cases (86.4 %). Distinctive correlation was detected between color pattern and type of hyperplasia (rₛ = 0.677; p < 0.001). Median Young’s modulus (E ave) in hyperplastic PTGs was 11.4 kPa (7.2–30.2 kPa). Comparison of PTG stiffness in diffuse and nodular variants of hyperplasia revealed statistically significant difference in strain ratio (p = 0.02), E ave (p = 0.009) and SWE-ratio (p = 0.012). Median Young’s modulus was 9.9 kPa (7.2–15.2 kPa) in diffuse PTG hyperplasia and 13.4 kPa (9.5–30.2 kPa) in nodular PTG hyperplasia. Detected moderate direct correlation of E ave with maximal linear size and PTG ultrasound imaging volume (rₛ = 0.384; p = 0.002 и rₛ = 0.326; p = 0.008 respectively), as well as with overall PTG vascularity intensity (rₛ = 0.327; p = 0.01). No significant correlation between PTG stiffening and parathyroid hormone level as well as calcium-phosphorus product was found.

Conclusions. Ultrasound elastography as part of multiparametric ultrasound is a valuable additional method improving quality of diagnosis of parathyroid gland hyperplasia in secondary hyperparathyroidism.
CONDUCTING DYNAMIC ULTRASOUND EXAMINATION TO VISUALIZE RULONIZATION IN THE BLADDER TO DIAGNOSE URINARY TRACT INFECTIONS

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Rulonization (derived from the Polish word *rulon*, meaning to bend around a tube) in the bladder refers to circulating particles (composed of white or red blood cells, and parts of epithelium), which can only be visualized by dynamic ultrasound examination, and appear when the patient rolls over from side to side. Characterized by iridescent bright spots that appear to float within the bladder, detection of rulonization by ultrasound images may prove to be an additional and effective tool for diagnosing and ultimately treating urinary tract infections even when symptoms are weak or not observed.

Key Words: urinary tract infection, rulonization, dynamic ultrasound examination

Tomasz Kardacz 55 years old is physician and the director of private clinic NZOZ im. L. Rydygiera in Olsztyn Poland. He has over 20 publications and has written two books.
EROSIVE CHANGES ASSESSED BY ULTRASOUND IN RHEUMATOID ARTHRITIS PATIENTS: BONE EROSION AND ASSOCIATED FACTORS

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Objectives: To describe erosive changes using ultrasonography and associated factors of reparative changes of bone destruction in rheumatoid arthritis (RA).

Methods: Forty-five patients with RA were included, fulfilment of the 2010 American College of Rheumatology/European League Against Rheumatism classification criteria for rheumatoid arthritis. The metacarpophalangeal, proximal interphalangeal, wrist joints of them were examined by high frequency ultrasound at 0, 1, 3, 6, and 12 months. The ultrasound assessment consisted of hypoechoic synovial hyperplasia (SH), synovial vascularization using PD and cortical abnormalities. SH, PD signal and cortical abnormalities of each joint were scored separately at each visit, using semiquantitative scales (0-3).

Results: Eighty-two percent of the patients were anti-CCP positive, 64% were positive for RF. There was a significant correlation between anti-CCP levels and CRP value (p < 0.05). 70.3% of anti-CCP positive patients presented erosions compared with a 25.0% of those with negative anti-CCP (p = 0.024). Twenty-one patients completed 12 months’ follow-up. Progressive bone damage were significantly higher in joints that were unresponsive to anti-tumor necrosis factor therapy or disease-modifying anti-rheumatic drugs at 3 months. The erosion scores were significantly correlated with SH and PD score at 12 months.

Conclusions: Anti-CCP positive are strongly associated with more erosions and higher activity. If patients were unresponsive to anti-tumor necrosis factor therapy or disease-modifying anti-rheumatic drugs at 3 months, bone damage maybe progressive and rheumatologists maybe need to be considered of adjusting therapy regimen. (This work was supported by National Natural Science Foundation of China (No. 81571684)}
COMPARISON OF SHEAR WAVE VELOCITIES ON ULTRASOUND ELASTOGRAPHY BY DIFFERENT ULTRASONIC MACHINES IN VITRO

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Objectives: To investigate consistency in shear wave velocities (SWVs) on ultrasound elastography using different machines.

Methods: The SWVs were measured using a fresh in vitro pig muscle and liver tissues, with three recently widely used ultrasound elastography machines (SuperSonic Aixplorer, SIEMENS ACUSON S3000 and Mindray from different vendors) and two transducers (Linear probe, 10 and 15Hz, only with SuperSonic Aixplorer, muscle) at depth of 2cm with Surface couplant thickness 2mm. The SWE readings were measured in shear wave velocity (m/s). Mean SWVs from more than 20 measurements and coefficient of variations (CVs) were compared between three machines, two transducers. The differences of measurements between the three SWE machines were analyzed by ANOVA or kruskal - Wallis test.

Results: Mean shear wave velocity with machine A, B and C was 3.24 ± 0.18m/s, 2.51 ± 0.16 m/s and 3.51 ± 0.27 with tissue of muscle, 1.92 ± 0.24m/s, 1.76 ± 0.15 m/s and 2.56 ± 0.45 with tissue of liver, respectively. The mean SWVs in the three machines were significantly different (p =0.000 <0.001) with muscle and liver tissues. The highest coefficient of variance(0.18 and 0.08 with muscle and liver) and shear wave velocity were associated with the machine C, and the relatively low coefficient of variance(0.09 and 0.06 with muscle and liver) and lowest shear wave velocity were associated with the machine B. Mean velocity with 10 Hz Linear probe was 2.85 m/s and 2.95 m/s with 15 Hz Linear probe. The mean SWVs between the two transducers were no significant difference (p =0.107 >0.05).

Conclusions: There is considerable difference in SWVs on ultrasound elastography obtained from machines from different vendors. The higher frequency might give higher SWE values. It indicates that caution is needed when comparing the results using different elastography machines obtained during patients' follow-up in clinical practice or in scientific studies.
DIAGNOSTIC IMPORTANCE OF ULTRASOUND IN MANAGING DUB IN YOUNG PATIENTS

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OBJECTIVE: The aim of this case report was to show the benefits of ultrasound exams in young patients with DUB.

METHODS: Endovaginal sonography was performed on a 22 year old patient with moderate anemia and heavy, prolonged periods. US exam was performed with a 7MHz EV transducer, on a Medison ultrasound machine. A follow-up was done after three months of COC use.

STUDY RESULTS: Endovaginal scan of young patient with DUB showed significant focal hyperechoic endometrial thickness, most likely representing an endometrial polyp. The size of endometrial polyp was 13mm. Three months later a follow-up scan was performed for the previously diagnosed condition and after COC use. Measurements of endometrial thickness were done on the 10th day of a regular 28 day menstrual cycle. Endovaginal sonography demonstrated decreased thickness of endometrium lining and size of endometrial polyp which was 5mm.

CONCLUSION: The most important advantage of ultrasound pelvic examination is that it is fast, safe and a non-invasive diagnostic tool in finding the cause of DUB in young patients. Ultrasound evaluation is useful in follow-up situations for patients on COC therapy for DUB.

Keywords: COC-Combined Oral Contraception, DUB-Dysfunctional uterine bleeding, EV- endovaginal
Scientific Track: Obstetrics and Gynecology
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ULTRASOUND EVALUATION OF SUPERFICIAL MASSES IN HEAD AND NECK

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Superficial small palpable masses of head and neck are very common in daily practice of hospital. High resolution ultrasound is very useful for the characterization of the masses and helpful for the differential diagnosis.

The purpose of this study is to demonstrate various cases of superficial located palpable masses, and to learn the characteristic ultrasound findings and diagnostic points of palpable head and neck masses with the review of literatures.

Materials were retrograde collected in the tertiary hospital for recent several years using the PACS sorting system, and final cases were chosen among the all pathologic proven cases.

Most cases were located in face and scalp area. Several cases were in axilla, neck, trunk. Categories of Cases are as follows;

- Lipoma, dermoid, epidermoid, complicated or rupture of epidermoid, osteoma cutis, Pilometricoma, Trichilemmal cyst, Proliferating trichilemmal cyst, Sola elastosis,
- Palpable hard mass such as osteoma, calcified granuloma, Fibrovascular tissue with calcification(calcinosis cutis), Calcified foreign body,
- Vascular mass such as Hemangioma, lymphatic malformation, Venous lake, neurofibroma, schwannoma,malignant mass such as melanoma, lymphoma, skin cancer,
- Inflammatory mass such as chronic inflammatory mass, acute suppurative and granulomatous inflammatory mass, fat necrosis, fibrofatty mass, lipogranulomatous inflammatory mass, chalazion, scleroderma,
- Cosmetic foreign body injection related mass : foreign body granuloma(filler), cyst, granuloma. multiple injection droplet, Inflammatory mass, abscess.
- Trauma related hematoma, Superficial lymph node, parotid mass,

Conclusively, superficial palpable masses are very common and the causes and pathologies are variable. Ultrasonography is very helpful for the evaluation of characteristic findings of superficial masses and for the differential diagnosis.
CHARACTERISTIC FINDINGS OF CERVICAL LYMPH NODES IN VARIOUS DISEASES

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Ultrasonography is useful in the evaluation of cervical lymph nodes. The purpose of this presentation is to document the common US features of cervical nodes according to the diseases. We retrospectively reviewed ultrasonography in various diseases of cervical nodes during the last several years, and finally collected illustrated cases among the all pathologic proven cases. Normal and reactive nodes tend to be hypoechoic and oval and to have an echogenic hilum with hilar vascularity with/without radially branching toward periphery of nodes. Reactive nodes may show variable findings with hypertrophic cortex and hilar vascularity but much increases. On spectral Doppler Ultrasonography, normal and reactive nodes usually show low vascular resistance. Tuberculous lymphadenitis shows hypoechogenicity with focal nodal necrotic or echogenic granulation foci with displaced hilar vascularity. Kikuchi disease shows increase nodal echogenicity with dirty perinodal fat planes, and markedly increased hilar vascularity. Malignant nodes include metastatic and lymphomatous nodes. Metastatic nodes are usually hypoechoic, round, without echogenic hilum, coagulation necrosis or intranodal cystic necrosis, eccentric cortical hypertrophy, extracapsular spread. Intranodal cystic necrosis is common in metastasis from head & neck squamous cell carcinoma. Intranodal reticulation is characteristic finding of lymphomatous node. On color and/or power Doppler Ultrasound, metastatic and lymphomatous nodes usually show peripheral or mixed vascularity. On spectral Doppler, malignant nodes tend to have high RI and PI values. Metastatic nodes from papillary carcinoma of thyroid may be hyperechogenicity with punctate calcifications. Conclusively, ultrasound appearances of cervical nodes differ from according the causes as compared with normal or reactive nodes. Ultrasound features differentiating pathologic nodes include round or ovoid shape, absent or present hilum, intranodal necrosis, reticulation, calcification, matting, soft-tissue edema on gray scale ultrasound, and hilar or peripheral or mixed vascularity on Color Doppler Ultrasound.
AN EXPERIMENTAL ULTRASOUND KIDNEY SCREENING ON THE DIABETES PATIENTS TO ANALYZE THE CLINICAL-ULTRASONOGRAPHIC CORRELATION AMONG MODIFIED GLOMERULAR FILTRATION RATE IN CHRONIC KIDNEY DISEASE AND RENAL STIFFNESS WITH STRAIN ELASTOGRAPHY BY THE FAMILY PHYSICIANS.

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Objectives: Diabetic Nephropathy (DN) is the leading cause of Chronic-Kidney-Disease (CKD) being characterized, initially by increases in kidney length and renal parenchyma-thickness, followed in late stages, when the DN deteriorates clinically, by persistent or slightly decreases in kidney sizes, and thus there would be not a specific sign of DN. Our aim was to analyze the correlations of both, renal tissue stiffness (Strain-Elastography) and US-morphometry, with clinical-biochemical indicators in patients with DN.

Materials and Methods: We did a Kidney-Ultrasound-Screening on 500 patients with diabetes type1 and 2. Patients were followed up with ultrasonography-screening performed and also laboratory assays twice a year. Renal-cortical-thickness, length(volume), stiffness and estimated-glomerular-filtration-rate(eGFR)values, were analyzed using the Pearson correlation and ROC-curve-analysis to assess the kidney function.

Results: Our US-screening, with an accuracy of 88%, found renal elasticity (Strain-Ratio-SR) worsened progressively from CKD-Stage 3 to 5 (p<0.001). The correlation, between elasticity and proteinuria, may be a possible association between kidney-stiffness and early renal fibrosis. The presence of proteinuria is characterized with infiltration of inflammatory cells into the renal-interstitium and replacement of the tubulointerstitium by fibrous scar. The renal stiffness, measured by strain-elastography, with renal ultrasonography, correlates well with proteinuria and rapid renal deterioration in patients with CKD. A statistically significant positive correlation was found between eGFR and both: Strain-Ratio (r=0.66, p<0.01) with cortical-thickness (r=0.85, p<0.01) and degree of kidney-dysfunction. We have done also a ROC curve analysis, to compare the ultrasound techniques used in our study, with increase sensitivity in early diagnosis of CKD in diabetics.

Conclusion: Our US-screening suggests that both, ultrasonographic-cortical-thickness-measurements besides the renal-stiffness(SR) measured by Strain-Elastography, can be some important imaging techniques for the follow-up of diabetic patients and could predict the rapid renal function deterioration(CKD) in future practice of the family physician.
ULTRASOUND (US) - GUIDED PERCUTANEOUS HIGH-POWERED MICROWAVES ABLATION (MWSA) OF MALIGNANT LIVER TUMORS: 8-YEAR ANALYSIS OF COMPLICATIONS IN TWO HIGH VOLUME ABLATION CENTRES.

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Objectives
High-powered MWSA, a relatively-new very promising tool for ablation of malignant hepatic tumors, is replacing radiofrequency because inducing larger ablation volumes, higher capability of coagulating blood vessels, faster ablation time and less severe heat sink effect. Therefore more and more patients are now treated worldwide with this new technique. This study reports our 8-year experience on complications.

Methods
630 pts (423 males; age range 56-83 years) with 911 hepatic malignant nodules (489 Hepatocellular Carcinoma [HCC], 387 liver metastases [MTS] and 35 Intrahepatic Cholangiocarcinoma [ICC]) (diameter range 1.3-8 cm) were treated from 2014 to 2018 in two Southern Italian centres. Under unconscious sedation, a percutaneous US-guided MWSA was performed with a single 2450 MHz antenna connected with a powerful generator working from 100 to 140 W. The applicator comprised a 1.8-mm diameter stainless steel shaft tipped with a ceramic trocar array, cooled with sterile saline and contained a thermocouple to monitor shaft temperature.

Results
889 sessions and 1453 antenna insertions were performed. No complication due to sedation was observed. One death occurred in a large HCC cirrhotic patient who presented rupture of the tumor 20 hours after ablation followed by haemoperitoneum, haemorragic shock and death. Haemoperitoneum was observed in five other patients (3 HCC and 2 MTS): 4 patients needed of arterial embolization while in one patient haemoperitoneum healed spontaneously without blood transfusion. Hepatic abscess was observed in 3 patients (1 MTS and 2 ICC) who needed of US-guided percutaneous drainge plus antibiotic treatment. 16 mild pleural effusion but no hemothorax or pneumothorax was observed.

Conclusions
Our results show that percutaneous US-guided MWSA of malignant liver tumors is safe with low mortality. Although in our centres mortality was too low (0.13%), much care must be made on major complications related procedure such as bleeding events and abscess formation.
Shear wave elastography (SWE) examination is a relatively new and highly effective method to reveal mechanical features of tissue by demonstrating quantitative elasticity value. The margin of the lesion, orientation, shape, border and echogenicity are considered in differentiation of breast lesions on USG. It is a known fact that malignant lesions are usually palpated as a hard mass in the physical examination. A qualitative broad information can obtain about the tissue elasticity by integrating SWE examination into the classical USG evaluation. Thus, SWE examination prevented a possible delay in diagnosis in our young, breastfeeding patient. We reported the finding of SWE examination in breastfeeding patient with breast malignancy in addition to magnetic resonance imaging(MRI) and ultrasonography(USG) findings.
PREOPERATIVE TWO-DIMENSIONAL SHEAR WAVE ELASTOGRAPHY TO PREDICT LIVER FIBROSIS AND OUTCOMES OF KASAI HEPATOPORTOENTEROSTOMY IN PATIENTS WITH BILIARY ATRESIA: A SINGLE CENTER STUDY

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Objectives To evaluate the value of preoperative two-dimensional (2D) shear wave elastography (SWE) for assessing liver fibrosis stages and predicting native liver survival (NLS) after hepatopportoenterostomy (KPE) surgery in patients with biliary atresia (BA).

Methods 125 patients who performed 2D SWE before KPE or liver biopsy were enrolled. Histologic liver fibrosis stage was graded using the METAVIR score. The 2D SWE, age, aspartate aminotransferase to platelet ratio index (APRI), and other serum markers were correlated with liver fibrosis. For 120 patients who had KPE surgery, the correlation of 2D SWE value, age, liver fibrosis stage and APRI with NLS were analysed. Receiver operating characteristic (ROC) curves, the area under the ROC (AUROC) curve analysis, Kaplan-Meier method, X-tile plots and Cox regression analysis were used.

Results The 2D SWE value had good diagnostic power for predicting the fibrosis stages (AUROC=0.80-0.93, all P <0.001), with cut-off values as 8.5kPa for F1, 12.3kPa for F2, 13.8kPa for F3, and 16.5 KPa for F4. APRI and other serum markers was less valuable in predicting liver fibrosis stages (all P <0.05). Cox mutivariate regression showed that the SWE (P <0.001) and APRI (P <0.001) were the two statistically important variables. However, the SWE (Wald = 17.815) had a greater weight than APRI (Wald = 13.767) in determining the NLS. Further, the C_index of 2D SWE[0.67(0.61,0.73)] in predicting NLS was greater than that of APRI[0.59(0.54,0.64)](P=0.021). Sixteen of 18 patients (88.9%) with a 2D SWE value >23.1kPa survived no more than one year with their native liver after KPE.

Conclusions The preoperative liver stiffness measurement taken by 2D SWE value is useful to predict the liver fibrosis stage and the outcome of KPE surgery in patients with BA.
A NEW MARKER IN DISCRIMINATING MALIGN BREAST LESION FROM BENIGNS

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Shear wave elastography (SWE) is a relatively new, promising modality which enables detailed information about tissues mechanical properties (1). Mammographic and sonographic evaluation is an effective method, however it can be challenging to diagnose character of lesion in dense breasts parenchyma. We presented a case of elasticity values of mass lesion and contribution of SWE in dense type breast. A 50 year-old female patient admitted to our hospital complaining from pain in the left breast. A heterogenous, hypoechoic mass lesion was sonographically detected on the left breast in a diameter with 13 cm (Figure 2). Because of the atypical appearance of lesion elastographic evaluation was performed. Many soft areas within lesion were noted on color elasticity mapping. Mean elasticity value was 2.48 m/s 17 kPa on consecutive measurement. Giant lesion histopathologically proved as a hamartoma.

In conclusion; SWE is analogous to clinical palpation with ultrasonography for a malignancy and may contribute in discriminating malign breast lesion from benigns.
TO BIOPSY OR NOT TO BIOPSY: STRAIN ELASTOGRAPHY FOR SOFT TISSUE TUMORS IN A TERTIARY SARCOMA CENTER

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Objective: This study aims to investigate the ability of ultrasound (US) strain elastography (SE) as an adjunct to predict malignancy in soft tissue tumors (STTs) suspect of sarcoma or metastasis in tertiary reference center for sarcoma.

Methods: 137 patients were included. Patients were referred on the basis of clinical or radiological suspicion of malignant STT. All patients had previously undergone diagnostic imaging (MRI, CT or PET-CT). After recording SE cine loops, US guided biopsy was performed. All elastograms were reviewed by three investigators, who were blinded to final diagnosis. For each elastogram, a qualitative, visual 5-point score was decided in consensus and a strain ratio (SR) was calculated. Final pathology obtained from tumor resection or biopsy served as the golden standard.

Results: 81 tumors were benign, and 56 were malignant. t-tests showed a significant difference in mean visual score between benign and malignant tumors (p = 0.043). The mean visual scores for benign and malignant tumors were 3.16 (95% CI [2.94; 3.38]) and 3.49 (95% CI [3.26; 3.72]), respectively. There was no significant difference in mean SR between the two groups.

Conclusions: The mean visual score of malignant tumors was significantly higher than that of benign tumors. SE may be a valuable adjunct to traditional B-mode US in primary diagnostics when considering whether to biopsy. We found no significant difference in SR between benign and malignant tumors.
US GUIDED HIGH CONCENTRATION DEXTROSE PERIMYSIUM DISSECTION FOR INFROSPINATOUS MYOFASCIAL PAIN

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Objectives
The purpose of the study is to evaluate the effectiveness of local high concentration dextrose solution to dissected perimysium for treating infraspinatus myofascial pain syndrome.

Methods
We prospectively collected total 100 patients complaint of posterior shoulder pain (male: female=28:72, age ranged 26-92 yrs, average of 58.11 yrs) from Apr. 2016 to Oct. 2018. All patients suffered from tenderness over infraspinatus muscle region under ultrasound guided compression. The degree of pain was measured by pain score (visual analog score) ranged from 2 to 9 with average of 7.03. Total 10cc of 15% dextrose solution which mixed with 2cc 2% lidocaine was injected by perimysium dissection under ultrasound-guided. All patients were evaluated with the severity of symptoms as documented by visual analogue scale (VAS), immediate response, and follow-up visit one month after treatment.

Results
There were 35 patients (35%) had pain-free, 49 patients (49%) had more than 50% improvement, 16 patients had mild improvement less than 50% after treatment. The mean reported VAS score was 7.03 pre-treatment and 1.81 after-treatment.

Conclusions
Ultrasound-guided 15% dextrose solution injection to dissected perimysium of infraspinatus muscle is effective in the management of posterior shoulder myofascial pain syndrome.
ROLE OF MODERN SONOGRAPHY IN THE ASSESSMENT OF KNEE PATHOLOGIES: REVIEW OF A LARGE SERIES OF PATIENTS

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**Objectives:** Bedside ultrasound (US) is being used more frequently to assess patients with acute knee injuries. Different previous studies showed inconsistent results regarding the sensitivity and specificity of US examination ranging from inaccurate exam to exam that matches the MRI results. The main purpose of this study is to determine the role of sonography in detecting knee pathologies, and if it can be used as the main single exam for diagnosing meniscal injuries.

**Materials and methods:** A retrospective review of US exam results done in Ziv Medical Center, for 358 patients/370 knees between the years 2013-2015. We evaluated the prevalence of different knee pathologies shown on US exam, the relationship between these pathologies and the sensitivity and specificity of US were calculated in relation to MRI, the Gold Standard non-invasive modality for detecting meniscal tears.

**Results**
Most patients (92.2%) had at least one pathology on US. The Sensitivity of the US scan to detect medial tear was 78.57%, and the Specificity was 70%, PPV was 78.57% and NPV was 70%. For a lateral tear, the Sensitivity was 50% and the Specificity was 94.4%, PPV was 75% and NPV was 85%. Different knee pathologies detected by US will be demonstrated.

**Conclusions:**
There is a high correlation between medial meniscal tear and osteoarthritic changes in the knee joint, likewise between lateral meniscal tear and lateral subluxation and parameniscal cyst. Therefore, US exam is a good first line modality in patients with knee complaints, and patients with positive results for meniscal tear, meniscal subluxation, degenerative medial changes or parameniscal cyst, should be directed toward MRI exam and further investigation and treatment. However, patients with negative US exam and high suspicion of internal knee derangements (meniscal tear, cruciate ligament tear) should be directed for MRI examination, due to NPV around 70-85%.
THE ROLE OF ULTRASOUND IN DIAGNOSIS OF CONGENITAL LUNG MALFORMATIONS.

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INTRODUCTION: Congenital lung malformations are diagnosed at the 20 weeks of GA, through ultrasound scan (US). They were treated surgically, and most outcomes are favorable. However, during prenatal US there are difficulties in differential diagnosis between congenital cystic adenomatosis malformation (CCAM) and bronchopulmonary sequestration (BPS). Aim: To evaluate the accuracy of postnatal US in the identification of CCAM and BPS in newborns in comparison with the radiological methods.

MATERIALS: We observed 90 newborns hospitalized in 2015–2017 at the Neonatal Surgery Department due to prenatally diagnosed malformations. 61 patients had CCAM, 39 had BPS. The instrumental examination included chest X-ray, US, magnetic resonance imaging (MRI) and computed tomography (CT). US was performed after a chest X-ray (linear sensor 7-14 MHz, B-mode, Doppler).

RESULTS: An X-ray examination confirmed congenital lung malformations in 61 (68%) out of 90 with this prenatal diagnosis. US changes were found in 80 (89%); among them CCAM was identified in 51 cases, 39 had BPS. The main criterion for the differential diagnosis between BPS and CCAM was the presence of high linear blood flow velocity and/or an abnormal vessel supplying the BPS. Identification of CCAM or BPS abnormality by US was confirmed by MRI CT in 100% cases, was verified on surgery and during the histological analysis.

CONCLUSIONS: Linear blood flow velocity and the resistance index are important diagnostic criteria for differential diagnosis between CCAM and BPS. X-ray examination cannot be considered as the only method for the diagnosis of CCAM and BPS. In order to reduce a radiation exposure, we create the diagnostic algorithm for newborns.
AN UNUSUAL CAUSE OF LOWER GASTROINTESTINAL BLEEDING: ILEAL ULCERS DUE TO GASTROINTESTINAL AMYLOIDOSIS

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We present a case of a 73 year old woman who comes to the emergency services after suffering from a fever and bloody diarrhea, who has a previous history of rheumatoid arthritis. Laboratory findings show anemia and an elevation of acute phase reactants. Due to suspicion of infectious diarrhea, stool cultures are extracted revealing negative results, and empirical antibiotic therapy is initiated. On account of the persistence of the gastrointestinal bleeding, a CT-angiography and an intestinal ultrasound are carried out, showing the presence of a large segment of terminal ileum, at least 20 cm, with bowel wall thickening, deep ulcers, loss the layer pattern and affection of the mesenteric fat, as well as marked Doppler activity 3/3. The afore mentioned results are confirmed through ileum-colonoscopy and samples for a histological research were extracted, which find an intensive amyloid A deposit. The patient is diagnosed with secondary amyloidosis resulting from underlying rheumatoid arthritis. The patient is found to be unresponsive to treatments. Gastrointestinal bleeding persists, which subsequently leads to her death.

Amyloidosis is a multisystemic chronic disease which consists of an extracellular deposit on several tissues. The deposit consists of a proteic, fibrillar, insoluble material which is resistant to proteolytic digestion. AA Amyloidosis (reactive) is related to the presence of an underlying chronic inflammation, and the clinical spectrum is variable. The massive and incoercible lower gastrointestinal bleeding, due to the presence of ileal ulcers secondary to the amyloid deposit and the lack of colon involvement is very unusual. The diagnosis requires histological confirmation, to prove the presence of amyloid deposit. The treatment must be focused on stopping the early evolution of the underlying inflammatory disease. To conclude, highlight the use of intestinal ultrasound, with high sensitivity and specificity in the assessment of intestinal pathology, with superimposed results and gastrointestinal bleeding due to amyloidosis may lead to devastating outcomes, and could even cause death.

FIGURES:
Poster presentations
POSSIBILITIES OF GASTROINTESTINAL ULTRASONOGRAPHY IN THE IDENTIFICATION OF PATHOLOGICAL PROCESSES OF THE CARDIOESOPHAGEAL ZONE.

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Backgrounds

Gastrointestinal ultrasonography has existed in the world medical practice more than 35 years ago. The first works on this subject in the world literature date back to 1978-79 years. In recent years, ultrasound diagnostics has been unfairly relegated to the background in connection with the development and introduction of cutting-edge medical diagnostic technologies such as computer, magnetic resonance and positron emission tomography. But in the last period, ultrasonography as a whole and gastrointestinal therapy in particular are gaining strength in many countries, although they meet with some resistance. Along with informative ultrasound techniques of the stomach and intestines, in recent years, ultrasonography of the distal esophagus and the cardioesophageal zone has become widespread.

Objectives

The purpose of this work is to determine the advantages, value and objectives of in identifying organic and functional changes in the distal esophagus and cardioesophageal zone

Advantages:
1. Non-invasiveness and absolute tolerability by all category of patients in comparison to endoscopic studies
2. Absence of radiation in comparison to X-ray and CT
3. Visualization and evaluation of all layers of the esophagus's wall in contrast to endoscopy
4. Budget method in comparison with CT and MRT

Value:
1. Availability of the general population
2. Ability to use as a screening method in identifying pathology of the cardioesophageal zone,

Aim:
1. Primary detection of pathological processes of the cardio-esophageal zone
2. Referral of patients, if necessary, to further examination
3. Patient orientation towards conservative treatment by gastroenterologists, or surgical treatment by surgeons

Methods
The patients examined were grouped according to the following pathological processes, revealed by ultrasonography:
1. Cardia insufficiency - with dilatation of the hiatus ring to 16-18 mm
2. Sliding unfixed hiatal hernia with a hiatal ring extending over 18 mm without changing its diameter during a Valsalva maneuver
3. Sliding fixed hiatal hernia with an extension of more than 18 mm without changing the diameter during the Valsalva maneuver
4 Distal reflux esophagitis, including erosive and ulcerative
5 Tumors of the distal esophagus and cardioesophageal zone

There are certain limitations visualization of the cardioesophageal zone:
1 Hypersthenic constitutional patient type
2 Excessive thickness of subcutaneous fat
3 Increased flatulence in the stomach
4 pain syndrome contact with sensor

However, in most cases, ultrasound diagnosis of the pathology of the cardio-esophageal zone is carried out smoothly and very successfully.

Conclusion
Gastrointestinal ultrasonography is a valuable informative non-invasive, non-radiating method for diagnosing functional and organic diseases of the distal esophagus and cardioesophageal zone, which deserves wide application in world medical diagnostic practice. This technique can be widely used in the screening of reflux disease, inflammatory and oncological pathology of the cardioesophageal zone.
DETECTION OF CLINICALLY SIGNIFICANT PROSTATE CANCER USING SUBHARMONIC IMAGING

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Objective: To evaluate prostate cancer (PCa) detection with contrast-enhanced subharmonic transrectal ultrasound imaging (SHI).

Materials & Methods: 55 men scheduled for a clinically indicated prostate biopsy were enrolled in this IRB-approved, pilot study. The initial 5 subjects were studied for SHI optimization and the remaining 50 subjects were evaluated with contrast-enhanced sonography using continuous SHI, color and power Doppler imaging as well as the conventional grayscale, continuous color and power Doppler and SHI combined with maximum intensity projection and flash replenishment. A maximum of 6 targeted biopsy cores were obtained from sites of greatest enhancement asymmetry, followed by clinical systematic cores in the sextant distribution. Pixel-by-pixel subharmonic time-intensity parameters, namely, time to peak, peak intensity and estimated perfusion were also calculated for prostate base, mid and apex. Imaging results were compared to pathology using ROC analyses.

Results: Cancer was detected in 22 of 50 subjects. Among subjects with clinically significant PCa (n = 11), targeted cores were more likely to be positive (odds ratio 1.39, p = 0.02). The majority of patients detected by SHI demonstrated significant PCa based on pathological evaluation (5/8) and SHI was an independent marker of malignancy (p = 0.027). ROC analysis of imaging findings compared to biopsy results yielded diagnostic accuracies ranging from 0.59 to 0.80 for all imaging modalities with the highest being for quantitative subharmonic perfusion estimates.

Conclusions: The PCA detection rate of SHI guided targeted cores is higher when compared with sextant cores with diagnostic accuracy of 0.80 for quantitative subharmonic perfusion. This first in humans study provided for a preliminary estimate of the diagnostic accuracy of SHI for detection of clinically significant PCAs, which can form the basis for a future large scale trial.
THE INFLUENCE OF LOW-FREQUENCY ULTRASOUND ON THE MINIMUM INHIBITORY CONCENTRATIONS OF ANTIBIOTICS AGAINST CELLS WITH PROKARYOTIC TYPE OF STRUCTURE

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Objectives. 30 strains of fecal Escherichia coli.

Methods. Inoculum of Escherichia coli (an optical density corresponding to the standard of MacFarland 0.5 turbidity) was treated for 15 minutes by use of ultrasonic surgical apparatus with a resonant frequency of 50 kHz. The minimum inhibitory concentrations (MIC) of antibiotics of chemical groups of penicillins, tetracyclines, cephalosporins, aminoglycosides against the initial and ultrasound-treated strains were determined by 2-fold antibiotic titration in Muller-Hinton broth with subsequent incubation at t+37°C for 24 hours.

Result. The initial strains of Escherichia spp. were divided into two groups, based on MIC antibiotics used in the experiments – resistant (MIC tetracycline - 64 µg/ml; MIC penicillin, kanamycin and cefazolin - 128 µg/ml) and intermediate strains (MIC range for different chemical groups of antibiotics - 6-8 µg/ml). The decrease of MIC kanamycin and cefazolin was found from 6 to 3 µg/ml and from 8 to 4 µg/ml, respectively for intermediate E. coli treated with low-frequency ultrasound. No decrease of antibiotic MIC against resistant strains after treatment with ultrasound. The mechanisms of formation of different levels of MIC antibiotics have not been completely studied. The differences in the biological effect of ultrasound on the minimum inhibitory concentrations of antibiotics are probably associated with the peculiarities of antibiotics diffusion into the cell or the mechanisms of resistance formation to antibiotics.

Conclusions. It is most likely that the effect of low-frequency ultrasound on bacteria with different levels of MIC antibiotics is not the same. Low-frequency ultrasound can contribute to a slight decrease in antibiotic MIC, but only for strains whose resistance is associated with a change in the permeability of the cytoplasmic membrane and is not associated with other mechanisms of resistance.
SUBDERMAL CEUS LYMPHOSONOGRAPHY IDENTIFICATION OF SENTINEL LYMPH NODES IN BREAST CANCER

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Objective: To evaluate the efficacy of subdermal contrast-enhanced ultrasound (CEUS) lymphosonography in the identification of sentinel lymph nodes (SLNs) in breast cancer patients.

Methods: To date 35 women scheduled for breast cancer surgery with SLN dissection were enrolled in this IRB-approved study. Patients underwent subdermal Sonazoid (GE Healthcare, Oslo, Norway) injections around the tumor area at the 12, 3, 6, and 9 o’clock positions (0.25 ml per position for a total of 1 ml). Next CEUS lymphosonography using Cadence Pulse Sequencing on an S3000 HELX scanner (Siemens Healthineers, Mountain View, CA) with a 9L4 linear probe was used to identify microbubbles within the lymphatic channels leading to SLNs. Subjects received blue dye and lymphoscintigraphy for guiding lymph node resection as part of their standard of care. After surgical resection of the SLNs, the ex vivo specimen were scanned using color Doppler to confirm the uptake of Sonazoid, then the SLNs were sent to pathology to determine the final diagnosis.

Results: One-hundred and seventeen SLNs were surgical excised from the 35 patients; amongst those SLNs, 65 were positive for blue dye, 106 were positive for the radioactive tracer and 94 were positive for Sonazoid. Compared with the reference standard (blue dye) lymphoscintigraphy had an accuracy of 74%, while lymphosonography achieved an accuracy of 82%. Of the 117 SLNs excised, 13 were determined to be malignant by pathology; amongst them 4 were positive for blue dye, 8 were positive for nuclear medicine and 13 were positive for Sonazoid, which translated into an accuracy of 31% for blue dye, 62% for lymphoscintigraphy and 100% for lymphosonography.

Conclusion: Lymphosonography showed a better accuracy than lymphoscintigraphy for identifying SLNs in breast cancer patients when compared with the reference standard. All the 13 SLNs that were positive for malignancy were identified by CEUS lymphosonography.
CHARACTERIZATION OF ADNEXAL MASSES USING CONTRAST-ENHANCED SUBHARMONIC IMAGING

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Objective: This pilot study evaluated whether contrast-enhanced subharmonic imaging (CEUS SHI) could be used to characterize adnexal masses prior to surgical intervention.

Methods: Ten women (with 12 lesions) scheduled for surgery of an ovarian mass underwent a CEUS SHI examination of their adnexal region using a modified Logiq E9 scanner (GE, Waukesha, WI) with an endocavitary probe. Two contrast injections were performed during the examination. Patients first received a 1.5 ml bolus injection of Definity (Lantheus Medical Imaging, N Billerica, MA) while digital clips were acquired up to 5 minutes after injection. After a 10 minute wait to ensure clearance, patients received an infusion of 1.5 ml of Definity diluted in 25.0 ml of saline over 5 minutes, where digital clips were acquired using pulse destruction/replenishment SHI imaging across the lesion. Time intensity curves were created off-line to quantitatively evaluate CEUS SHI parameters. These parameters were compared to pathological characterization of the lesion.

Results: Of the 12 masses, 8 were benign and 4 were malignant. Qualitative analysis of the CEUS SHI images by an experienced radiologist resulted in a diagnostic accuracy of 70%, compared to 56% without contrast, demonstrating the benefit of SHI. Quantitative analysis of CEUS SHI parameters produced diagnostic accuracy as high as 81%. Peak contrast intensity was significantly greater in malignant than benign masses (0.109 ± 0.088 vs. 0.046 ± 0.030, p = 0.046). Malignant masses also demonstrated significantly greater perfusion than benign masses (24.79 ± 25.34% vs. 7.62 ± 6.50%, p = 0.045).

Conclusion: Results indicate CEUS SHI for pre-surgical characterization of adnexal masses may improve the determination of malignancy, reducing cost and risk to patients while improving diagnostic accuracy; albeit based on a small sample size.
RELIABILITY OF THE ULTRASOUND IMAGE OVERLAPPING METHOD FOR MEASURING THE LENGTH OF THE ACHILLES TENDON AND THE GASTROCNEMIUS MUSCLE

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Objectives
The image overlapping method (IOM), which enables the summation of several images obtained of regular width, has been developed recently for evaluating the myotendinous structures that are longer than the probe width (Freire et al, 2017). However, the reliability of IOM has not yet been sufficiently confirmed. Therefore, this study investigates the intraclass correlation coefficient (ICC) of the proposed method by measuring the lengths of the achilles tendon (AT), muscle-tendon unit (MTU), and the gastrocnemius muscle (GM) using the IOM.

Methods
Nine adults, including six male and three female individuals, participated in this study. The ultrasound probe (Konica Minolta) was placed over the calcaneus tuber (CT) and moved up longitudinally to obtain the ultrasound b-mode images from the calcaneus to the proximal end of the gastrocnemius muscle (PE-GM) divided at the ankle neutral position. The images obtained were superimposed, and AT, MTU, and GM were defined as the distances between the CT and the muscle-tendon junction at the soleus muscle (MTJ-SOL), the MTJ-SOL and the muscle-tendon junction at the gastrocnemius muscle (MTJ-GM), and the MTJ-GM and the PE-GM, respectively. Each boundary point was identified by using the cvCompareHist function of MATLAB (MathWorks). The lengths of these parts were calculated using ImageJ (National Institution of Health). ICC₁,₂ was utilized to confirm the intra-rater and intraday reliability of the analysis. The ICC values that are <0.05, <0.75, <0.90, and >0.90 were defined to have poor, moderate, good, and excellent levels of analysis reliability, respectively (Koo and Li, 2016).

Results
In this study, ICC₁,₂ for AT (0.77) and GM (0.90) were evaluated to be high, while that for MTU (0.53) was evaluated to be moderate.

Conclusions
Further research is warranted to improve the accuracy of the IOM and the identification of MTJ-SOL and MTJ-GM related to MTU.
ULTRASOUND AS A DIAGNOSTIC TOOL IN TEMPORAL ARTERITIS

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This article is about the ultrasound effect in the Temporal Arteritis diagnosis. This method is fast, affordable, non-invasive, and shows us particular signs in different modes (B-mode, Colour Doppler and spectral), which allows us to obtain an early diagnosis and treatment of the pathology, substituting invasive methods, such as biopsies samples.

It is very important to determine (according to the approaches made by the American College of Rheumatology in 1990, responsiveness 94%, specificity 91%) the diagnostic suspicious to prescribe the ultrasound study.

A high-frequency transducer (which can reach 11 or 13 MHz), is needed for this technique. The patient should be in supine position, while axial and longitudinal cuts of the temporal artery trunk and its branches are carried out. Colour Doppler mode will allow us to quickly identify the artery to be studied. In this case we can find a characteristic sign called “ultrasound ring sign”, which shows a perivascular hypoecogenic ring, as a result of the inflammatory thickening of the artery wall, which can be divided into segments. That is why the ultrasound scanning is significant.

It is worth stressing the possibility to find sections with arterial occlusion, where we will not be able to see Colour Doppler flow, even using Angio Power.

Systolic speed alterations should also be monitored, temporal arteries have normally velocities that vary between 55 and 60 centimetres per second, increased in inflammatory lesions of the wall, as well as if we use the resistance index.

As it was mentioned previously, even though this diagnostic tool is not regularly used in our field of work, it is a fast and non-invasive methodology that allows us to find characteristic ultrasound signs and diagnose arteritis, avoiding the exposure to more complex or invasive tests.
Objectives
In this poster we have as main objectives: review the scrotal anatomy and the imaging technique by US, show cases of scrotal pain, enlarged scrotum and scrotal masses and its evaluation by US and also specific US features that help classify the lesions as benign of malign.

Methods
US is indispensable for the radiologic evaluation of the scrotal pathology and it is primarily accomplished by using a high-frequency (5-10 Mhz) liner transducer.

Results
The sensibility in the detection and classification of the mass as extratesticular or intratesticular is near 100%, and this is essential as extratesticular lesions are more common and usually benign. US it necessary too for determining the characteristics of the masses (solid vs. cystic). However when the results of the US study are ambiguous as it is difficult to evaluate the origin of the mass, magnetic resonance imaging should be performed. In other scrotal pathologies, such as Fournier gangrene, computed tomography is require to determine the exact location and cause.
Also US play a key role in the diagnosis of true emergencies, such as torsion, and therefore guide a proper management. Acute scrotal pain is common among children and adults who present to the emergency department. Clinical symptoms and physical examination are often not enough for define diagnosis so imaging acquire an important role. There are three main causes of acute scrotal pain: ischemia, infection, and trauma.
US is too the first imaging modality for scrotal trauma and the findings are essential in the clinical decision making. US manifestations include collections, testicular disruption and vascular injury.

Conclusions
Knowledge of US technique and normal and pathologic US features associated with color Doppler findings is crucial for accurate diagnosis and for guiding appropriate management.
ECHOCARDIOGRAPHIC CARDIAC PHENOTYPING FOR THE STUDY OF NOVEL HYPERTROPHY LIMITING DRUGS IN THE MURINE PRESSURE OVERLOAD SITUATION

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Background and objectives: Aortic valve stenosis (AoS) is among the pathologies that most frequently lead to heart failure. AoS exposes the left ventricle (LV) to a progressive pressure overload, which leads to a tissue remodelling with cardiomyocyte hypertrophy and fibrosis of the extracellular matrix. The in vivo iterative evaluation of this remodelling process is best achieved in mice with high-resolution ultrasonography. BMP-7 plays a protective role against fibrosis and hypertrophy in this scenario, which is allegedly mediated by ALK3 signalling. In addition, two synthetic ALK3 agonist peptides (THR-123 and THR-184) have been already validated to inhibit fibrotic processes. The main aim of this study is to evaluate the effect of ALK3 agonists to prevent, halt or reverse hypertrophy in mice LV under experimental pressure overload using echocardiographic monitoring.

Methods: We performed controlled transverse aortic constriction (TAC) with double loop-clip (DLC) technique in mice and monitored the animals for 4 weeks. THR-123 and THR-184 peptides were administered intraperitoneal daily during the complete follow-up. A control TAC group was treated with saline.

Results: Peptide treated mice displayed at echocardiography improved morpho-functional parameters compared to controls. There was a significant reduction of ΔIVS thickening (0.005±0.001 (THR-123), 0.008±0.001 (THR-184) vs 0.014±0.002 mm) and LV mass (3.965±0.071 (THR-123), 3.832±0.214 (THR-184) vs 4.869±0.392 mg). Also, there was a protection against the development of LV longitudinal systolic dysfunction (MAPSE) (0.596±0.021 (THR-123), 0.617±0.024 (THR-184) vs 0.506±0.030 mm) with concomitantly reduced LV filling pressures (E/e’) (38.623±3.555 (THR-123), 40.087±3.590 (THR-184) vs 77.871±17.891).

Conclusions: Treatment of LV pressure overloaded mice with THR-123 and THR-184 prevented LV geometrical remodelling and the associated longitudinal systolic and filling pressure functional deteriorations. High-resolution echocardiography features non-invasiveness together with spatial and temporal resolution characteristics that make this technique an invaluable tool for cardiac phenotyping in this kind of studies.
SONOGRAPHIC FEATURES OF RARE AND INTERSTING CASES ARISING IN AXILLA

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As the axilla contains various structures including lymph node, nerve, vessel, fat, and even accessory breast tissue, diverse entities of disease can be developed in the axilla. In this exhibit, we would like to introduce our experiences of rare and interesting cases arising in the axilla and briefly review their imaging findings focusing on sonographic features. Familiarities of these lesions would be helpful for radiologists and clinicians to properly manage them. Examples of cases include (1) Axillary accessory breast cancer (2) Occult breast cancer with axillary metastatic lymphadenopathy (3) Skipped contralateral axillary recurred lymphadenopathy (4) Axillary melanoma (5) Axillary metastasis from dermatofibrosarcoma protuberans (6) Axillary fibrous histiocytoma (7) Axillary chronic hematoma mimicking recurrent tumor (8) Axillary accessory breast in male
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NEUTRAL CONTRAST ENHANCED FUSION SONOGRAPHY IS USEFUL FOR CHARACTERISATION OF UNSPECIFIC ABDOMINAL LESIONS IN COMPUTED TOMOGRAPHY

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Objectives
Fusion sonography (real-time sonography combined with reference CT or MR) is available since 2004. There is a discrepancy between studies and clinical use. The frequency of non-specific lesions found incidentally in computed tomography raises since several years. In the manuscript we tested the ability of fusion sonography to proof that the reference lesion has been correctly identified.

Methods
In more than 50 patients submitted with non-specific abdominal lesions in CT or MR neutral contrast enhanced fusion sonography was performed. Simultaneous display of the reference lesion was considered successful using neutral reference points (without the reference lesion as reference point). We analysed the success rate, the used reference points and planes, the results of the characterisation, and the frequency in which neutral contrast enhanced fusion sonography could diagnose a definitive result.

Results
Neutral contrast enhanced fusion sonography frequently fails to simultaneously display reference and live image. Parameter influencing success are size of the lesion, BMI of the patients, postoperative status, and others. We present neutral fusion points and planes, and discuss results of aetiologies which remained non-specific in computed tomography.

Conclusions
Neutral contrast enhanced fusion sonography is an option for improving characterisation of non-specific focal abdominal findings in computed tomography. Success depends on size of the lesion and several other factors. There are systematic reasons for this.

Poster presentations
COMPUTER AIDED DIAGNOSIS OF LYMPHOMA BASED ON DUAL-MODE ULTRASOUND RADIOMICS

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Objective To evaluate the diagnostic performance of dual-mode ultrasound radiomics in differential diagnosis of lymphoma based on computer aided elastography and B-mode images.

Method The B-mode ultrasound and elastography images from 543 lymph nodes (142 benign, 258 lymphoma and 143 metastatic) in 538 patients were analyzed retrospectively. Radiomic features were extracted from dual-mode images by computer. These features were selected by selection methods based on information theory. Different lymphadenopathy subsets were classified by the support vector machine. Then different modalities and different radiomic feature subsets were amalgamated Adaboost algorithm, and resulted in the improvement of lymph node classification.

Results Radiomics features was selected to classify different lymphadenopathy subsets, including four B-mode ultrasound (minor axis; long/minor axis rate; homogeneity; solidity) and three elastography features(hard area ratio; strain rate; coefficient of variation, Cov). The classification of lymphoma subset from other subsets were performed statistically significant by both homogeneity(P<0.05) and Cov(P<0.05). Other five features could also classify lymphoma subset from other subsets statistically significant(P<0.05), except strain rate in discrimination of lymphoma subset from benign subset(P>0.05). Moreover, the area under the receiver operating characteristic curve of multi-class classification counted by Adaboost algorithm were 0.875 in the discrimination of lymphoma subset from benign subset and 0.843 in the discrimination of lymphoma subset from metastatic subset, respectively.

Conclusion Radiomics features derived from dual-mode ultrasound images were valuable for diagnosis of lymphoma. Especially, the homogeneity in B-mode ultrasound and the Cov in elastography which doctors could not identify by unaided eyes were clearly analyzed by computer.
CONTRAST-ENHANCED ULTRASOUND IMAGING OF INFANTILE HEPATIC HEMANGIOMA

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Objectives The purpose of this study was to investigate the features of infantile hepatic hemangioma (IHH) on contrast-enhanced ultrasound (CEUS) imaging by compared it with hepatoblastoma (HB).

Methods Eleven infants (age range: 4 day~10 month) with IHH and 10 children (age <3 year) with HB were included, all of whom were performed CEUS before any invasive diagnostic procedure. Consent for CEUS examinations was acquired from parents. SonoVue (Bracco, Italy) was used as contrast agent. The dose for intravenous administration was 0.03 ml/kg, the same as FDA recommended. Patients were not asked for sedation specifically for CEUS. All HBs were confirmed by histopathology. Six IHHs were confirmed by histopathology. The rest 5 IHHs were confirmed by follow up. Any Contrast reactions in 24 h after CEUS were recorded.

Results All patients were not observed any contrast agent related reactions in 24h after CEUS. All IHHs showed peripheral nodular hypoenhancement, and progressive centripetal enhancement (11/11, 100%). Further, the enhancement of IHHs was earlier than that of peripheral parenchyma of liver. On the other hand, non of HBs showed progressive centripetal enhancement. In addition, 8 of 10 patients (80%) with HB showed hypoenhancement (washout) in portal phase. However, only 2 infants with multi-hemangioma (2/11, 18.2%) were showed hypoenhancement in portal phase. One of infants with multi-hemangioma were observed the shrink of lesions after follow-up for one year.

Conclusions Progressive centripetal enhancement on CEUS might be a specific feature for identifying IHH. CEUS should be recommended as the first-line confirm tool to evaluate infants who are suspected to have IHH because it is an cost-effective and non-invasive tool and no need for sedation.
IMPROVED DETECTION OF THE VASCULARITY ASSOCIATED WITH INDETERMINATE RENAL MASSES USING SUPERB MICRO-VASCULAR IMAGING

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Objective: To determine the ability of color and monochrome superb micro-vascular imaging (cSMI and mSMI), color Doppler imaging (CDI), and power Doppler imaging (PDI) to detect micro-vasculartiy in patients presenting with indeterminate renal masses compared to contrast enhanced ultrasound imaging (CEUS) as the reference standard.

Methods: To date, 25 patients with a total of 29 renal masses undergoing a clinically indicated CEUS examination for an indeterminate renal mass signed informed consent to participate in this ongoing IRB-approved study. On the day of CEUS cSMI, mSMI, CDI, and PDI were performed using an Aplio i800 with an i8CX1 transducer (Canon Medical Systems, Tustin, CA, USA). Still images of lesion vascularity was acquired. Following image randomization, a sonographer blinded to the CEUS results evaluated the presence or absence of vascularity within the renal mass for each imaging mode as well as their diagnostic confidence level on a 1-5 scale (5=most confident). Findings were compared to the clinical CEUS as the reference standard.

Results: Interpretation by the blinded observer showed improved vascular detection using cSMI compared to traditional Doppler modes. The cSMI sensitivity was 75.0% compared to CDI (56.3%), PDI (56.3%) and mSMI (31.3%). The specificity of cSMI (46.2%) was lower than those of CDI (53.8%), PDI (53.8%), and mSMI (84.6%). Importantly, the negative predictive value of cSMI (60.0%) was higher than CDI, PDI, and mSMI (50%). The overall accuracy of cSMI was 62.1% compared to CDI (55.2%), PDI (55.2%) and mSMI (55.2%). However, only the vascularity assessments of mSMI were statistically significantly different from the reference standard (p=0.013) in this pilot study.

Conclusion: Early results suggest that cSMI can detect more micro-vasculartiy than CDI, PDI, and mSMI in indeterminate renal masses. However, CEUS is still superior for definitive diagnosis of renal mass vascularity; albeit requiring injection of microbubbles.
CONTRAST-ENHANCED ULTRASOUND OF HCC FOLLOWING CHEMOEMBOLIZATION SUPPORTS RETREATMENT BY IDENTIFYING RESIDUAL TUMOR BLOOD SUPPLY

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Objective: Transarterial chemoembolization (TACE) of hepatocellular carcinoma (HCC) often requires iterative treatments to completely embolize the tumor feeding vessels. The objective of this study was to determine if a sonographer performing contrast-enhanced ultrasound (CEUS) can help plan TACE retreatment by identifying residual intra or extra hepatic vasculature supplying the tumor.

Methods: To date 53 patients have undergone CEUS follow up of HCC TACE therapy as part of an ongoing IRB approved clinical trial. CEUS was performed the morning prior to TACE and approximately 2-5 weeks post TACE using a Logiq E9 with a C1-6 transducer (GE Healthcare) operating in coded harmonic imaging mode. A sonographer blinded to the 1 month follow-up MRI and retreatment angiography reviewed the CEUS examinations of patients that were retreated to determine the active feeding vessels. As a reference standard, an interventional radiologist identified the active tumor feeding vessel using the angiogram obtained during retreatment.

Results: Eleven patients had residual tumors retreated by embolization. In these patients, the sonographer correctly identified 91% of the feeding vessels later confirmed by angiography. Importantly, the discordant case consisted of unconventional vascularity with flow from the medial left hepatic artery feeding a segment 8 tumor partially obscured by lung. In this case, CEUS demonstrated a partially treated tumor with minimal internal flow, but was unable to identify any major hepatic vascularity adjacent to the tumor.

Conclusion: CEUS may aid in TACE retreatment by not only identifying residual active tumor vasculature, but also identifying the residual feeding vessels requiring further embolization.
THE APPLICATION OF GEL PAD FOR THE EXAMINATION OF AXILLA WITH AUTOMATED BREAST SONOGRAPHY

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Objectives
Automated Breast Ultrasonography (ABUS) is mechanically designed to only examine the breast, so there exists a technical limitation on examining the axilla. For this reason, further examination with Hand Held Ultrasonography (HHUS) is currently required to supplement the limitation of ABUS. This study aims to demonstrate technical aspects of making and applying gel pads for the assessment of axilla with ABUS, and to evaluate the usefulness of the gel pad application.

Methods
For the experiment 1, four gel pads that could be applied to its shape for each individual patients’ axilla were produced by infusing each one of four materials (water, water & 1% super absorbent polymer mixture, ultrasonic gel, ABUS lotion) on every sterilized probe covers. ABUS phantom test was carried out in each gel pads, and the acquired images were qualitatively evaluated to select the best source material. For the experiment 2, 20 patients who visited our institution for breast sonography underwent the axilla examination using HHUS and ABUS with the selected gel pad. The acquired images were qualitatively evaluated for the clarity of anatomical structures and the presence of the artifact to ABUS based on HHUS.

Results
As a result of experiment 1, gel pads made of each four materials showed total score of 24, 34, 43, and 40, respectively. The gel pad made of ultrasonic gel was found to be the best material among all. Experiment 2 resulted that the image quality of ABUS showed 80% “Equal” and 20% “Insufficient” in the definition of the anatomical structures compared to HHUS, whereas artifacts presented in all cases.

Conclusions
The application of gel pad during the examination of axilla with ABUS was highly effective. This application can overcome the technical limitation and expand the role of ABUS as a reliable diagnostic tool.
GASTROINTESTINAL GRAFT-VERSUS-HOST DISEASE: USEFULNESS AND CHARACTERISTICS OF INTESTINAL ULTRASOUND

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We present a case of a 67-year-old man, with a history of chronic myeloproliferative disorder (myelofibrosis type) treated with hematopoietic stem cell transplantation (HSCT), who comes to the emergency services after suffering from fever, abdominal pain and diarrhea. An intestinal ultrasound was performed, observing a diffuse and extensive wall thickening of all digestive tract (more than 8 mm of thickness in the ileum), involving mucosa and submucosa layer (Fig 1A-1B) with an increased Doppler signaling (Fig 2A), and dilatation of intestine filled with fluid, as well as abundant free peritoneal liquid (Fig 2B). Study is completed by colonoscopy showing a continuous affection of the mucosa, with loss of vascular pattern, edema and friability (Fig 3). Samples for a histological research were extracted, which confirm the diagnosis of gastrointestinal graft-versus-host disease (GI-GVHD).

The patient was treated with methylprednisolone, tacrolimus, octreotide, and infliximab, without adequate response and subsequent death of the patient.

GI-GVHD is a major and life-threatening complication of HSCT. Diagnosis of GI-GVHD is based on the spectrum of clinical symptoms, endoscopic examination and histological findings, but sometime is difficult to perform an endoscopy in the presence of severe gastrointestinal symptoms. In contrast, ultrasound, enable evaluation of GI tract non-invasively. Typical US findings of patients with GI-GVHD include luminal dilatation, thickening of the GI tract wall, air–fluid levels suggestive of paralytic ileus, and inflammatory thickening of fat tissue surrounding the involved GI tract. Diffuse wall thickness of the GI tract involving multiple segments was the most common finding in the patients with GI-GVHD and this finding help us to distinguish GI-GVHD from other causes of enteritis. Severity and clinical improvement of GI-GVHD was correlated with ultrasound findings. Thus, ultrasound is an effective and non-invasive method of identifying the extent and severity of GI-GVHD.

Figures:

Figure 1A-1B

Figure 2A-2B
Figure 3:
CALCIFIED INTRAVASCULAR CATHETER "CAST" AFTER CENTRAL VENOUS CATHETER REMOVAL: A CASE REPORT

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Objectives. Fibrin sheaths develops around long-term indwelling central venous catheters (CVCs) as a natural response of the human body to artificially implanted device. In rare cases they may calcified and remain in place after the catheters are removed mimicking retained catheter fragment.

Methods. A 4-year-old male was examined by vascular ultrasound (US) and chest computer tomography (CT) during and after completion of a course of chemotherapy due to acute T-cell lymphoblastic leukemia.

Results. During a course of treatment US revealed in a patient echogenic sheath around CVC in the right jugular and brachiocephalic veins. CVC was functioning, patient was afebrile, with no signs of tenderness or erythema at the catheter site. Four months later after successfully completed course of chemotherapy CVC was removed. The operative note stated that the removed catheter was intact and measured to the same length as the time insertion. US showed hyperechogenic sheath with a hole in the center and with acoustic shadow in the right jugular vein immediately after catheter removal. Five months later a chest CT scan showed linear, tubular radiopaque density in the right jugular and brachiocephalic vein. The fibrin sheath was identified on repeated US examinations over 16 months and its shape and length remained unchanged, which confirmed that this was not a piece of catheter but rather a “cast” formed around it and adherent to the vessel wall. Additional procedures to retrieve a nonexistent catheter fragment were thus avoided.

Conclusions. A calcified catheter “cast” or calcified fibrin sheath is a possible consequence of central venous catheterization that may be mistaken for the presence of a retained catheter fragment. Therefore, a catheter "cast" should be considered as part of the differential diagnosis when intravascular calcification is found on an imaging study after removal of an implantable venous access device to prevent unwarranted surgical procedures.
OHVIRA SYNDROME: 3D ULTRASOUND DIAGNOSIS

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OHVIRA syndrome, previously known as Herlyn-Werner-Wunderlich (HWW) is a congenital anomaly of the urogenital tract, infrequent and low prevalence. We present the case of a 32-year-old patient with a history of hyperparathyroidism, being studied for fertility problems. Transvaginal ultrasound and hysterosalpingography study were performed, where a complete uterus bicornis with a double cervical canal was observed, with a diagnostic impression of blind homolateral vagina. Considering the uterine malformations and their association with urological malformations, an abdominal ultrasound was performed that showed a right renal agenesis, confirming the diagnosis of HWW.

OHVIRA syndrome is described by the triad of uterus didelphys, obstructed hemivagina and ipsilateral renal agenesis, which is produced by a failure in the fusion of the vertical and lateral Müllerian ducts. The overall prevalence of congenital anomalies of the Müllerian tract is around 2% to 3% among women. The pathogenesis of OHVIRA syndrome is unclear but is thought to be multifactorial. The usual presentation of such cases is nonspecific symptoms of repeated abdominal pain or dysmenorrhea, from progressive distention of the obstructed hemivagina (hematocolpos) after the age of menarche. The diagnosis usually comes in the adolescence, a few years after the menarche, rarely at the birth or during pregnancy, and only 10% beyond 30 years as our patient. The pregnancy rate in these patients is 87%, with a high percentage of abortions and premature childbirth.

High suspect and early diagnosis is necessary to avoid potential complications by providing surgical treatment. Delay in diagnosis and treatment can produce serious complications in patient's life such as endometriosis, adhesions and fertility problems. Primary treatment is surgical, resecting the septum and vaginoplasty to relieve the obstruction. Traditionally, the diagnosis is made with magnetic resonance, however, it can also be performed by transvaginal 3D ultrasound, like our case.

Figures:
Figure 1. Hysterosalpingography. The hemiuterus and permeable right tube are observed in the context of a didelphism uterus and left hemiuterus not visualized due to the presence of vaginal septum.

Figure 2.1 and Figure 2.2 Transvaginal ultrasound shows two complete uterine bodies with normal appearance, well-developed symmetric cavities with a double cervical canal. Full right hemiuter and full left hemiuter

Figure 3.1 and 3.2. Abdominal ultrasound of the left hypochondrium. Spleen (star) and left kidney absence, the white arrow indicates the theoretical location of the left kidney. It was observed in the left renal fossa occupation by intestinal loops (Fig 2.1) and an anechoic image was detected that could be in relation with pyelocalic groups (Fig 2.2).
CLINICAL ULTRASOUND FOR HEMATURIA IN EMERGENCIES.

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Objectives: we present the case of a 69-years-old-man, smoker of 20 cigarettes a day, who went to the emergency room with insidious and intermittent pain in left renal fossa, of several days of evolution; with episodes of intermittent hematuria.

Methods: a patient with left flank pain and hematuria, with a final diagnosis of renal cell carcinoma.

Results: the patient was admitted by left flank pain and haematuria. He has presented several similar episodes in recent months with analytical and anodyne radiographs, except hematuria in the urine sediment, always classified as nephritic colic. We performed a clinical ultrasound(CUs) observing a solid mass, heterogeneous, in lower pole of the left kidney, 6.11x5.36 cms, with increased vascularization.

Conclusions: The current specialized literature tells us that 90-95% of renal masses> 4 cm are malignant. Renal cell carcinoma(RCC) is responsible for 80-85% of all primary renal neoplasms. Risk factors for RCC include smoking, hypertension and obesity, as well as occupational exposure to certain toxins. The survival of patients with RCC has doubled in the last 50 years, from 34% of survival in 1954 to 73% in 2011, largely due to the early detection of these tumors, which are increasingly detected in smaller sizes, in turn, to the improvement of the treatments that these patients receive. Those patients diagnosed incidentally have a better survival rate(74%), compared to those who are diagnosed after being symptomatic(44%), so it is especially important in the prognosis the early diagnosis.

CUs allows to associate clinical and ultrasound information in the same hands, those of the emergency physician(EP), with the increase in diagnostic efficiency that is derived from it. In recent years the use of CUs by EP is increasing, which allows us a rapid, versatile, and comprehensive diagnosis together with clinical, exploration and analytical data, facilitating early treatment, of time-dependent pathologies.
USEFULNESS OF CLINICAL ULTRASOUND IN THE EMERGENCY ROOM IN A SEPTIC PATIENT

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Objectives: we present a case of septic condition with pyonephrosis diagnosed through the use of US scanning by emergency physician. Pyonephrosis is an uncommon disease that is associated with suppurative destruction of the renal parenchyma in adults. Obstruction and upper urinary tract infection play a role in its etiology. Fever, shivering, and flank pain are frequent clinical symptoms. If the pus detected as a result of the investigations is not surgically drained, antibiotics may not be effective. Septic shock and death can occur if the disorder is not treated with urgent surgery. In this context percutaneous or open nephrostomy, or retrograde ureteral catheter insertion is appropriate, so it is a very serious disease and EP have a very important role in early diagnosis to start antibiotic treatment and early referral to urologist.

Methods: a patient with fever, right flank pain and septic condition, with a final diagnosis of a calculous pyonephrosis.

Results: 54 year old male, was admitted to the ER by right flank pain and fever. He was malaise, hypotensive, febrile, tachycardic... in septic shock condition. Bedside emergency abdominal US performed by EP, demonstrated right severe pelvicaliectasis with a distal right ureteral stone. The patient was started on empirical antibiotics and a retrograde ureteral internal stents was placed by urologist.

Conclusions: Identifying pyonephrosis is clinically important in the Emergency Department because is a life-threatening condition. Emergent bedside ultrasound can do that EP may dramatically increase their ability to identify those patients that need further investigation, consultation and ultimately increase patient safety in emergency department. In the case presented thanks to the implementation of emergency US by the EP came to a prompt diagnosis of the cause of septic shock, with a quickly drainage of the infection site, which it allowed rapid patient recovery.
CLINICAL MUSCULOSKELETAL ULTRASOUND ALSO HAS ITS UTILITY IN EMERGENCIES.

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Objectives: extensor tendons run along the dorsal aspect of the wrist. They pass through a series of adjacent osteofibrous tunnels delimited by depressions on the surface of the radius and the ulna, and by the extensor retinaculum. Tendinopathy due to "overuse" is a clinical syndrome characterized by chronic pain and thickening of the tendon, results from a very continuous use of it, whether for work or sports reasons; and that in its initial phases it can associate an accumulation of liquid around it. In the case presented the anatomical and ultrasonographic knowledge of the emergency physician, as well as their training, they allowed to associate in the same hands all the clinical and ultrasound information, resulting in an immediate diagnosis of the process that affected the patient, being able to provide a treatment and early relief, without having to resort to other more expensive diagnostic tests that would take much longer to perform.

Methods: a case of tenosynovitis of the extensors diagnosed and treated at bedside thanks to the clinical ultrasound in the emergency room.

Results: 36-year-old-woman, with no personal history of interest, hairdresser, who came to the emergency room due to severe pain on the back of the right wrist. The emergency doctor performs an ultrasound that showed on the dorsal side of the wrist, at the level of the extensor tendons of the fingers, a large accumulation of fluid. We performed an infiltration of triamcinolone+lidocaine, improving the patient.

Conclusions: In the case that we present the anatomical and ultrasonographic knowledge of the emergency physician, as well as their training, resulted in an immediate diagnosis of the process that affected the patient, being able to provide a treatment and early relief, without having to resort to other more expensive diagnostic tests that would take much longer to perform.
PITFALLS IN THE DIAGNOSIS OF A PARATHYROID ADENOMA – CASE REPORT

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Parathyroid adenomas are situated nearby thyroid gland or even intrathyroidal and, in some conditions, could be mistaken for thyroid nodules. Ultrasound elastography is a noninvasive technique that can explore the elasticity and stiffness of different thyroid lesions. The aim of this presentation is to assess the value of 2D-shear wave elastography (2D-SWE) in the differentiation of a parathyroid adenoma from a thyroid nodule.

Case-presentation: We report a case of a 51-year-old female patient who was referred to our clinic for evaluation of a thyroid nodule. She reported that this nodule was found incidentally and she was treated with thyroxin for 3 years. The nodule is 16mm in the largest diameter and the patient is clinically euthyroid. 2D-SWE performed with an Aixplorer system (Supersonic Image Inc. France), using a linear high-resolution transducer 15-4 MHz, indicated a homogeneous aspect, with very low stiffness. The parameters measured by this technique were suggestive for a soft structure: the SWE-mean elastography index (EI) for the lesions was 11.0 kPa.

In our previous study on cases with hyperparathyroidism, the mean EI for parathyroid lesions was 10.2±4.9 kPa (6.6-15.9), while in benign thyroid nodules this parameter was 21.79±14.45 kPa and in malignant thyroid lesions - 38.91±23.03 kPa.

In this case, the value of EI was suggestive for a parathyroid lesion. The laboratory determinations performed later indicated increased PTH level and, for calcium, an upper-limit value. The parathyroid scintiscan was positive for a parathyroid adenoma. The patient was operated and pathology confirmed the diagnosis.

Conclusion: This new technique can quantitatively evaluate the stiffness of parathyroid adenomas, which is, in many cases, significantly lower when compared to that of thyroid nodules. These data indicate that the measurement of EI by 2D-SWE might be a new method that can help in differentiating of thyroid nodules from parathyroid adenomas.
ASSESSMENT OF LEFT VENTRICULAR SYSTOLIC FUNCTION AND SYNCHRONICITY IN PATIENTS AFTER CORONARY ARTERY BYPASS USING LAYER-SPECIFIC STRAIN TECHNOLOGY

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Objectives: To explore the application values of layer-specific strain technology in the assessment of left ventricular (LV) systolic function and synchronicity before and after coronary artery bypass graft (CABG) in patients with coronary artery disease (CAD).

Methods: Thirty-three CAD patients scheduled for CABG were recruited, along with 35 controls without cardiovascular disease. The images of apical four, two and three chamber views of LV were collected before CABG and 1 week, 1 month and 3 months after CABG. The layer-specific longitudinal peak strains, time to peak and peak strain dispersion (PSD) were determined for 17 segments of LV using Echo PAC workstation software and Q-analysis software. The differences of these parameters were compared between groups.

Results: The absolute values of layer-specific longitudinal peak strains at subendocardium, middle layer and subepicardium, respectively represented by GLPSendo, GLPSmid and GLPSepi, decreased significantly (P<0.05). Compared with the control group, the absolute values of GLPSendo, GLPSmid and GLPSepi reduced significantly over time (i.e., from before CABG to 1 week, 1 month and 3 months after CABG), while PSD increased significantly (P<0.05). Compared with the preoperative values, the absolute values of GLPSendo, GLPSmid and GLPSepi decreased significantly 1 week after CABG (P<0.05), and so did those of GLPSmid and GLPSepi 1 month after CABG (P<0.05). However, there was no significant differences in the absolute value of GLPSendo (P>0.05) and absolute values of GLPSendo, GLPSmid and GLPSepi 3 months after CABG (P>0.05). At 1 month and 3 months, PSD decreased significantly (P<0.05), but there was no significant difference in the absolute value of PSD 1 week after CABG compared with the preoperative value (P>0.05).

Conclusions: Layer-specific strain technology provides a quantitative evaluation approach for LV systolic function and synchronicity before and after CABG in CAD patients. As a novel parameter in assessing LV systolic synchronicity, PSD is worthy of clinical popularization.
MODIFICATION OF ADENOSINE TRIPHOSPHATE STRESS-ECHO ALGORITHM

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Objectives. It was shown previously that in 16-18% of cases of stress-Echo with standard monotonous adenosine triphosphate (ATP) infusion at dose of 140 or 150 µg/kg/min stable vasodilation is not achieved. In this study we decided to analyze if modified algorithm of ATP infusion with stepwise increase (140-175-210 µg/kg/min) of vasodilator dose a) is safe, b) can help to achieve stable vasodilation stage (steady decrease of systolic blood pressure by 5 mm Hg or more), which coincides with submaximal myocardial hyperemia.

Methods. Modified ATP infusion algorithm was tested in 13 healthy volunteers (male 9, mean age 35.3±11.0 years) and in 19 patients with coronary heart disease (male 18, mean age 62.4 ± 7.4 years, multivessel disease 15). All subjects underwent left ventricular ATP 4D strain-stress-Echo (Vivid E95, AFI technology).

Results. In 9 healthy subjects and in 16 patients infusion of initial ATP dose (140 µg/kg/min) led to steady decrease of systolic blood pressure by 5 mmHg or more. In 4 (30%) healthy subjects and 3 (14%) patients it was necessary to increase ATP dose in order to get fall in blood pressure. In all cases no major complications (complete heart block, bronchospasm, myocardial infarction) were registered and no aminophylline injections were required. Only minor side effects of ATP infusion (flushing, neck tightness, lightheadedness, dyspnea, atypical chest pain, and pulse acceleration) were noted. Three times systolic blood pressure decreased below 90 mm Hg, but simple reduction in speed of infusion immediately fixed this problem. During phase of adequate vasodilation interpretable Echo data sets were obtained in all cases.

Conclusions. Modified infusion algorithm with stepwise increase of ATP dose is safe and well tolerated by subjects. It is possible in all cases to achieve stable vasodilation stage and obtain correct Echo data sets.
CONSTRUCTION AND PRELIMINARY RESULTS OF THREE-SYNCHRONIZATION DUAL REAL-TIME INTERACTIVE TELE-ECHOCARDIOGRAPHY CONSULTATION SYSTEM

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Objectives: To explore the feasibility, clinical significance and popularization value of tele-echocardiography consultation based on Internet cloud service technology.

Methods: Relying on the 4G Internet cloud service platform, using unique dynamic image codec and synchronization technology to integrate multi-dimensional communication information such as voice, text and pictures, we have constructed the tele-echocardiography consultation platform of Henan Provincial People’s Hospital and two primary hospitals 300 kilometers apart. 45 patients were consulted through the tele-echocardiography consultation platform.

Results: 45 patients achieved teleconsultation through the tele-echocardiography consultation platform. The total time spent was about 341.31 minutes, and the average length of consultation for each patient was 7.58±6.17 minutes. There were 5 patients diagnosed with congenital heart disease, 34 patients with acquired heart disease, and 6 patients excluded with cardiac abnormalities. Compared with the initial diagnosis results of the primary hospitals, the consultation specialists newly discovered 7 cases of abnormal diagnosis, accounting for 16% of the total number of consultations; confirmed 6 cases of initial diagnosis, accounting for 13% of the total number of consultations; excluded 6 cases of suspicious diagnosis, accounting for 13% of the total number of consultations; and answered a number of difficult questions. The expert opinions of the remaining 26 cases were basically consistent with the initial diagnosis of primary hospitals, accounting for 58% of the total number of consultations. Patient and doctor satisfaction is 100%.

Conclusions: The three-synchronization dual real-time interactive tele-echocardiography consultation system based on Internet cloud service and unique dynamic image codec and synchronization technology has good feasibility and practicability, and is worthy of widespread application.
EVALUATION OF LEFT VENTRICULAR SYSTOLIC SYNCHRONY IN PATIENTS WITH ESSENTIAL HYPERTENSION BY PEAK STRAIN DISPERSION

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Objectives: To investigate the clinical application value of peak strain dispersion in evaluating left ventricular systolic synchrony in patients with essential hypertension.

Methods: Fifty-five patients with primary hypertension were divided into two groups according to the criteria for left ventricular hypertrophy (LVH): non-LVH (NLVH) group with 30 cases and LVH group with 25 cases. 30 healthy subjects were chosen as controls. All three groups received transthoracic echocardiography to collect 2D images of apical four chamber and three chamber views, and two chamber long axis view of LV for three consecutive cardiac cycles. The myocardial layer-specific strain was used to measure the longitudinal peak strain of the left ventricular myocardium of subendocardium, the middle layer, the subepicardium, and the myocardial strain and the peak strain dispersion of the whole myocardial layers. The standard deviation (PSD) of the longitudinal strain peak time of the left ventricle was calculated. The PSD difference between the three groups was compared, and the correlation between PSD and each parameter was analyzed.

Results: Compared with the control group, the PSD of the NLVH group and the LVH group increased, the difference was statistically significant ($P<0.05$). Compared with the NLVH group, the PSD of the LVH group increased, the difference was statistically significant ($P<0.05$). In EH group, PSD had positive correlation with left atrial diameter (LA), left ventricular end-diastolic diameter (LVIDd), inter-ventricular septum thickness (IVSd), left ventricle posterior wall thickness (LVPWd), left ventricular mass index (LVMI), relative wall thickness (RWT); $r=0.385, 0.366, 0.765, 0.778, 0.717, 0.739, P<0.01$).

Conclusions: Left ventricular systolic synchrony decline in patients with essential hypertension in early stage; PSD can be used to evaluate left ventricular systolic synchrony early and quantitatively, and it has certain advantages in evaluating left ventricular myocardial contraction synchronous changes in patients with essential hypertension. The method is simple and easy to implement and worth promoting.
CONTRAST-ENHANCED LUNG ULTRASOUND: WHAT EVERYONE SHOULD KNOW

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Objectives
Contrast ultrasound (CEUS) has been implemented in multiple areas of the body, having been underutilized in the assessment of lung lesions. Several studies have shown its usefulness in the study of subpleural lung pathology. The learning objectives are:

- To describe the bases of pulmonary vascularization.
- To explain the exploration technique of pulmonary CEUS.
- To list the indications of the lung CEUS and the typical findings of the different pathologies that can present as peripheral pulmonary lesions.

Materials and methods
We will review the physiology and pathophysiology of pulmonary vascularization. We will describe the pulmonary CEUS technique. We will review the ultrasound findings collected in our daily clinical practice and compare the most representative cases with the existing research works.

Results
Passive atelectasis had a short enhancement time, pronounce in arterial and parenchymal phases. Patients with pulmonary infarction presented absence of early enhancement. Pneumonias had a short enhancement time. Peripheral neoplasms presented a delayed and poor enhancement pattern, with central neoplasms having a combined pattern between neoplastic and obstructive atelectasis. We will also discuss the problems of CEUS in the distinction between pneumonic adenocarcinomas and pneumonias due to atypical germs. We will also review cases of pulmonary abscesses, radiation pneumonitis and combined patterns.

Conclusions
CEUS is a tool in the diagnosis of peripheral pulmonary pathology that is in full expansion. We must know the physiology and physiopathology of contrast-enhanced ultrasound, as well as the enhancement patterns of each pathology.
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ULTRASOUND’S ROLE IN THE DIAGNOSIS OF CHILDHOOD PILOMATRIXOMA: "KEY POINTS"

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Objectives
To review the main radiological features which are seen in the childhood pilomatrixoma.
To show the usefulness of ultrasonography in the diagnosis of this entity.
To provide radiological keys which can help us when the features are atypical.

Methods
Pilomatrixomas are uncommon childhood tumors that usually appear in the head and neck. Excision is usually recommended as a foreign body reaction due to calcification of the lesion may occur and a inflammatory response with risk of scarring can develop. Their clinical diagnosis is difficult, so image techniques (above all ultrasound) are very important to reach an early diagnosis and correct treatment. A retrospective study was carried out by examining the cases of 15 patients which were diagnosed of pilomatrixoma in our hospital in the last year. The preoperative ultrasound scans were reviewed. To reach our objectives a ultrasound with high frequencies probe were used.

Results
In the majority of patients, sonography either correctly supported the clinical diagnosis of pilomatrixoma which is seen as a ovoid complex mass, often with calcification at the junction of the dermis and subcutaneous fat, with target appearance (hypoechogenic connective tissue capsule and central hyperechogenic epithelial cells). Only in two cases ultrasound results weren’t conclusive. These last cases presented atypical features, so in this work we also provides some keys which can help us to avoid uncorrect diagnoses when the clinical-radiological context is uncommon.

Conclusions
We found ultrasonography of suspected pilomatrixomas in childrens to be a very useful and noninvasive procedure which let to reach an important improvement in the accurate diagnosis and treatment of these lesions which aren’t free of complications.
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ULTRASOUND-GUIDED MANAGEMENT FOR CHRONIC SHOULDER PAIN

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Objectives
To evaluate the efficacy of ultrasound-guided management for treating refractory chronic shoulder pain.

Methods
This study comprised subjects with chronic shoulder pain (pain periods more than 3 months) referred from outpatient clinics. Patients received an ultrasonographic examination with compression test to make sure there was no other possibility and no contraindication to injection were enrolled. Every patient should sign the informed consent form before injection. An ultrasound-guided injection of mixed lidocaine 15% dextrose into the affected site (muscle, enthesis); normal saline mixed with 1cc shincort into shoulder joint for adhesive capsulitis were performed. We evaluated effectiveness of our treatment by obtaining visual analogue scale (VAS) score for pain at the target area, before treatment and 3 months later after treatment.

Results
We performed 278 ultrasound-guided injections from Aug. 2015 to Dec. 2018 and return to our outpatient clinic for follow-up. The patient number in different target locations were 100 in infraspinatus muscle, 50 in teres minor muscle, 37 in levator scapular muscle, 14 in coracoid process, 10 in rhomboid muscle, 26 in trapezium and 33 with adhesive capsulitis. The mean age of treated subjects was 59.1 (44 y/o to 85 y/o). The mean pre-treatment reported visual analogue scale (VAS) score was 7.0 (4-10). When interviewed 3 months after treatment, 22% of subjects reported complete resolved symptoms at the treated site. Three subjects reported no response or worsening of symptoms after treatment (7%). The mean of reported post-treatment visual analogue scale (VAS) score was 1.83. There were no significant reported immediate adverse reactions or complications following the intervention.

Conclusions
Ultrasound-guided injection of mixed lidocaine 15% dextrose for shoulder myofascial pain and normal saline mixed with 1cc shincort into shoulder joint for adhesive capsulitis resulted in statistically significant improvement of clinical symptoms.
EXOTIC PATHOLOGIC ENTITIES AFFECTING THYROID: A REVIEW OF SONOGRAPHIC FINDINGS

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Objective: To summarize unusual sonographic findings in thyroid arising from regional or systemic disorders and analyze sonographic features of these exotic lesions.

Methods: Each type of disease will be illustrated using a selected case with ultrasonography. Sonography was performed with a high-frequency linear array probe. The location, size, shape, and echogenicity of these lesions were recorded. Corresponding gold standard for diagnosis of each disease was simultaneously present in form of graphs.

Results: Seven subtypes were enumerated as following: Intrathyroidal parathyroid adenoma, Intrathyroidal thymus, metastases of nonthyroid malignancies (NTMs) to the thyroid, esophageal diverticulum, paratracheal air cysts, ossification of anterior longitudinal ligament, Langerhans cell histiocytosis(LCH). Among these disorders, metastases of NTMs to the thyroid and LCH could manifest as diffuse lesions in thyroid on sonogram while other disease often present with nodule or mass like appearance. It may due to the different pathogenesis when these disorders affect thyroid.

Conclusions: The anomalies identified in thyroid should be carefully evaluated to rule out disorders of nonthyroidal origin. Featured sonographic appearance of these lesions can guide us for further assessment using specific procedures.
COMPARISON OF THE SONOELASTOMETRIC PROPERTIES OF A TUMOR IN PATIENTS WITH MESOBLASTIC NEPHROMA, NEPHROBLASTOMA, AND CLEAR CELL CARCINOMA OF THE KIDNEY (PILOT STUDY)

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Background
Mesoblastic nephroma, nephroblastoma and clear cell carcinoma of the kidney are characterized by both different age peaks of morbidity and frequency of occurrence (there is an absolute prevalence of nephroblastoma). According to the SIOP 2001 protocol, if nephroblastoma is suspected in cases of localized tumors, chemotherapy is carried without a histological examination. The decisive role in the choice of diagnostic and treatment tactics is played by visualizing methods. However, their effectiveness in some cases has its limitations.

Objectives
To compare the sonoelastometric characteristics of the tumor in patients with mesoblastic nephroma, nephroblastoma and clear cell carcinoma of the kidney.

Methods
There were 3 patients. According to the results of a surgical intervention from they were diagnosed mesoblastic nephroma (girl 3 months), nephroblastoma (girl 3 years old), and clear cell carcinoma of kidney (boy 15 years old). The volume of tumors was 124, 224 and 9 cm³, respectively. The primary ultrasound study, which included elastometry (2D SWE), was performed on a Logiq E9 device. The shear wave propagation velocity was measured in m/s (SWV). 6-8 measurements were carried out in 2-6 areas depending on the tumor volume (a total of 68 measurements). Results are presented as M±σ.

Results
When registering SWV the serial placement of the controlled volume was carried out with the coverage of most tumor areas in its maximum cross-sectional area. SWV values were as follows: for mesoblastic nephroma - 1.81±0.17 m/s, nephroblastoma - 0.99±0.14 m/s, and clear cell carcinoma of the kidney - 1.92±0.20 m/s. The difference in SWV values for nephroblastoma and compared tumors was statistically significant (p <0.001).

Conclusions
The obtained data can be used in the development of additional differential diagnostic criteria for a nephroblastoma and individual rarely occurring renal tumors in children.
Introduction: Diaphragmatic plication is a procedure indicated in patients with symptomatic diaphragmatic paralysis (PD). Because PD in the pediatric population generates greater cardiopulmonary repercussion, this procedure is of vital importance. Although in our environment, the most used diagnostic method is fluoroscopy, it is a qualitative method and generates radiation.

Objectives: The objective of this research is to support the usefulness of ultrasound as a quantitative measure without the need for radiation in the pre and postoperative diagnostic assessment of diaphragmatic excursion in patients with suspected PD.

Materials and methods: We present a cross sectional study of patients with PD due to complication of cardiovascular procedures, where the diagnosis is a multidisciplinary challenge that defines whether the patient is taken to diaphragmatic plication by open thoracotomy. We present the social and demographic variables of our population and the statistical comparison between ultrasound and fluoroscopy for the evaluation of the diaphragmatic excursion.

Results: Of the patients who were plicated for 5 years, 20 patients were studied with fluoroscopy and diaphragmatic ultrasound. The average age was 22.6 months, 57.2% of the patients were male. Among the cardiovascular comorbidities, the most frequent were ventricular and interatrial communication, respectively. In 5 patients, fluoroscopy showed diaphragmatic paralysis. In two of them, a chest ultrasound was also performed in which adequate diaphragmatic excursion was evidenced for both patients. Of the 5 patients, three were taken to right diaphragmatic plication, evidencing in the total absence of diaphragmatic excursion by ultrasound.

Conclusions: Diaphragmatic ultrasound is a diagnostic tool that allows quantitative assessment of the diaphragmatic excursion in real time without the need to irradiate patients. Likewise, it allows a statistically significant comparison in the postoperative follow-up of the diaphragmatic plication.
ULTRASOUND ASSESSMENT OF LOW URINARY TRACT SYMPTOMS IN YOUNG FEMALE PATIENTS WITH IRRITABLE BOWEL SYNDROME

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Low urinary tract symptoms (LUTS) are often reported in female patients with irritable bowel syndrome (IBS). This study aimed to explore static and urodynamics ultrasound of bladder in the assessment of LUTS in BS patients.

Patients and Methods: 40 consecutive young female patients (under 45 years old), with confirmed IBS, assigned into 2 groups: LUTS positive vs. LUTS negative and 10 healthy controls joined this study, after ruling out a lot of diseases and conditions. Assessment of urge to void (UV), cystalgia (C) and latency (L) were scored from 0=absent to 6=very severe. Biochemistry and microbiology work ups were run. Abdominal and pelvic transparietal high resolution Duplex ultrasound (General Electric E9) with detrusor measurements as bladder wall thickness (BWT), urodynamics with voiding percentage and bladder ejection fraction (BEF), as well as pelvic CT/MRI were performed.

Results Controls displayed BWT= 4,27mm ±0,125mm, and BEF=96,520% ±1,151%. LUTS scoring in study group was: UV=3,05±1,00, C=2,10± 0,97, L=.2,00±0,97. Significant differences regarding both BWT=5,3725 mm ± 0,1758 mm vs. 4,3650 mm± 0,2277 mm; p<0,0001 and BEF= 76,050% ± 6,886% vs. 91,475% ± 2,702%, p<0,0001 were observed in favor of LUTS positive patients. Strong correlations between BEF, UV( r= -0,91, p<0,0001) and C(r= -0,47, p=0,03), and also between BWT, UV(r=0,78, p<0,0001) and C(r=0,47,p=0,03) were noted in study group.

Conclusions Transabdominal ultrasound examination provided reliable static and dynamic bladder measurements, allowing appropriate LUTS assessment. Significant modifications of BWT and BEF were recorded in study group. A close link of BWT and BEF to UV and C was also noted.
SONOGRAPHIC FEATURES OF THE IATROGENICALLY ALTERED BREAST

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Objectives:
1. To illustrate a range of sonographic findings of the iatrogenically altered breast (post-needle procedures, post-surgery, post-augmentation, post-radiation).
2. To minimize overinterpreting/underinterpreting the findings

Background:
Sonography is often used to evaluate postsurgical breast, similar to non-operated patients with palpable lump or mammographic abnormalities. The sonographic findings of iatrogenically altered breast are usually anticipated and clinically insignificant. But sometimes, even if the imaging findings are detected incidentally, those may represent significant complication or recurrence. Iatrogenic alterations of the breast in cancer treatment patients can simulate recurrent tumor in some cases and mask recurrence in others, complicating detection of recurrent neoplasm. So it is important for radiologist to be familiar with the sonographic appearance of a variety of iatrogenically altered breast.

Imaging Findings or Procedure Details
Iatrogenic alterations of the breast are numerous and varied in their histologic and sonographic features. When the alterations are the result of treatment for breast cancer, it is important to distinguish iatrogenic alterations in normal anatomy from recurrent tumor. In some cases this is not possible with imaging studies alone, and biopsy is necessary. In other cases, sonographic is prone to characterize the alterations into falsely high BI-RADS categories compared with mammography. Patients who may have fat necrosis and who have suspicious findings sonographically should undergo spot compression mammography, and mammograms should be compared with prior films before recommending biopsy based on the sonographic findings alone. Patients who have undergone lumpectomy without primary closure of the lumpectomy cavity and patients show have undergone reduction mammoplasties are particularly prone to develop fat necrosis and exuberant scarring severe enough to result in false-positive sonography findings.

Conclusions.
The role of ultrasound in the iatrogenically altered patients are follows;
1. Correctly characterize acute or chronic iatrogenic alterations.
2. Detect recurrent carcinoma
3. Detect new and unrelated abnormalities.
ULTRASOUND EXAMINATION VERSUS CONTROLLED ATTENUATION PARAMETER FOR THE DETECTION AND QUANTIFICATION OF HEPATIC STEATOSIS

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**Objectives:** Transient Elastography with Controlled Attenuation Parameter (CAP) was recently introduced as a noninvasive method for quantification of liver steatosis. The aim of this study is to assess the performance of ultrasound (US) compared to CAP for the detection and quantification of liver steatosis.

**Methods:** 323 patients aged 22-83 (54.7±13.5), 44% male (142/323), 56% female (181/323) with or without different chronic hepatopathies were included in the study. All patients were assessed by US and CAP using Transient Elastography (FibroScan, EchoSense) during the same session in fasting conditions. US examinations were performed by EFSUMB level 1 qualification practitioners using high tech US systems. We used the following cut-offs for quantifying liver steatosis by CAP: 230-275, 275-300 and >300 db/m for mild, moderate and severe steatosis (S1, S2, S3) following the recommendations of the manufacturer. US classification of liver steatosis was based on the comparison between liver and renal cortex echogenicity; grade 0 – echogenicity equal to the renal cortex, grade 1 – increased echogenicity and no posterior attenuation, grade 2 – increased echogenicity and posterior attenuation without obscuring the diaphragmatic outline, grade 3 – echogenic liver with posterior attenuation that obscures the diaphragmatic outline.

**Results:** Based on the cut-off values proposed (CAP) steatosis distribution was 28.8% / 23.2% / 15.8% / 32.2% for S0 / S1 / S2 / S3. By means of US steatosis distribution was 31.6% / 23.5% / 20.4% / 24.5% for S0 / S1 / S2 / S3. Regarding hepatic steatosis US was significantly correlated with CAP score (r=0.77, p<0.001). When divided in normal and pathological patients the correlation remained strong (r=0.83, p<0.001 respectively r=0.76, p<0.001). Using CAP as reference, the area under receiver operating characteristic curves (AUROC) of US to predict S1, S2 and S3 were excellent (0.89, 0.90, respectively 0.93, p<0.001).

**Conclusions:** US examination is a useful and cheap tool for clinical practice in the screening and quantification of hepatic steatosis, even in the hands of a novice.
Objectives. In this study we aimed to assess if transabdominal colon ultrasonography (US) can help to differentiate various activity of inflammatory bowel disease (IBD) in children.

Methods. 60 children with IBD were examined. According to clinical features and laboratory abnormalities all subjects were divided in three groups (28 without signs of active phase of disease, 24 with mild activity and 8 with severe activity). US parameters of colon wall structure and thickness, compression elastography (CE) of colon wall (Giannetti A. et al classification, 2013) and mesenteric lymph nodes (Madoka K. et al classification, 2007) were analysed. To evaluate intraluminal passage US exam was performed before and after use of osmotic laxative.

Results. In 1-st group wall thickness was 2.5-3.0 mm, distinct stratification and regular gaustration was visualised, passage disturbances, blood flow increase and lymph nodes enlargement were not detected. CE demonstrated predominantly 1B type (green) of colon rigidity.
In 2-d group wall thickness was 2.5-3.0 mm, there were no signs of blood flow augmentation, lymphadenopathy and ascites but stratification disorders with increase in colon wall echogenicity and deformed gaustration were found. At CE predominantly 2 BA type of rigidity was detected.
In 3-d group wall thickness was more than 3 mm, severe disturbances in colon stratification and gaustration, local increase or decrease in wall echogenicity, augmentation of blood flow, intraluminal passage disorders and signs of inter-loop ascites were revealed. In 4 cases during colon wall CE 1 A (blue) type of rigidity and in 4 – 2 BA type were detected. CE of lymph nodes demonstrated 3-4 types of rigidity.

Conclusions. US and CE colon and mesenteric lymph nodes data correlates with activity of IBD in children. CE 1 A type of rigidity indicates appearance of fibrotic colon wall changes.
VCTE-BASED AND QELAXTO-BASED LIVER STIFFNESS MEASUREMENTS ARE OVERLAPPING IN THE ASSESSMENT OF LIVER-TRANSPLANTED PATIENTS

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Objectives
Evaluation of liver stiffness measurements (LSMs) by Vibration-controlled transient elastography (Fibroscan®, VCTE) is an established surveillance tool useful also in longitudinal monitoring of liver transplant (LT) patients in real-life clinical practice. Availability of a technique measuring LSMs during standard echography is attractive:QElaXto® (QE), MyLab™Eight Platform (Esaote, Italy), is a point shear wave elastography technique that has been proven to be accurate for staging liver fibrosis. Preliminarly to a clinical application, the aim of this study is to establish that the two techniques give overlapping results in the context of LT patients, because the various elastography systems may yield different values for any given liver, reflecting technological differences.

Methods
VCTE and QE were performed in the same session in random order and LSMs acquired and accepted as reliable according to the standard modes. 196 consecutive LT patients were enrolled. Median age 65 years (range 23-83); median follow up after LT: 134 months (range 3-412), 77% males. 171 patients were clinically stable with no feature of liver disease (81 of whom had cured HCV and 88 suppressed HBV). Twenty-five patients had signs of active liver disease: 6 NASH, 11 biliopathy, 5 HCV advanced cirrhosis, 3 chronic rejection.

Results
The two methods showed similar results, as shown in the table, and only seven (4%) patients were classified in two different fibrosis classes.

<table>
<thead>
<tr>
<th>Reliable LSMs, rates</th>
<th>VCTE</th>
<th>QE</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>94%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>LSMs, median range</td>
<td>5.5 kPa (3.2-46.5)</td>
<td>5.5 kPa (3.0-27.8)</td>
<td>0.74</td>
</tr>
<tr>
<td>Pearson’s correlation</td>
<td>r= 0.92</td>
<td>&lt; 0.0001</td>
<td></td>
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<tr>
<td>CCC between the overall reliable values</td>
<td>0.86 (95% CI: 0.83-0.88)</td>
<td>Accuracy: 0.93</td>
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</table>

Conclusions
VCTE and QE showed a good correlation in the assessment of liver stiffness in LT patients and each of the two devices could be used interchangeably in the context.
HOW CAN WE PREDICT THE PATHOLOGICAL CONDITION OF AXILLARY LYMPH NODES DURING ULTRASONOGRAPHIC EVALUATION?

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Ultrasonography is the first step in the diagnosis of axillary mass. Enlarged lymph nodes are widely diagnosed as nonspecific reactive nodal hypertrophy to metastatic lymph node or lymphoma. In malignant diseases, especially breast cancer, an accurate assessment of the status of the axillary lymph nodes is important for staging and treatment planning. In many benign diseases, it may lead to hypertrophy of the axillary lymph nodes. Sometimes soft tissue tumors of the axilla may be confused with lymphadenopathy. Therefore, ultrasonography of the axilla requires accurate understanding of anatomy, situational technique, and should know the sonographic criteria of normal and abnormal lymph nodes. And also we should know the ultrasound characteristics of diseases that may occur in axilla other than the lymph nodes.

Ultrasonography can help to predict the pathologic condition of lymph nodes by size, shape, echo pattern, etc. of the lymph nodes, evaluate blood flow with color-Doppler ultrasound, and determine elasticity as sono-elastography. The possibility of pathologic diagnosis through sono-guided aspiration or biopsy in case of suspected pathologic condition may also be an advantage of ultrasonography.

Ultrasonographic findings of the axillary lymph node can be used to predict the cause of disease more accurately with reference to the patient’s general systemic condition and determine the necessity of biopsy. Here, we will show the normal anatomy of the axilla, the normal ultrasonographic findings of axillary lymph nodes, criteria for pathologic lymph nodes, and histological examination methods.
THE FACTORS INVOLVED IN BILATERAL CENTRAL LYMPH NODE METASTASIS OF ISTHMUS PAPILLARY THYROID CANCER

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**Objectives** The aims of this study were to evaluate the rate and risk factors involved in bilateral central lymph node metastasis in patients with papillary thyroid cancer (PTC) found in the isthmus and compared them to tumors located in other thyroid regions, using those findings to establish a surgical strategy for treating these tumors.

**Methods** We compared the clinical and pathological data of 48 patients with isthmic PTC and 141 patients with PTC found in other thyroid regions, all of whom underwent total thyroidectomy and bilateral central neck dissection.

**Results** The rates of bilateral central lymph node metastasis were higher in the isthmus group than in the non-isthmus group (29.2% vs. 9.9%; *p*=0.001). On multivariate analysis, the isthmic location of the tumor was an independent risk factor for bilateral central lymph node metastasis (OR=3.458; *p*=0.005). But the positional relationship between the tracheal midline and the nodule was not clear in lymph node metastasis in the isthmus group.

**Conclusions** Bilateral central neck dissection should be considered for isthmic PTC regardless of the relation between nodule and tracheal midline because of the high rate of bilateral central lymph node metastasis.
USEFULNESS OF THYROID CLINICAL ULTRASOUND FOR THE EMERGENCY PHYSICIAN

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Objectives: We present the case of thyroid nodule diagnosed with ultrasound by emergency physician (EP). Ultrasound is the imaging test of choice and should be performed by the EP in any subject with suspicion of thyroid nodules; it allows establishing the size of a nodule, to reveal the existence of additional small nodules and to identify the presence of adenopathies, also it allows estimating the risk of malignancy of the nodule depending on the presence or absence of certain characteristics. The use of standardized classification systems that assign a category or risk of malignancy to each nodule, like the most widespread, the TI-RADS (Thyroid Imaging Reporting And Data System) is likely to become a standard in clinical practice in the coming years.

Methods: A patient with a tumor in the middle-right cervical region with a final diagnosis of papillary thyroid carcinoma.

Results: A 48-year-old woman admitted to the ED with a tumor in the middle-right cervical region of the neck that had been growing for 2 months. An ultrasound performed by the EP showed a heterogeneous nodule of 5.9x5.2 mm in the right thyroid hemisphere with three hyperechoic punctate images that did not produce acoustic shadows. A puncture-aspiration with an eco-guided fine needle was informed as suspicious of papillary thyroid carcinoma. After total thyroidectomy, the pathologist's final report being that of papillary carcinoma with oncocytic changes.

Conclusions: Clinical ultrasound performed by the EP has proven to be a very useful and relevant tool in their daily exercise, since it improves the management of many urgent pathologies, helping to quickly guide potentially serious pathologies such as the case we present. It has the ability to complement clinical thinking with ultrasound findings, improving the quality of care, avoiding generating unnecessary referrals to other levels of care and shortening patient waiting times.
EMERGENCY ULTRASONOGRAPHY OF ACUTE PENILE PATHOLOGY.

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Objectives:
To describe the role of ultrasonography imaging in penile emergencies, such as fracture, priapism, Mondor's disease or tumor pathology.

Background:
The penis is an accessible organ to ultrasound, which is the imaging technique of choice for the initial assessment of penile pathology, allowing an anatomical and functional study through the doppler study of vascularization.

Findings/procedure:
Acute lesions in the penis are rare and are often related to traumatic and infectious causes, being less frequent priapism or tumor pathology. The fracture of the penis is an infrequent urological emergency, characterized by the rupture of the corpus cavernosum and the tunica albuginea. Its treatment is surgical and urgent to avoid anatomical and functional sequelae. Thrombosis or thrombophlebitis is present in the superficial dorsal vein of the penis (Mondor's Disease): caused by repeated trauma, Doppler ultrasound is essential for its diagnosis. Priapism is a prolonged penile erection not associated with sexual desire. Priapism is broadly classified as low-flow (ischemic) or high-flow (arterial or nonischemic). It is also appropriately assessed by color doppler ultrasound. Tumors can be primary, usually squamous, or metastatic carcinomas of the lung, bladder, or prostate. In this article, we review a series of cases of penile urgencies, where we describe the main ultrasonographic characteristics.

Conclusion:
Ultrasound is the technique of choice in the study of the acute pathology of the penis, which allows the anatomical and vascular study of it. In this article, we describe the echographic findings in the main emergencies of the penis, such as fractures, priapism, Mondor's disease or tumor pathology.
DOPPLER ARTIFACTS: THE USEFUL AND THE MISUNDERSTOOD. A PICTORIAL REVIEW OF HOW DOPPLER ARTIFACTS CAN BE USED TO AID DIAGNOSIS.

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Introduction:
Doppler ultrasound has proven its usefulness in the determination of Doppler shift direction and representation of flow velocity within the interrogated area. It is imperative that the operator is aware of the various factors that can contribute to Doppler artifacts, in order to avoid misinterpretation of these findings. On the other hand, the presence of certain Doppler artifacts can increase the operator's diagnostic confidence of certain pathologies. This pictorial exhibit aims to explain specific Doppler artifacts as well as discuss and illustrate how these can be utilised to aid in diagnosis of specific pathologies.

Methods:
Ultrasound Doppler cases performed at our institution from 2010 to present were reviewed retrospectively. A pictorial review with actual case illustrations will be presented. Where available, correlation with other imaging modalities, such as X-ray, Magnetic Resonance Imaging (MRI) and Computed Tomography (CT), will be made.

Conclusion:
Ultrasound Doppler artifacts can play a distinctive role in adding diagnostic value to the imaging of specific pathologies. The operator must first comprehend the factors that affect the Doppler signal, to avoid misinterpretations. Some artifacts, such as aliasing, twinkling and colour bleeding artifacts, can be extremely useful to aid accurate diagnosis. This in turn can reduce further unnecessary investigations and allow timely management of the patients.
RESULTS AND TRENDS OF NINE YEARS WITH ULTRASOUND ELASTOGRAPHY (FIBROSCAN®)

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Introduction: Ultrasound-based Elastography (Fibroscan®) is a technique used for noninvasive assessment of hepatic fibrosis. It is a useful tool assessing patient’s prognosis and predicting treatment responses.

Objectives: To analyze etiology, demographic features and results in explorations made in a Health Area of Southwestern Europe during the last nine years.


Results: During this period of time, 3272 explorations were made in 2202 patients. The average age was 52 years (10-87), with 62.4% of males. 363 tests were made by year, maximum of 508 in 2015. Most of explorations came from the same Health Area of Southwestern Europe (60,2%); and services of Hepatology (68,6%), Infectious diseases (15%) and Internal medicine (9.6%). The main etiologies were: HCV (46%), hepatitis B virus infection (17%), HIV+ HCV (11%), Non-alcoholic fatty liver disease (NAFLD) (8.7%), hypertransaminasemia (3.2%). Using the established values for HCV, there are 74% patients with F0-F1, 12% with F2, 9,7% with F3 and 14.5% with F4. Obesity is the main limitation for this technique (10%), so the XL probe performed 49% of explorations in 2018. Procedures due to HCV have plummeted from 50% in 2015 to 21% in 2018, whereas indications for NAFLD currently represent 30% of total examinations.

Conclusions: Progressive HCV eradication along with increasing NAFLD have dramatically changed indications for this technique. Obesity is the main limitation for this technique, leading to increasing use of XL probe over the last two years.
ULTRASOUND FINDINGS IN PSEUDOCIRRHOSIS

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INTRODUCTION

Pseudocirrhosis defines the morphological alterations of the liver that resemble cirrhosis in patients lacking the typical histopathological findings of this disease. It is seldom described in metastatic livers in patients receiving chemotherapy. Surveillance of potential complications of portal hypertension (PHT) is mandatory.

CASE REPORT

A 42-year-old woman is referred to Hepatology Unit because of progressive elevation of liver function tests and radiological findings. She has a history of an operated breast cancer with brain and liver metastasis, having received treatment with radiotherapy, hormonal therapy, chemotherapy and immunotherapy. Computerized tomography (CT) showed two hypervascular lesions and signs of chronic liver disease with portal hypertension related complications such as ascites and abdominal varices. Complete etiological study of liver disease was unremarkable and biopsy of one of the focal lesions confirmed breast metastasis. An abdominal ultrasound (US) was performed showing an irregular liver parenchyma with conspicuous fibrous tracts and ascites (Figure 1). Doppler helped identify intrahepatic veno-venous fistulas (Figure 2). Liver stiffness measured by hepatic transient elastography was 6.3 kPa (IQR/M<10%; success rate: 100%). Hepatic venous pressure gradient ruled out clinically significant portal hypertension and neither esophageal nor gastric varices were identified during gastroscopy.

DISCUSSION

Pseudocirrhosis represents a hepatic manifestation of metastatic cancer. It has been mainly related to metastatic breast cancer receiving chemotherapy although it may appear in other metastatic cancers. Radiological findings in US include scarring and capsular retraction, liver nodularity and fibrosis. Vascular disorders may play an important role in its physiopathology and findings such as intrahepatic fistulas may be seen during examination. Patients may be completely asymptomatic, show elevation of hepatic enzymes, progression to liver failure or debut with a PHT complication. Coordinated follow-up and treatment of this patients by Oncologists and Hepatologists may be beneficial. Further studies are necessary to improve the understanding and treatment of this recently described entity.

Figure 1. Liver ultrasound showing a lobulated liver contour with an irregular parenchyma. Portal vein diameter is within normal range (7 mm).
Figure 2. Doppler ultrasound allows visualization of abnormal communications between venous vessels (intrahepatic veno-venous fistulas).

Figure 3. Marked irregular parenchyma where hyperechoic lineal tracts are visible consistent with fibrosis.
CLINICAL ULTRASOUND IN EMERGENCY ROOM HAS UTILITY IN THE ACHILLES CALCIFYING TENDINOSIS

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Objectives: We presented a case of calcification of the Achilles tendon diagnosed through the ultrasound performed by the emergency physician (EP). The calcification of the Achilles tendon is the evolution of a chronic tendinopathy or tendinosis. The histological changes of tissue degeneration that characterize the chronic tendinopathy can be observed echographically and include intrasubstance tears, changes in the echo-structure, infiltration by neovessels and intratendinous calcification, being careful with the anisotropy artifacts that can simulate tendinopathy.

Methods: A patient with incapacitating pain over the right heel with diagnosis of an enthesopathy of the Achilles tendon

Results: Male, 52 years old, admitted into the ER for 2 months of pain over the right heel. We appreciate hypersensitivity and pain on palpation in the tendon insertion, noticing a thickening and swelling in that area. In the clinical ultrasound performed by the EP there is evidence of an increase in the thickness of the Achilles tendon of 0.98 cm in diameter, with hyper-densities that cause posterior acoustic shadows in the area of Achilles tendon insertion at the level of the calcaneus together with an increase in vascularity. All this indicates an acute enthesopathy of the Achilles tendon as result of the evolution of the calcifying tendinosis that the patient suffered. Was prescribed rest, ice, NSAID, high heel and lately was resected the calcification by ultra-minimally invasive, eco-guided surgery.

Conclusions: Clinical ultrasound performed by the trained EP plays a fundamental role in the assessment of the Achilles tendon due to its low cost, dynamic nature, because it is accessible and non-invasive and allows an excellent contralateral comparison. Ultrasound allows us to reduce waiting times in the care and diagnosis of the patient and allows us to reduce costs by rationalizing complementary tests and achieve the routing of the patient to the appropriate levels of care.
ABDOMINAL ULTRASOUND AS A DIAGNOSTIC TOOL FOR DISTAL OBSTRUCTION INTESTINAL SYNDROME

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INTRODUCTION
Abdominal pain, distension and vomiting are frequent symptoms in patients diagnosed with cystic fibrosis (CF). Abdominal ultrasound (AUS) may be a useful and safe diagnostic alternative to computed tomography (CT) in the diagnosis of distal obstruction intestinal syndrome (DIOS), helping rule out other diseases with similar clinical features.

CASE REPORT
Two patients diagnosed with CF and pancreatic insufficiency presented with difficulty in passing stool, vomits and abdominal pain during the last week. Abdomen examination was painful at the right iliac fossa, where a mass was palpable. DIOS was suspected and AUS was therefore performed, showing small bowel dilatation and hyperechoic luminal content consistent with a mucous plug (Figures 1 and 2). Due to oral intolerance, sodium meglumine diatrizoate (Gastrografin) enema was administrated followed by polyethylene glycol (PEG) oral preparation, achieving relief of symptoms. PEG was prescribed to prevent further episodes.

DISCUSSION
DIOS is a gastrointestinal complication in CF with blockage of the bowel lumen, normally at the terminal ileum, by inspissated muco-faeculant material. History of meconium ileus or DIOS, pancreatic insufficiency and dehydration are implicated risk factors. Patients present with acute or subacute colicky abdominal pain, distension, vomiting and a right lower quadrant palpable mass. Diagnosis was traditionally made following abdominal X-ray or CT. Nevertheless, as AUS is becoming more and more available, it is now considered a helpful and safer imaging modality because of avoidance of ionizing radiation. Other conditions such as constipation, appendicitis, intussusception, volvulus or fibrosing colonopathy must be taken into account in the differential diagnosis of DIOS. If possible, conservative management (oral or rectal administration of PEG or Gastrografin) must be considered in first instance. In severe or refractory cases, surgical approach may be necessary. As recurrence is frequent, increase of fluid intake, optimization of pancreatic enzyme replacement therapy and prophylaxis with laxatives are recommended to promote bowel transit.

Figure 1. Bowel ultrasound showing dilatation of ileum (17 mm), with a normal wall (3 mm) and hyperechoic content in the lumen. Reduced peristalsis (back-and-forth movement of echoes inside fluid-filled bowel) is patent.
Figure 2. Bowel ultrasound showing hyperechoic material within the ileum lumen in a patient with CF. These imaging findings are consistent with DIOS.
USEFULNESS OF CLINICAL ULTRASOUND IN THE EMERGENCY ROOM IN COMPLICATED URINARY TRACT INFECTIONS

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Objectives: Given the clinical suspicion of pyelonephritis with findings suggesting renal colic, imaging tests should be performed to assess the existence of dilation of the urinary tract, whose fundamental treatment will be the correction of the obstructive cause immediately by means of stent drainage ureteral with double-J catheter or placement of a tube of percutaneous nephrostomy, being able to carry out a definitive treatment of elimination of the obstructive cause in a second time when the septic condition is resolved.

Methods: A patient with lethargy, fever, right flank pain and septic condition with a final diagnosis of obstructive urinary sepsis.

Results: An 80-year-old man admitted to the ER with lethargy, fever and chills, after 72 hours of pain in the right flank irradiated to hypogastrium and lumbar region, associating nausea, vomiting and low-grade fever in the last 24 hours. Analytically presents septic parameters. The emergency physician (EP) performed a clinical ultrasound that revealed a hyperechoic image with a posterior acoustic shadow of 8.8 mm in the right proximal ureter with proximal ureteral dilatation of 7.7 mm, compatible with obstructive ureteral lithiasis, findings that were confirmed by abdominal tomography. The urologist placed a double-J catheter and was admitted to the ICU for the treatment of obstructive urinary sepsis.

Conclusions: Clinical ultrasound performed by EP trained in this technique allows an assessment of the patient with a clinic suggestive of nephritic colic. It is capable of detecting the presence of lithiasis, including those that are not visible in a radiographic study due to its composition, and what is more important, the degree of dilatation of the excretory urinary tract at the renal and ureteral levels. In view of its high efficacy, low cost, immediacy, safety and portability, ultrasound at the bedside is a fundamental procedure in the care practice of emergency medicine.
CAN WE USE BOWEL ULTRASOUND AS A TOOL TO PREDICT THE RISK OF SURGERY IN PATIENTS WITH CROHN’S DISEASE?

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Objectives

Strictures are the most common cause of surgery in patients with Crohn’s Disease (CD). Up to date there are no identified features in Restricturing Crohn’s Disease (SCD) that can predict the precise risk of surgery. Bowel ultrasound (US) is becoming useful in the management of SCD; given its accessibility and similar diagnostic yield when compared to traditional diagnostic tools. In our study, our aim was to determine ultrasonographic features in SCD that may be associated with a higher risk of surgery.

Methods

We conducted a retrospective case-control study, including patients diagnosed with SCD via ultrasound (US) from 2013 to 2017 who had undergone surgery at the time of the analysis (surgery group). We paired each one of them with two non operated SCD patients (control group). Main target was evaluating ultrasonographic findings associated with a higher risk of surgery. Features analyzed were bowel wall thickness, loss of layer pattern, degree of parietal vascularization using doppler, involvement of mesenteric fat, presence of pre-stenotic dilation, and association of penetrating complications such as fistulas or abscesses. We used Student’s T and Chi² tests for quantitative and qualitative variables comparison respectively, and performed multivariable analysis using logistic regression. We considered statistical significance a p value of < 0.05.

Results

When comparing US findings, the following ones reached statistical significance: parietal vascularization (p<0.001), presence of fistulas (p=0.003) and abscesses (p=0.004). When performing multivariate analysis, these data appear to have clinical significance regarding risk of subsequent surgery but they didn’t reach statistical significance probably due to lack of sample size.

Conclusions.

In our experience, transmural complications detected in a follow-up US of patients with SCD are associated with a higher risk of surgery and should be taken into account when deciding the best choice of treatment.
SUPRASPINATUS TENDON AND SOFT TISSUES SONOGRAPHIC CHARACTERISTICS WITH SHOULDER PAIN.

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OBJECTIVES
The Supraspinatus tendon injuries present the highest prevalence in shoulder pathology. The health waste for this pathology treatment results interest in order to minimize and looking for a way to prevent and improve the quality of life of patients.

An observational study was carried out in population with comparing Supraspinatus tendon pathology and asymptomatic population. The correlation between the tendon-muscle-fat and the other variables in the two groups was evaluated.

METHODS
Ethics committee of the University Hospital 12 Octubre in Madrid was submitted. Patients with the defined inclusion/exclusion criteria were selected from the rehabilitation service. An experienced sonographer conducted sampling with a Samsung Medison Co., Ltd. South Korea model HS40, linear probe (L5-12/50) and 50 mm footprint, optimized with a specific preset and a setup for patient and sonographer position too. The post acquisition image analysis with the free program “ImageJ” was used.

RESULTS
Of the 16 participants, 58.8% women with an average age of 48.94 ± 14.9 years, with 71.69 ± 9.2 kg, and 1.69 ± 0.06 m high and a BMI of 24.9. 29.4% have left shoulder pain and 52.9% RH. 82.2% had a traumatic cause of pain 35.3% take medication and 17.6% were infiltrated. Compared to the tendon and muscle on the contralateral side, we found no statistically significant differences (P = 0.38 and P = 0.11) but with the thickness of the fat (P = 0.02). We only find correlation between VAS-time variables with pain in the left shoulder (Rho = 0.73; P < 0.001) and right shoulder (Rho = 0.73; P < 0.001), and muscle-tendon in the left shoulder (Rho = 0.74; P = 0.02).

CONCLUSIONS
The muscle-tendon-adipose relationship could correlate in shoulder pain in Supraspinatus pathology and could be relevant in its recovery.
ASEPSIS IN ECO-GUIDED INTERVENTIONISM: ADVANCES

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OBJECTIVES
It is increasingly common the use of ultrasound by physiotherapists to help different techniques and is important to maintain correct asepsis conditions to avoid infection. We’ve revised the limited current literature, guidelines and protocols and we have tried to summarize different methods of antisepsis, to try to set a guide of the different ways to achieve an aseptic field when we use the ultrasound.

It is increasingly common the use of ultrasound by physiotherapists, furthermore in the dry needling and Electrolysis. In interventional sonography it is very important to maintain correct aseptic conditions to avoid possible infectious complications.

METHODS
We have revised the limited current literature with use of database and consulting specific books. We also evaluate the asepsis used in different health centers.

RESULTS
In interventional ultrasound techniques is very important to keep asepsis. It’s necessary to take precautions to avoid infection during the use of an ultrasound probe during an intervention. We must disinfect the area to explore and use gloves to avoid direct contact of the ultrasound probe with the skin of the patient.

In the case of ultrasound-guided infiltrations or other treatments (pricks) is recommended the use of a chlorhexidine solution or iodinated (powerful antiseptic, fast action).
We always must use gloves, better sterile.

In indirect techniques with marking skin before doing the intervention is recommended a conventional aseptic condition (use of antiseptic on the surface to be treated once marked the point. We must try to avoid that the puncture site have transmitter gel.

CONCLUSIONS
Although there is consensus on the importance of asepsis when performing ultrasound-guided interventions, there is limited literature about it, and differences in how to apply it. We believe it is an important issue that should be known by everyone who makes these techniques.

Poster presentations
SAFETY AND EFFICACY OF A DEFEICATION CARE ALGORITHM BASED ON ULTRASONOGRAPHIC BOWEL OBSERVATION IN JAPANESE HOME-CARE SETTINGS: A SINGLE-CASE, MULTIPLE-BASELINE STUDY

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Objectives
Older patients have difficulty to accurately communicate their subjective symptoms, because of dementia. Constipation is one of the problems. Nurses have difficulty assessing the type of constipation by physical assessment and may therefore struggle to design an appropriate regimen for defecation care. Although our previous studies described the ultrasonographic observation of fecal retention in the colon and rectum, the clinical usefulness of using ultrasonography remains to be established. The objective of this study was to verify the safety and efficacy of defecation care for functional constipation based on hand-held ultrasonographic observations in home-care setting in Japan.

Methods
Home-care patients with suspected functional constipation were recruited for this multiple-baseline, single-case study. Intervention points were shifted by one week had an investigation period of 10 weeks. A total of 15 older adults were stratified to 3-, 4-, 5-, or 6-week intervention phases. Ultrasonographic observations of fecal retention in the colorectum and defecation care based on observations were conducted as intervention. Tau-U was used to confirm the efficacy of the intervention by measuring the number of non-artificial and artificial defecations as well as the number of hard stools passed each week. In addition, weekly use of non-stimulant or stimulant laxatives, enemas, and suppositories was evaluated.

Results
No adverse events were reported. Statistical analysis indicated reduced incidence of hard stool and artificial defecation. The associated effect sizes were significant (Tau = −0.48, p < 0.01; Tau = −0.53, p < 0.01). Use of stimulant laxatives was reduced as well as the use of glycerin enemas; the associated effect sizes were significant (Tau = −0.56, p < 0.01; Tau = −0.34, p = 0.04).

Conclusion
Defecation-care based on ultrasonographic assessment by nurses in home-care settings is safe and effective to improve constipation symptoms and reduce laxative use.
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REPRODUCIBILITY OF SHEAR WAVE ELASTOGRAPHY IN AN ELASTICITY PHANTOM AND ASSESSMENT OF THE PHANTOM ACCURACY BY MEANS OF IN VITRO STIFFNESS MEASUREMENTS

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Objectives:
To investigate the reproducibility and agreement of shear wave elastography (SWE) values among operators, machines and probes. The secondary aim was to assess the embedded inclusions’ values in terms of accuracy and to evaluate the effect of depth on SWE.

Methods:
In vitro stiffness measurements of six inclusions (10kPa, 40kPa and 60kPa) embedded at two depths (1.5cm and 5cm) on a CIRS Multi-Purpose, Multi-Tissue ultrasound Phantom, Model 040GSE were used. The measurements obtained by two sonographers. Each inclusion was assessed 10 times by each sonographer using two different vendors’ ultrasound machines; the Aixplorer system using the XC6-1, SL10-2 and SL18-5 probes, and the LOGIQ E9 using the 9L-D probe. To measure the intra-operator variability, a coefficient of variation (CV) was used and the reproducibility was calculated using an intraclass correlation coefficient (ICC).

Results:
For Shallow inclusions, low variability was observed between the results obtained by each operator. However, the variability increased significantly as the depth increased. Operators showed almost perfect agreement in ICC. The machines operated by the SL10-2 and 9L-D probes showed near-perfect agreement for the shallow inclusions. The SL10-2 and SL18-5 probes in the Aixplorer system showed near-perfect agreement for the shallow inclusions in ICC as well. It was established that the mean of the 10kPa inclusions’ stiffness overestimated by 15.7%, while those at 40kPa and 60kPa underestimated by 41.93% and 47.6%, respectively. The depth effect on SWE values was inconsistent in probe SL10-2, whereas, in probe XC6-1 it was significant.

Conclusions:
SWE appears to be reproducible amongst operators and machines; given the optimum use of probes for each depth. Stiffness of the hard inclusions appeared to be significantly less than the reported values by manufacturer. This study recommends against the use of phantom for the future assessment of shear wave technique as it is unreliable.
CONFIDENCE LEVEL OF MEDICAL STUDENTS IN IDENTIFYING ABDOMINAL STRUCTURES AFTER ULTRASOUND SESSIONS INTEGRATED WITH PHYSICAL EXAMINATION SKILLS

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Objective:
To determine the confidence level and understanding of first year medical students in identifying abdominal structures by using a wireless portable ultrasound scanner on simulated patients during integrated physical examination skills sessions.

Methods:
Participants of the study are California University of Science and Medicine -School of Medicine, year 1 MD students. During the clinical/physical examination skills course (CM-5700) on the gastrointestinal and renal systems, ultrasound practice sessions were conducted on simulated patients with portable wireless scanners. All sessions were supervised by qualified faculty members. Afterwards, students were requested to complete an anonymous survey.

Results:
According to preliminary results, most students were not extremely confident in identifying the major abdominal organs on ultrasound (all students ranked themselves 3 or 4 on a 5-pt Likert scale). However, without faculty assistance, 100% of students were able to identify and locate the liver, kidneys, and aorta, 88% located the urinary bladder, 75% identified the inferior vena cava (IVC), and 63% located the spleen. Students only required faculty assistance to identify the gall bladder (100% identified with assistance). One-Hundred percent agreed that ultrasound helped to improve their physical examination skills through understanding of anatomy (85.7% “Agree”, 14.3% “Strongly Agree” on a 5-pt Likert agreement scale). Seventy-One percent strongly agreed that ultrasound is an excellent tool in the basic science curriculum.

Conclusion:
Integrated sessions of ultrasound during the clinical skills sessions can help students to connect clinical skills in real time with clinical anatomy and physiology. The results of this longitudinal study will help to develop an ultrasound curriculum during the preclinical years, to supplement the understanding of basic medical sciences integrated with clinical skills in accordance with the ACGME modified competencies for medical students.
PREOPERATIVE ULTRASOUND COMBINED WITH BIOCHEMICAL PARAMETERS FOR PREDICTING CANCER AMONG PATIENTS WITH PARATHYROID TUMORS LARGER THAN 15MM: A CASE-CONTROL STUDY IN CHINA

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Objectives: To verify whether ultrasonographic findings in combination with biochemical parameters can better predict malignant tumor among patients whose parathyroid lesions > 1.5cm in largest dimension.

Methods: The retrospective case-control study enrolled 30 patients with parathyroid carcinoma matched to 60 patients with parathyroid adenoma or hyperplasia by admission year. All the patients were diagnosed with primary hyperparathyroidism(PHPT). Ultrasonic features of the two groups, as well as demographic, clinical and biochemical characteristics were retrospectively compared and selected to correlate with histological findings. Best subset selection and multivariate logistic regression analysis were conducted to identify the independent risk factors of PC. A decision curve analysis was performed to evaluate the applicability of new model.

Results: The two groups exhibited significant differences in terms of gender, serum median intact parathyroid hormone (PTH), calcium(Ca), phosphorus(P), alkaline phosphatase(ALP) and symptoms. Ultrasonic features of size(the maximum diameter in dimension), DR(two diameters' ratio), shape, infiltration, echogenicity and calcification were significantly different as well. ROC curves were performed to determine the best cut-off values for predicting cancer were 509pg/ml, 2.88mMol/l, 156IU/l, 2.05cm and 1.86 for PTH, Ca, ALP, size and DR, respectively. Best subset selection method and multiple logistic regression analysis showed that ultrasonic features of DR and infiltration in conjunction with serum PTH level were independent predicting factors for malignancy. Meanwhile, DR, shape and infiltration will become risk factors if only including ultrasonic features into multivariate analysis. No significant difference was identified between the two models regarding AUC. Decision curves confirmed the utility of two models with a threshold probability of 0-0.5.

Conclusion: Models including ultrasonic features solely (AUC:0.942, sensitivity:0.800, specificity:0.933, PPV:0.857, NPV:0.903) or combined with PTH level (AUC:0.956, sensitivity: 0.800, specificity:0.912, PPV:0.828, NPV:0.902) both have an excellent predictive capacity and thereby have a better potential to facilitate decision-making clinically.
VALUE OF HITACHI SHEAR WAVE ELASTOGRAPHY (SWE) FOR NON-INVASIVE EVALUATION OF LIVER FIBROSIS AND COMPLICATION OF CIRRHOSIS

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Aim:
To assess the value of the Hitachi SWE for the non-invasive evaluation of liver fibrosis and complications of liver cirrhosis.

Methods:
Our study included 179 persons with or without liver disease. Liver stiffness (LS) was measured with Hitachi SWE (Arietta V70) and Transient Elastography (TE) (FibroScan Echosens). TE was used as reference method for classification of the degree of fibrosis. The following TE cutoff values were used (Tsochatzis et al – JHepatol 2011; 54: 650-659): F≥2: 7 kPa F≥3: 9.5 kPa and F4: 12 kPa. Reliable LS Measurements with both methods were defined as median value of ten valid measurements with an IQR/Med < 30% and expressed in kPa.

Results:
Our cohort included 37 healthy volunteers, 94 patients with chronic liver disease and 48 patients with clinical signs of liver cirrhosis.
The rate of reliable LS measurements was significantly higher for Hitachi SWE than TE: 97.7% vs. 86.5%, p=0.0002.
Hitachi SWE has very good reproducibility: the Concordance correlation coefficient (CCC) was 0.75 and 0.72 for intra- and interoperators.
Mean LS in healthy volunteers was 4 ± 0.9 kPa (median 3.8 kPa).
The mean LS values in patients with chronic liver disease were: F0/1 (n=45) 4.7±1.1 kPa, F2 (n=14) 6.3±1.9 kPa, F3 (n=6) 8±1.5 kPa, F4 (n=20) 9.7±2.7 kPa.
The cutoff value of Hitachi SWE > 5.1 kPa had 97.5% Se, 75.6% Sp, 78% PPV, 97% NPV and 85.8% accuracy for predicting the presence of F ≥ 2 (AUC 0.93).
The cutoff value of Hitachi SWE < 7.1 kPa had 89.2% Se, 85% Sp, 95% PPV, 70.8% NPV and 88.2% accuracy to rule out the presence of cirrhosis (AUC 0.92).
LS values assessed by Hitachi SWE (kPa) were similar in patients with and without esophageal varices: 14.9±7.1 vs. 12.6±4.1, p=0.13 and significantly higher in patients with ascites compared to patient without: 17.1±8.1 vs. 12.1±3.1, p=0.01.

Conclusions:
Hitachi SWE seems to be a good method for non-invasive evaluations of liver fibrosis.
DIAGNOSTIC IMAGING IN PATIENTS AFTER ENDOVASCULAR AORTIC ANEURYSM REPAIR WITH SPECIAL FOCUS ON ULTRASONOGRAPHIC CONTRAST AGENTS

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Objectives. Endovascular treatment of abdominal aortic aneurysms (AAA) constitutes an alternative to the classical surgical approach. The procedure may be complicated by specific complications including persistent flow within the aneurysm sac, otherwise known as endoleak. The main aim of the study was to assess the utility of ultrasonographic contrast agents in diagnosis of endoleaks after endovascular abdominal aortic aneurysm repair.

Methods. 198 patients with AAA were treated endovascularly. All subjects underwent follow-up examinations at 6 and 12 months after the procedure, including pre- and post-contrast ultrasound, followed by CT angiography (CTA) as a reference. Each ultrasound examination consisted of B-flow, color and power Doppler evaluation before and after contrast injection, supplemented by contrast-enhanced ultrasound (CEUS) scan.

Results. At 6 months, endoleaks were diagnosed in 16 and 22 patients during pre- and post-contrast US, respectively. CEUS verified the presence of 22 previously diagnosed and 4 new (type II) endoleaks. At 12 months, endoleaks were detected in 7 and 13 patients by means of pre- and post-contrast US, respectively. 17 patients were diagnosed with endoleaks by CEUS. None of the endoleaks diagnosed solely with CEUS at 6 and 12 months of follow-up were detected by CTA.

Conclusions. Contrast agents substantially increase sensitivity of ultrasound in diagnosis of endoleaks, type II in particular. CEUS proved to have the highest sensitivity in diagnosis of endoleaks by revealing pathologies undetected by other modalities, including CTA. CEUS may substitute CTA in surveillance of patients after stent graft deployment.
CONTRAST ENHANCED ULTRASOUND IN CHILDREN WITH FOCAL LIVER LESIONS

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1Dmitry Rogachev National Research Center Of Pediatric Hematology, Oncology And Immunology, Moscow, Russian Federation

Objectives. Differentiation between benign and malignant nature is crucial in patients with focal liver lesions. All visualization methods are still not very accurate. Contrast enhanced ultrasound (US) showed a high diagnostic accuracy in detection of malignant liver lesions in adults, but its diagnostic value in children is not yet confirmed.

Methods. 12 children (aged from 14 days to 17 years) with liver tumors and focal liver lesions were examined by contrast enhanced US with SonoVue (children under 12 years – 0,2 ml per year, but not more than 1 ml, children over 12 years – 1,5 ml). The time of observation was at least 6 minutes after intravenous injection of contrast. In 7 patients lesions were malignant (in 5 cases - hepatoblastoma, in 2 – hepatocellular carcinoma), in 5 patients – benign (in 3 cases – infantile liver hemangioma, in 1 – local hepatic steatosis, in 1 – mycotic lesion).

Results. The typical enhancement pattern of malignant liver tumors was slow, uniform, iso- or hypointense filling; the washout of contrast was noted after 3 min. Liver hemangiomas characterized by hyperintense centripetal filling with “silent” areas in the center of lesion in the first minute; the washout of contrast was noted from the 3 min 30 sec with up to 6 min remained hyperintense contrast enhancement of hemangiomas compared with the intact parenchyma. Local hepatic steatosis had no distinguishing features on contrast enhanced US – filling and washing of contrast out was isointense compared with the intact parenchyma.

Conclusions. Malignant liver tumors and infantile liver hemangiomas in children have typical features during filling and washing out of contrast. Contrast enhanced US is a safe informative method of differentiation of this two focal liver lesions in pediatrics.
CONTACT HYPOTHESIS OF A TORSIONAL WAVE PROBE ON THE HUMAN CERVIX

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Objectives: Since the conception of elastography, the scientific community have been trying to optimize it to provide a quantitative diagnosis that objectively ascertain the stiffness of the tissue, enabling clinicians to plan necessary actions with less uncertainty. Our team has developed a probe which, to become a clinical tool, must be consistent and robust in a real measuring environment, preserving the quality of the signals received in the face of alterations during the operation and operator errors.

Methods: Three non-pregnant women were recruited. Several tests were planned to validate the proposed hypotheses about contact conditions, which were later statistically analyzed by the Anova test considering a significance of p < 0.05. Cervical stiffness was obtained from the received signal velocity.

Results: The analyzed results provide a first approximation to the measurement protocol, preventing the operator from making certain errors during the test.

Conclusions: (I) the use of the speculum is recommended to avoid contact of the probe with the vaginal walls while allowing correct alignment, by visual observation, towards the cervix. (II) the use of a lubricant both for the placement of the speculum and on the probe shows hardly any effect, it is recommended to facilitate the test. (III) an off-centering greater than 1cm with respect to the external os means an increase in dispersion in the measurements, it is not recommended. (IV) pressures exerted in the range of 50 to 200 g vary the rigidity obtained, it is advisable to maintain a constant pressure during the measurement, although the non-linear behaviour of the tissue will be decisive. (V) measurements must be taken in apnea, which is achieved thanks to the short duration of the pulse emitted and the burst mode.
PERCUTANEOUS ULTRASOUND FINE NEEDLE BIOPSY IN SOLID PANCREATIC LESIONS

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¹casa sollievo della sofferenza, san giovanni rotondo, Italia, ²Ospedale San Carlo, Potenza, Italia

Objective
Recent advances in treatment of pancreatic adenocarcinoma are leading to an increasing use of neoadjuvant therapy before surgery. This could augment the number of patients who need pancreatic biopsy, until now reserved to unresectable pancreatic cancer or metastatic disease. Current guidelines suggest that a pathologic diagnosis of adenocarcinoma of the pancreas can be made using fine-needle aspiration (FNA) biopsy with either endoscopic ultrasonography (EUS) guidance (preferred) or computerized tomography (CT). EUS-FNA is highly sensitive and specific for solid lesions and provides the benefit of additional staging information at time of biopsy but require narcosys and is as an expensive procedure.
Percuraneous ultrasound-guided fine needle Biopsy (US-FNB) is a wide accepted procedure to study retroperitoneal and various abdominal lesions but it is not recommended for diagnosis of pancreatic cancer.
We aimed to assess the sensitivity, specificity, accuracy, safety and effectiveness of US-FNB in patients with suspected pancreatic lesions.

Methods
We enrolled 90 consecutive patients with a solid pancreatic lesion suspected for malignancy. All patients underwent, if possible, to US-FNB and diagnosis of malignancy was confirmed at follow-up, either at surgery or by the evolution of disease (e.g: systematic therapy, death, development of metastatic lesions). Sensibility, specificity and side effects were studied.

Results
Out of 90 patient we perform US FNB in 81 patients. 60 patients were diagnosed, with malignancy lesions of whom 55 were pancreatic adenocarcinomas, 2 metastasis, 3 neuroendocrine tumor. 6 patients had mass growing pancreatitis. The sensitivity of US-FNB was 80%, specificity was 100% and accuracy 82%.

Conclusions
In our study the sensitivity, specificity and accuracy in pancreatic lesions of US-FNB are equal to EUS-FNA. US-FNB is safe and effective. Not requiring narcosis and using simple disposable equipment US-FNB is also a cheaper technique than EUS-FNA. We suggest to evaluate its use as a valid alternative to endoscopic biopsy.
ACOUSTICAL BIOMECHANICAL PROPERTIES OF EX-VIVO HUMAN CERVIX

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Objectives
Being able to quantify the mechanical properties of the cervix is a challenge for the global health community. Dynamic elastography which depends on the propagation of the shear waves is one of the best techniques to quantify the mechanical properties of soft tissue in the field of medical applications. Torsional waves are shear elastic waves that propagate through soft tissue radially and in-depth in a curved geometry. Application of torsional ultrasound waves to sense soft tissue architecture has been proved to enable a new class of biomarkers that quantify the mechanical functionality of any soft tissue. The objective of this work is to validate that the new torsional wave elastography technique (TWE) developed by our group precisely interrogates soft tissue mechanical functionality. This is done comparing the results obtained from shear wave elastography (SWE) in 5 ex-vivo human cervix samples in the same range of frequencies.

Methods
Several tests have been carried out to obtain biomechanical results from both techniques; TWE and SWE. For this, 5 human cervix samples have been measured in the Ultrasonics Lab of the University of Granada. The torsion device proposed by the group has been and a Verasonics vantage 128 system has been used.

Results
Bio-mechanical parameters in terms of shear wave velocity and shear modulus using both SWE and TWE for ex-vivo human samples in the same range of frequency. Values from 1.8kPa to 8.0kPa where obtained.

Conclusions
Authors present the technique of TWE to determine the mechanical properties of viscous tissue. Results were compared with the ones obtained from a commercial SWE alternative. A programmable SWE-system for ex-vivo samples was implemented and evaluated. We believe that results are promising and future studies on biomechanical properties of soft tissue can rely on.
ULTRASOUND DIAGNOSTICS OF VASCULAR ANOMALIES IN CHILDREN

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¹Belarussian Research Center For Pediatric Oncology, Hematology And Immunology, Minsk Region, Belarus

Background
Differential diagnosis of vascular tumors and malformations in children includes a range of neoplastic and non-tumor lesions. Computed tomography and magnetic resonance imaging have such restrictions as the need for sedation of children, intravenous contrasting, high cost, ionizing radiation.

Objectives
To present cases of ultrasound diagnosis of prospectively established vascular anomalies in children.

Methods
There were 60 patients 1-8 years ages. Prospectively were established such nosological entity as Hemangiomas, Venous malformations, Arterio-venous malformations, Lymphatic malformations including with venous component. Were estimated such sonographic characteristics as: volume of formation, type of blood flow (arterial, venous, mixed, not determined), vessel density, vessel diameter, resistive index for arterial vessels.

Results
Ultrasonic diagnostics of vascular anomalies were carried out on the basis of an assessment of characteristics of formation according to criteria of shape and boundary of abnormal tissue, of acoustic density, response to compression, vascularization, the ratio of amplitude-time characteristics of blood flow. In addition to the identification of vascular anomaly, the task of ultrasound diagnostic research were to isolate the symptoms of differentiating between a vascular tumor and vascular malformation. Solid tissue in the structure of vascular formation were considered as the main ultrasonographic feature that distinguishes soft tissue hemangioma from vascular malformation. A differentiated approach to invasive therapy in group of vascular malformations requires distinguishing one type from another. The problem was solved with the help of Doppler study that allows you to quantitatively distinguish between vascular malformations with fast and slow-speed blood flow. The former included arteriovenous malformations and arteriovenous fistulas, the latter include venous, lymphatic and capillary malformations.

Conclusions
Ultrasound can be used to distinguish hemangioma and vascular malformation for criteria volume of formation and resistive index. Differential diagnostics in the group of vascular malformations is carried out according to the criterion of blood flow velocity.
EUROPEAN AND RUSSIAN TI-RADS - POINTS OF CONTACT

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Key words: ultrasound, TI-RADS, thyroid cancer
Subject: US, endocrinology, head and neck
Purpose. Comparison Russian and European versions of TI-RADS

Materials and methods. Analyzed 272 thyroid nodules by major highly specific signs of malignancy (sensitivity >70%): non-parallel orientation - 100%, irregular microlobular margins - 95%, markedly hypoechoogenicity - 97.4%, presence of microcalcines - 100%; and small signs: blurred border - 94.7%, spherical shape - 90%, presence of macrocalcines 97.4%, dorsal acoustic shadow behind nodule - 97.4 (their sensitivity <30%). Two signs had highly sensitive - a mildly or irregular decrease hypoechoogenicity - 94.4% (specificity - 36.8%) and pathological vascular pattern - 94.4% (specificity - 83.3%). In EU.TIRADS were evaluated all major and only two small signes: a mildly or irregular decrease hypoechoogenicity and macrolcimate.

Results. In 13.4% of cases in cancer tumors there were no major signs of malignancy. Both variants had specificity =53%. In Russian versions of TI-RADS the sensitivity was higher than in EU.TIRADS: 94.2% and 91.0%. The best result of the Russian variant was associated with the evaluation of more small signs. Color Doppler can be used for the evaluation of the vascularity of thyroid nodules as a small sign. However, the presence of intranodular vascularity is not the main indicator of malignancy. The formation of a pathological vascular pattern is a more important feature - chaotically located, unevenly widened, branching vessels.

Conclusions.
1. The results of stratification of thyroid nodules are similar in the European and Russian variants.
2. The most sensitive is the Russian version of TI-RADS, which takes into account additional small signs of malignancy.
FACTORS FOR THE ACCURACY OF ENDOSCOPIC ULTRASOUND FINE NEEDLE ASPIRATION (EUS-FNA) OF SOLID PANCREATIC MASSES-A REAL LIFE ANALYSIS IN A NEWLY ESTABLISHED GASTROINTESTINAL CENTER

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AIM: to investigate the factors which influence the accuracy and sensitivity (Se) of EUS-FNA of solid pancreatic masses.

METHODS: 87 Patients with 96 EUS-FNA of solid pancreatic masses performed between 2014-2018 were enrolled in this retrospective study. Final diagnosis was establish by histopathology, surgery, radiological findings, and clinical follow-up. Positive EUS-FNA was defined as the finding of at least atypical cells with dysplasia. Per definition, an experienced endosonographer has performed at least 150 EUS including 50 interventions.

RESULTS: The mean age of patients was 66.6±13.5 years. The most common final diagnosis was adenocarcinoma (66.6%), following by inflammation (9.2%), neuroendocrine tumors (8.1%). The overall accuracy was 65.6%, with lowest value in 2016 (27.2%) and highest value in 2018 (79.3%). Overall Se for detecting malignancy was 56%, with lowest value in 2016 (27.2%) and highest value in 2018 (76%). Endosonographer experience seems to influence the accuracy as well the Se of FNA. There was a significant difference in favour of 19G vs 22G needle: 66.6% vs. 36.3%, p=0.03. EUS-FNA of the larger lesions were more accurate in comparison to the smaller pancreatic masses (Table).

CONCLUSION: Endosonographer experience, needle size and size of pancreatic lesion seems to influence the accuracy and Se of EUS-FNA. We observed an overall accuracy and Se lower than reported by high volume centers, but with a significant improvement with increasing operator experience.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Sensitivity (%)</th>
<th>Accuracy (%)</th>
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<tbody>
<tr>
<td>Size:&lt;2cm(A) vs 2-4 cm(B) vs &gt;4cm(C)</td>
<td>50% vs. 51.9% vs. 76.9%</td>
<td>61.5% vs. 59.7% vs. 82.3%</td>
</tr>
<tr>
<td></td>
<td>A vs. B: p=0.81</td>
<td>A vs. B: p=0.85</td>
</tr>
<tr>
<td></td>
<td>A vs. C: p=0.36</td>
<td>A vs. C: p=0.39</td>
</tr>
<tr>
<td></td>
<td>B vs. C: p=0.18</td>
<td>B vs. C: p=0.14</td>
</tr>
<tr>
<td>Localisation: Uncinate(A) vs Head(B) vs Body(C) vs Tail(D)</td>
<td>57.1% vs. 53.8% vs. 53.8% vs. 66.6%</td>
<td>63.1% vs. 60.7% vs. 61.1% vs. 72.7%</td>
</tr>
<tr>
<td></td>
<td>A vs. B: p=0.92</td>
<td>A vs. B: p=0.92</td>
</tr>
<tr>
<td></td>
<td>A vs. C: p=0.82</td>
<td>A vs. C: p=0.83</td>
</tr>
<tr>
<td></td>
<td>A vs. D: p=0.98</td>
<td>A vs. D: p=0.89</td>
</tr>
<tr>
<td></td>
<td>B vs. C: p=0.74</td>
<td>B vs. C: p=0.80</td>
</tr>
<tr>
<td></td>
<td>B vs. D: p=0.74</td>
<td>B vs. D: p=0.68</td>
</tr>
<tr>
<td></td>
<td>C vs. D: p=0.87</td>
<td>C vs. D: p=0.81</td>
</tr>
<tr>
<td>Needle: 19 G vs. 22 G</td>
<td>64.1% vs. 36.3%</td>
<td>70% vs. 48.1%</td>
</tr>
<tr>
<td></td>
<td>p=0.04</td>
<td>p=0.06</td>
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</table>

Poster presentations
<table>
<thead>
<tr>
<th>Comparison</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stent in the main biliary duct:</td>
<td>56.2%</td>
<td>55.9%</td>
<td>0.79</td>
</tr>
<tr>
<td>(yes vs. no)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trainee vs. experienced</td>
<td>47.2%</td>
<td>64.1%</td>
<td>0.18</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>64.2%</td>
<td>64.7%</td>
<td>0.72</td>
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<td></td>
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<tr>
<td></td>
<td>57.4%</td>
<td>70%</td>
<td>0.20</td>
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</tbody>
</table>

**p-values:**
- 0.79
- 0.72
- 0.18
- 0.20
PERFORMANCE AND COMPLICATIONS RATE OF LIVER BIOPSY PERFORMED BY TRAINEES IN A NEWLY ESTABLISHED HEPATOLOGY DEPARTMENT

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INTRODUCTION AND AIM: Liver biopsy remain the gold-standard for liver fibrosis evaluation and diagnosis of certain types of liver diseases. The aim of this study was to investigate the performance and complications rate of liver biopsies performed by trainees.

METHODS: Our retrospective study included liver biopsies (for diffuse liver disease and liver tumors) performed by trainees between 01/2016-02/2019 in our newly established Hepatology-Department in a University affiliated tertiary care teaching hospital. Biopsies for liver tumors were performed with ultrasound guidance with a Tru-Cut 16G needle (TrueCore II, Argon Medical Devices), while the biopsies for diffuse liver disease were performed with a Menghini 16G (Braun Hepafix 16G) or TruCut 16G needle.

RESULTS: 142/180 (78.8%) of the liver biopsies performed during the study period were done by 8 trainees and included into the final analysis. The mean age of patients was 62.2±14.2 years (61.2% male). Biopsies for diffuse liver disease were performed in 58 cases (40.8%), while in 84 cases (59.2%) ultrasound guided biopsies to diagnose liver tumors were done. Mild pain after biopsies was documented in 19 cases (13.3%), while severe bleeding requiring blood transfusions occurred in 2 cases (1.4%; one liver bleeding and one hemothorax). Malignant etiology was present in 94% of patients with liver tumors. The main etiologies were: hepatocellular carcinoma (36.7%), cholangiocellular carcinoma (21.5%) and metastasis from pancreatic cancer (18.9%). Histology was positive in 65/79 (82.2%) cases with malignant liver tumors. In 4 cases with a first negative biopsy, a second biopsy performed by another trainee was positive in 3/4 (75%) cases. The main 3 indications for diffuse liver biopsy were: autoimmune liver diseases (40.6%), non-alcoholic steatohepatitis (25.4%) and drug induced liver injury (10.1%). Menghini 16G needle was used in 72.5% of cases for diffuse liver disease. The mean length of liver biopsy specimen was 2.3±0.8 cm, significantly longer for Menghini as compared with TruCut needle: 2.5±0.8 cm vs. 1.7±0.6 cm, p=0.001.

CONCLUSION: We observed a good performance of liver biopsies performed by trainees with a low complications rate.

Poster presentations
ASSESSING THE UTILITY OF CONTRAST-ENHANCED ULTRASOUND FOR THE EVALUATION OF URETHRAL STRICTURE DISEASE: A PILOT STUDY

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¹Thomas Jefferson University, Philadelphia, United States

Objectives
Urethral strictures are narrowings within the urethra that may lead to bothersome, obstructive urinary symptoms. The diagnosis is most commonly confirmed with cystoscopy or retrograde urethrography (RUG) which are invasive or exposes patients to radiation. In this pilot study, we examined the utility of contrast-enhanced ultrasound (CEUS) for the evaluation of urethral stricture lengths.

Methods
Patients with a single, bulbar urethral stricture diagnosed on preoperative cystoscopy and RUG who elected to undergo surgical repair were recruited from October 2018 to February 2019. Ultrasound urethrography was performed under anesthesia prior to open-surgical repair using 1cc Lumason (Bracco Imaging, Monroe Township, NJ) contrast diluted with 100mL normal saline which was administered transurethrally. Ultrasound imaging was performed using an Aplio i800 with an i8CX1 transducer (Canon Medical Systems, Tustin, CA). Stricture lengths based on RUG, 2D ultrasound and CEUS were measured by a blinded observer and compared to excised surgical specimens.

Results
To date, four patients (mean age 61 years, BMI 33 kg/m²) have been enrolled. Increased contrast enhancement surrounding the stricture was clearly observed in all patients. When compared to RUG (R=0.93) or 2D ultrasound (R=0.76), CEUS (R=0.96) showed the best correlation of measured stricture length to the excised specimen, although not statistically significant (p>0.17).

Table 1:

<table>
<thead>
<tr>
<th>Patient</th>
<th>Stricture location</th>
<th>Etiology</th>
<th>Stricture length (cm)</th>
<th>16F Cystoscopy</th>
<th>RUG</th>
<th>2D Ultrasound</th>
<th>CEUS</th>
<th>Excised specimen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proximal bulbar</td>
<td>Idiopathic</td>
<td></td>
<td>UTP</td>
<td>1.5</td>
<td>1.11</td>
<td>1.66</td>
<td>2.0</td>
</tr>
<tr>
<td>2</td>
<td>Proximal bulbar</td>
<td>Iatrogenic (prostate surgery)</td>
<td></td>
<td>UTP</td>
<td>0.5</td>
<td>0.24</td>
<td>0.58</td>
<td>0.9</td>
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<tr>
<td>3</td>
<td>Proximal bulbar</td>
<td>Idiopathic</td>
<td>0.2</td>
<td>0.5</td>
<td>0.34</td>
<td>0.64</td>
<td>N/A</td>
<td>N/A (stricture passively dilated with cystoscope)</td>
</tr>
<tr>
<td>4</td>
<td>Mid-bulbar</td>
<td>Idiopathic</td>
<td></td>
<td>UTP</td>
<td>1.2</td>
<td>1.14</td>
<td>1.23</td>
<td>1.3</td>
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</tbody>
</table>
Conclusions
Our pilot study demonstrates the ability of CEUS to accurately characterize urethral stricture lengths when compared to current standards. Further studies assessing the utility of CEUS should be performed in larger cohorts.
Objectives: The aim of the study was to assess patient selection for embolization of varicoceles based on ultrasonography. An additional objective of the work was to evaluate the results of endo-vascular treatment.

Methods: From January 2015 till August 2017, 53 patients with varicoceles diagnosed in an ultrasound examination underwent endovascular treatment. Each ultrasound examination was performed using the Logiq 7 GE Medical System with a linear probe at 6–12 MHz using the B-mode and Doppler functions. The study was performed in both the supine and standing position of the patient. The morphological structures of the scrotum and the width of the pampiniform venous plexus were assessed. Based on clinical signs and symptoms as well as ultrasound findings, the patients were selected for endovascular treatment. This procedure involved the implantation of coils in the distal and proximal parts of the testicular vein and administration of a sclerosing agent between the coils.

Results: Varicoceles were confirmed in all patients during a color Doppler scan. Diagnostic venography confirmed venous stasis or retrograde flow in the testicular vein and widened vessels of the pampiniform venous plexus over 2 mm in diameter in all patients undergoing endovascular treatment. The diagnostic efficacy of ultrasound was 100%. The technical success of the procedure was 89%. One patient had a recurrence of varicose veins (2.2%). There were no complications in any of the patients.

Conclusions: Ultrasound is the preferred method in the diagnosis of varicoceles and selection for their treatment. Testicular vein embolization is a minimally invasive proce-dure characterized by high efficacy and safety.
DETECTING PHARYNGEAL RESIDUE IN THE PYRIFORM SINUS AND EPIGLOTTIC VALLECLA BY ULTRASONOGRAPHY

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Objectives: Removal of pharyngeal residue is important for prevention of aspiration pneumonia because the residue sometimes moves into the airway and cause pneumonia in individuals with dysphagia. Assessment of pharyngeal residue in the pyriform sinus and epiglottic vallecula by noninvasive ultrasonography will be useful for the removal of pharyngeal residue. The aim of this study was to investigate the performance for detecting pharyngeal residue in the pyriform sinus and epiglottic vallecula using ultrasound examination.

Methods: Two hundred and thirty-eight ultrasound images of pyriform sinus from 35 individuals with dysphagia and 82 images of epiglottic vallecula from 26 individuals with dysphagia that were simultaneously obtained with a videodendoscopic evaluation of swallowing was used to investigate the performance for detecting pharyngeal residue. The transducer was set at the level of the laryngeal prominence in the transverse direction of the left or right sides of the neck to visualize the pyriform sinus. The transducer was set above the hyoid bone in the transverse direction to visualize the epiglottic vallecula. The scanning method was also validated by a real-time virtual sonography (fusing magnetic resonance and ultrasound images).

Results: Ultrasound images showed that high echogenicity area in the pyriform sinus and epiglottic vallecula was related to presence of pharyngeal residue. The presence of high echogenicity area resulted in a sensitivity of 92.0% and specificity of 71.9% for detecting pharyngeal residue in the pyriform sinus and a sensitivity of 86.7% and specificity of 63.6% for detecting pharyngeal residue in the epiglottic vallecula.

Conclusions: The transverse ultrasound scan at the level of laryngeal prominence and above the hyoid bone enabled detection of pharyngeal residue in the pyriform sinus and epiglottic vallecula. The assessment method for pharyngeal residue by noninvasive real-time ultrasonography will support clinical professionals to facilitate pharyngeal clearance for the prevention of aspiration pneumonia. (298 words/300 words)
Pocket-size point-of-care-ultrasound (POCUS) in the preclinical setting in rural Brandenburg due to demographic change and urbanization

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¹Medical School Brandenburg, Neuruppin, Germany

Background: Demographic change, urbanization and the shortage of physicians in rural areas of Germany can be the main threat of medical undersupply of the aging population in the near future. With further development of portable ultrasound devices, clinicians able to treat patients faster and more accurate in a preclinical setting and reduce the necessity of hospital admission.

Objective: to evaluate the use of point-of-care ultrasound (POCUS) in rural Brandenburg in improving patient care.

Methods: A group of palliative care physician, general practitioner, emergency physician, and nurses (e.g. palliative care nurse) are participating in this study. A training program consisted of a three-hour workshop and 2 weeks individual training during visits to the patient's home. POCUS is given to the participant for 6 weeks for further examination. Symptoms, examination results and changes of treatment (e.g. acute interventions, new medication) were documented in a standardized data entry form.

Results: 13 of 96 addressed general or palliative doctors attended the described workshop program and took part in the study. Three of the participating professionals were inexperienced in ultrasound and received prolonged supervision. From the 131 questionnaires evaluated, lung and abdomen were most often examined and shortness of breath and pain are the most common symptoms. 74.38% suspected diagnosis were confirmed and 63.73% change the treatment plan after diagnosis.

Conclusion: Analysis of entry data form showed that POCUS helped doctors in rural areas to provide a faster and more accurate treatment to patients in a preclinical setting. More data sample is needed to evaluate the broader application of POCUS.
ROLE OF DYNAMIC CONTRAST-ENHANCED ULTRASONOGRAPHY PARAMETERS IN THE EARLY DETECTION OF ACUTE KIDNEY GRAFT DYSFUNCTION: PRELIMINARY RESULTS

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Objectives: To identify the relevant dynamic contrast-enhanced ultrasonography (DCE-US) parameters modified in the acute kidney graft dysfunction.

Methods: Eighty-one patients with kidney transplant at the Clinical Institute of Urology and Renal Transplantation Cluj-Napoca agreed to participate in the study between October 2017 and November 2018, resulting a number of 153 examinations appropriate for time-intensity curve (TIC) analysis. The sample was evaluated according to two criteria: with (GD, n=36) or without graft dysfunction (NF, n=117) (clinical, biochemical or histological data) and respectively three groups according with proteinuria, namely normal (P0, n=105), nephritic (PNi, n=36) or nephrotic group (PNo, n=12). Using ViewBox software, 11 parameters were obtained in the whole kidney (K), the cortex (C), medulla (M) and a segmental artery (A), with weighted parameters in the cortex (wC) and medulla (wM) (value reported to the arterial parameter to decrease the variability induced by injection) and respectively the difference (Diff) between M and C values.

Results: Statistically significant differences (α=0.05), were found for the GD (with smaller values) and NF groups between the values of the following DCE-US parameters: C-mTTI, C-WoAUC, C-WiWoAUC, wC-PE, wC-WiAUC(*), wC-Wir, wC-WiPI(*), wC-WoAUC, wC-WoR, M-mTTI, wM-WiAUC (PE=peak enhancement; mTTI=mean transit time local; Wi=wash-in; Wo=wash-out; AUC=area under curve; R=rate; PI=perfusion index; *p<0.001). Statistically significant differences between DCE-US parameters according to proteinuria class, with higher values for P0 group and lowest for PNo group, were identified as follow: C-PE, C-WiAUC, C-Wir, C-WiPI, C-WoAUC, C-WiWoAUC, wC-PE, wC-WiAUC(*), wC-Wir, wC-WiPI(*), wC-WoAUC(*), wC-WiWoAUC(*), M-mTTI.

Conclusions: A potential of TIC parameters to discriminate between normal kidney grafts and kidney graft dysfunction is identified. The classification according to proteinuria also leads to significant differences between DCE-US parameters. Best discriminators could be the weighted parameters quantifying the regional blood volume for the cortex and the transit times for the medulla.
ULTRASOUND DIAGNOSIS OF NECK MASSES IN CHILDREN – CASE REPORTS

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Objectives
In children, neck ultrasonography is basically used to differentiate a solid from a cystic lesion. Based on anatomy and location we can easily diagnose the main forms of cysts. Lymph nodes can be of 3 types: reactive, lymphadenitis and lymphoma. Beside lymph nodes, there are also other solid masses, tumoral and non-tumoral. Starting from history and physical exam, we tried to differentiate neck masses based on ultrasonographic features.

Methods
Over a period of 2 years, 5 specialists in ultrasonography performed 3621 exams in our hospital: 1844 in 2017, 21 of them for neck masses and 1777 in 2018, with 18 cases clinically diagnosed as neck masses.

Results. In great majority, ultrasound properly identified reactive lymph nodes, but we also found lymphadenitis, different kind of cysts, bacterial parotitis. All patients were admitted to the hospital for neck masses, and an ultrasound exam was performed immediately. We present several cases where ultrasonography was essential for diagnosis and follow up: 1) bacterial lymphadenitis, in an infant with multiple MRSA abscesses; 2) bacterial parotitis with complications; 3) acute lymphoblastic leukemia and 4) a Hodgkin lymphoma in a pregnant 16-year old patient.

Conclusions. Diagnosis of neck masses in children is difficult, as there are many structure projected on a small area. Ultrasound examination of any neck masses in children is mandatory as the first imagistic procedure, to rule out reactive lymph nodes (the main cause of neck masses at this age) and avoid unnecessary and expensive examination. Tumoral aspect of lymph node is suggestive and help to make a provisional diagnosis and decide the next step on imagistic examination.
DIAGNOSTIC PERFORMANCE OF A NEW 2DSWE METHOD FOR QUANTIFICATION OF LIVER FIBROSIS AND STEATOSIS: SINGLE CENTRE PRELIMINARY EXPERIENCE

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Objectives: New 2DSWE method has been recently introduced by Cannon. It may be used for liver stiffness measurement (LSM), coupled by dispersion analysis, assessment of liver viscoelastic properties, and attenuation imaging (ATI). Only limited evidence exists for their clinical applicability. We aimed to test diagnostic performance of this new 2DSWE method for liver fibrosis and steatosis assessment.

Methods: We prospectively included healthy participants and patients with chronic liver diseases of different etiologies. All participants underwent LSM and ATI (5 measurements) by Applio i800 ultrasound (US) system. Transient elastography (TE) served as the reference method for both LSM (7 kPa for F≥2, 9.5 kPa for F≥3 and 12 kPa for F=4) and steatosis assessment (controlled attenuation parameter (CAP) 248 dB/m for S≥1, 268 dB/m for S≥2 and 280 dB/m for S3). LSM by TE and 2DSWE were considered reliable when IQR/median was <30%.

Results: Final cohort of 63 (87.5%) patients with paired LSM was created with median age (IQR) and BMI (IQR) of 56 (37-64) years and 27.0 (24.0-31.0) kg/m², respectively; 37 (58.7%) males, 21 (33.3%) patients had significant fibrosis (F≥2), 15 (23.8%) had advanced fibrosis (F≥3), while 10 (15.9%) had cirrhosis (F4). Pearson correlation between TE and 2DSWE was r=0.81 for fibrosis and r=0.61 for steatosis assessment. Optimal (Youden) 2DSWE cut-off values were 6.3 kPa for F≥2 (AUROC 0.909), 7.8 kPa for F≥3 (AUROC 0.931) and 9.6 kPa for F4 (AUROC 0.970). Optimal ATI cut-off (N=57) for S1 steatosis (N=39) was 0.64 dB/cm/MHz (AUROC 0.857), for S2 (N=29) 0.71 dB/cm/MHz (AUROC 0.786) and for S3 (N=22) 0.71 dB/cm/MHz (AUROC 0.788). In the group of healthy volunteers mean value of 2DSWE LSM was 4.68 (95% CI 4.16-5.21) ranging from 2.5 to 6.5 kPa.

Conclusion: New 2DSWE-Cannon is reliable method for assessment of liver fibrosis and steatosis.
DIFFERENTIAL DIAGNOSIS OF SOLID PSEUDOPAPILLARY NEOPLASM OF THE PANCREAS

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The purpose of the study: the most critical differential-diagnostic criteria of solid pseudopapillary neoplasm (SPN) of the pancreas.

Materials and methods: There has been analyzed the results of examination and treatment of 32 patients with SPN of the pancreas.

Results: According to histological examination the SPN-diagnosis was made in 83,3% observations, immunophenotype characteristically common for SPN confirmed by immunohistochemical study for all the patients. According to instrumental examination methods the SPN was reported in 36,8% of patients on US data, 60% on endoUS, 77,8% on CT data, 72,7% on MRI data.

Discussion: Preoperative diagnosis of the SPN is critically important, the frequency of misdiagnosis is up to 38%. Differential diagnosis should be built on descriptions aggregation criteria, that were received on different scanning methods.

Conclusions: The detection in young women patients (up to 40 years old) of heterogeneous structured tumor with calcifications and liquid component without pancreatic hypertension, that is hypoechoic (on US examination methods), hypodense during the arterial phase of the contrast enhancement (on CT), with possibility of 82,3% may indicate the presence of solid pseudopapillary neoplasm.
DIAGNOSTIC VALUE OF 2D-SHEAR WAVE ELASTOGRAPHY IN SUBACUTE THYROIDITIS

Dr. Ioana Golu¹, dr Melania Balas¹, dr Amzar Daniela¹, dr Ioana Milos¹, dr Mihaela Vlad¹
¹University Of Medicine And Pharmacy "victor Babes", Department of Endocrinology, Timisoara, Timisoara, Romania

Subacute thyroiditis (SAT) or de Quervain thyroiditis, is the most common cause of painful thyroiditis. High resolution ultrasonography features have also been described as having a useful supporting role in the diagnosis of subacute granulomatous thyroiditis (SAT), and images are generally poorly defined hypoechoic areas with a heterogeneous echo pattern. Real-time shear wave ultrasound elastography 2D (2D-SWE) represents a technique that assesses the elasticity and the stiffness of different tissues. USE may be an additional tool, supporting other methods in the diagnosis and treatment monitoring of different diseases. Recently, the utility of 2D- SWE in thyroiditis and autoimmune thyroid disease (AITD) has been described.

The aim of this study was to analyse the applicability of different SWE methods in the diagnosis, differentiation and monitoring of SAT.

Material and method: 7 cases with SAT and the control group were represented by 52 subjects without any thyroid pathology. The diagnosis was based on specific tests. All the measurements were performed with an Aixplorer system (Supersonic Image Inc. France), using a linear high-resolution transducer 15-4 MHz. Three electrographic determinations were performed for each lobe and a mean value of stiffness was quantitatively measured and expressed in kilopascals (kPa). The patients with SAT presented a higher stiffness of the thyroid tissue than the normal thyroid parenchyma: 55.46±11.98 kPa vs 19.48 ± 6.84 kPa (p = 0.0004). The results of this study documented a significant difference in thyroid tissue stiffness (EI) between SAT at baseline and values recorded at the four-week follow-up visit. When compared with our previous date on chronic autoimmune thyroiditis (CAT) we also noticed significant differences: the EI had higher values in a SAT at diagnosis, when compared to the EI in CAT, 55.46±11.98 kPa vs 25.46±10.95 kPa (p= 0.0011)

Conclusion: Sonoelastography may be useful in the positive diagnosis of subacute thyroiditis.
A CASE OF METASTATIC MEDULLARY THYROID CARCINOMA: THYROID ULTRASONOGRAPHY, ULTRASOUND ELASTOGRAPHY AND MAGNETIC RESONANCE IMAGING ASPECTS

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¹University Of Medicine And Pharmacy "victor Babes"Timisoara, Department of Endocrinology, Timisoara, Romania

Medullary thyroid carcinoma (MTC) represents a rare form of thyroid cancer that accounts for 5-7% of all thyroid malignancies. Both sporadic and familial forms are described, the sporadic form being responsible for 70 - 75% of the cases. The clinical diagnosis of MTC is based on increased serum calcitonin in the presence of a nodular goiter.

Case presentation: A 62-year old woman was admitted to our clinic for exploration due to a progressively increasing midline neck swelling during the last 3 months. She had no prior history of radiation exposure and no family history of thyroid cancer. The patient was clinically euthyroid and the rest of clinical exam was unremarkable, with the exception of a nodular goiter. Thyroid function tests gave normal results. The Calcitonin (CT) and Carcinoembryonic antigen (CEA) levels were high (CT > 2000 pg/ml and CEA= 256.06 ng/ml), confirming the diagnosis of MTC. There was no family history of MEN2 in our patient and her serum calcium was normal (9.1mg/dl).

Thyroid ultrasound of the neck revealed an enlargement of right thyroid lobe with a small nodule, multiple heterogeneous masses in the left thyroid lobe with some calcifications and multiple pathological lymph nodes, the largest being just adjacent to the right lobe. The ultrasound elastography revealed a stiff consistency in the pathologic lymphnode adjacent to right thyroid lobe. Magnetic resonance imaging (MRI) described a large nodule in the right thyroid lobe and multiple nodules in the left lobe. She underwent a total thyroidectomy and radical neck dissections. The pathology confirmed the diagnosis of metastatic MTC, the large nodule in the right cervical part being a metastatic lymphnode, as described by the ultrasound, and not a thyroid nodule.

Conclusion: Thyroid ultrasound is extremely helpful for preoperative examination of patients with MTC, the image of the cervical region, including thyroid and adjacent lymphnodes, being, in some cases, better than MRI exam.
SONOELASTOMETRIC INDICES OF GERM CELL MIXED TESTICULAR TUMOUR

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Objectives
Modern multimodal ultrasound examination of organs and tissues includes sonoelastography. Based on the data obtained by researchers, new informative differential diagnostic criteria are being developed. The aim of the work is to study the sonoelastometric characteristics of a germ cell mixed testicular tumour.

Methods
The studied group was included 7 patients with scrotal neoplasms aged from 14 to 18 years. According to the results of the biopsy, everyone was diagnosed with a germ cell mixed testicular tumour. A multiparametric ultrasound study, which included complex elastography, was performed on a Logiq E9 device (GE MS). Shear wave propagation velocity (SWV) in m/s and tissue stiffness (El) in kPa were determined. The measurements were carried out with comparison with the intact testicular (reference) zone, including for the contralateral testicle. 6-8 measurements were performed for the estimated area of interest in 2-8 zones depending on the tumor volume. Results are presented as M ± s.

Results
The volume of solid scrotum formations ranged from 4.5 to 321 cm³. When registering the SWV, serial placement of the controlled volume was carried out in the most severe areas of the tumor according to the 2D SWE color map. SWV / El values were 2.39 ± 1.01 m/s / 22.56 ± 11.44 kPa. Similarly, the registration of SWV / El for the unchanged testicular parenchyma was carried out - 0.91 ± 0.14 m/s / 2.21 ± 0.61 kPa.

Conclusions
Was noted increased stiffness of tissue of damage zone in testicular malignancies. The obtained values of the SWV/El neoplasms (as quantitative characteristics of the elastographic properties of the tumor) need compared with reference values SWV/El of unchanged tissues region of mono- or contralateral testicular. When using equipment of different manufacturers, it is advisable to calculate relative indicators after agreeing of the reference zones.
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TRANSRECTAL ULTRASOUND IN RECTAL CANCER - DOES MUSIC REDUCE PAIN?

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Objectives
The main aim of this study was to investigate if music may help reduce patient’s anxiety and pain level during transrectal ultrasonography examination. The secondary aim was to investigate patient pain level during TRUS examination compared to colonoscopy.

Methods
The prospective questionnaire study included patients with primary rectal cancer undergoing standard transrectal ultrasonography investigation. The patients were randomized into the two groups, music - or Non-music group. Standard transrectal ultrasonography was performed in all patients. Pain was self-assessed using a Visual Analogue Scale ranging from 0 up to 10 cm, and “0” represents “no pain” and “10” is maximum painful. The following variables were included: age, height, weight, material status, intake of pain medicine during TRUS, intake of pain medicine during colonoscopy, use of any hearing aids, pain level during TRUS, and pain level during colonoscopy. The study was approved by the National Data Protection Agency, and conducted in accordance with the Helsinki II Declaration.

Results
A total of 126 patients were included, 81 (64.3%) men and 45 (35.7%) women. Sixty-six patients were randomized to the music - and 60 to the non-music group. The mean age was 68.5 years (range of 34 – 91 years). The demographic characteristics were similar in the two groups.

The mean pain score during transrectal ultrasonography in the music and non-music group were 1.95 and 2.30 (p = 0.404), respectively.

Border significance was found between TRUS and colonoscopy. The mean VAS score in TRUS and colonoscopy was 2.1 and 3.8, respectively. The patients reported the VAS score to be higher during colonoscopy compared to TRUS examination (p=0.07).

Conclusions.
It appears that listing to music during TRUS does not lower the pain level. However, TRUS is tended to be perceived as less painful compared to colonoscopy.
ABDOMINAL TUMORS IN CHILDREN - CORRELATIONS BETWEEN CLINICAL FINDINGS, LABORATORY RESULTS, ULTRASOUND AND CT/MRI

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¹University Of Medicine, Pharmacy, Science And Technology Of Targu Mures, Sincraiu De Mures, Romania

Objective. Abdominal ultrasound has a very important role in diagnosing abdominal tumors in children as many of them may not present with a clinical picture. The aim of this case series report was to evaluate the role of abdominal ultrasound in diagnosis, as the first imagistic investigation in any abdominal mass in children.

Method. The authors present 5 cases of abdominal tumors in children, all of them admitted and firstly diagnosed in our hospital as tumors: nephroblastoma, neuroblastoma, hepatoblastoma alongside with urinary bladder tumor and descending colon cancer. We mainly evaluated the correlation between ultrasound imaging and radiography, CT and/or MRI imaging. Specific investigations were required, according to provisional diagnosis based on ultrasonography, and an multidisciplinary team managed all the cases.

Conclusion. Abdominal ultrasound is the first choice in investigating abdominal tumors in children, it is non-invasive and available in many hospitals and even in general practitioner offices. In some cases it is mandatory to complete examination with a CT or MRI for the accuracy of the diagnosis that becomes unquestionable only in conjunction with pathology report.
ULTRASOUND IN BLUNT TRAUMA PATIENTS: THE NATIONAL EMERGENCY X-RADIOGRAPHY UTILIZATION STUDIES (NEXUS- CHEST)

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Objectives: The National Emergency X-ray Utilization Study (NEXUS) developed a decision instrument (DI) to identify a very-low risk population of patients with blunt trauma in whom CT imaging could be avoided. The 6 NEXUS Chest CT major criteria included: abnormal chest x-ray, distracting injury, chest wall tenderness, sternal tenderness, thoracic spine tenderness and scapular tenderness. While focused assessment of ultrasound in trauma (FAST) is often used to evaluate trauma patients, it is not yet incorporated in the NEXUS DI. In this study we sought to evaluate the added value of FAST in patients with blunt trauma.

Methods: This was an analysis of a subset of patients in the NEXUS Chest CT study cohort, consisting of adult blunt trauma patients at nine Level 1 trauma centers in the United States (12/2009 to 01/2012). Included patients had FAST (or extended FAST) assessing for abdominal/thoracic free fluid, pneumothorax, and/or pericardial fluid. Enrollment criteria were any abnormal US or three normal US. The value of thoracic US was evaluated for different combinations of NEXUS Chest CT major criteria, and correlated with the prevalence of having a major injury (MajI).

Results: Of the 3389 of 11477 (29.5%) patients who had FAST or eFAST, 3114 (92%) had normal ultrasounds. Specificity for MajI with US was 93.4 (92.6-94.3) and Sensitivity was 41.9 (33.9-49.8). Prevalence for MajI with an abnormal ultrasound in combination with any thoracic tenderness or distracting painful injury was 26% and prevalence for MI with abnormal US and abnormal CXR was 60%. Prevalence for MajI without any NEXUS criteria was 0.26% and, when combined with a normal US, dropped to 0.18%.

Conclusion: Ultrasound can be used in combination with CXR and NEXUS-Chest CT DI in risk-stratifying patients for Maj and can inform decisions about further imaging. Additionally, this adds new information about how to incorporate ultrasound findings into clinical decision-making and ultrasound education.
ARE MYOFASCIAL TRIGGER POINTS HYPOXIC AREAS? ROLE OF ULTRASOUND IMAGING IN PATIENT STRATIFICATION AND TARGETED TREATMENT

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Objectives
Myofascial trigger point (MTrP) is a principle pathophysiological unit in development of myofascial pain and postural imbalance. Dry needling (DN) of MTrP under ultrasound (US) guidance is prioritized method for treatment myofascial pain. **Hypothesis:** MTrP are spastic hypovascularized hypoxic low energy areas that can produce organismic signaling.

The aim was to assess efficacy of ultrasound to evaluate structure of MTrP on “ischemic patterns”.

Methods
We included 30 patients (18 females, aged 19–65 y.o.) with low back pain. Healthy 20 individuals (aged 18–52 y.o.) were controls. All patients underwent general exam, MRI, precise physical tests, extensive functional multiparameter neuromuscular US including M-mode, transient elastography and shear wave elastography (SWE), B-Flow (hypersensitive non-Doppler technology B-mode blood flow displaying flowing intravascular echoes, LOGIC E9 GE) of multifidus muscles. Then patients received DN of detected MTrP under US guidance.

Results
We successfully detected MTrP as hypoechoic, stiff and hypovascular small areas with different patterns of decreasing motility, contractility (muscle contracted/rested thickness) in all patient and did precise DN. After DN muscle structure improved, motility, contractility restored in 48 cases, VAS scores changed from 7.4 to 2.3 (p <0.05). Muscles SWE was 4.8±7 kPa in MTrP vs 3.1±0.3 kPa in controls and decreased to 3.4±0.4 kPa after treatment. Hypovascularity (“ischemic pattern”) size decreased from 3-4 mm to 0-1.5 mm, correlated with muscle function. Preliminary we found MTrP with more expressed hypovascular pattern, higher sensitivity and retaining levels of in individuals lower BMI. We also revealed imaging of nerves demonstrated improvement US signs of neuropathy as decreasing fascicles diameters from 1.8 to 0.9 mm in sciatic nerves after DN.

Conclusions.
MTrP are likely hypoxic areas, US hunting for “ischemic pattern” markers can be important for patient stratification and targeted treatment and prevention. Further studies including CEUS, hypoxia signaling markers are required.
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ULTRASOUND PHENOTYPE MARKERS OF METABOLIC SYNDROME

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Keywords: ultrasonography, metabolic syndrome, visceral fat

Objectives
Metabolic syndrome (MetS) definition requires presence of visceral obesity and 2/4 markers of metabolic health (T2DM, dyslipidemia, cardiovascular disease, hypertension). Ultrasound (US) imaging can provide accurate information on MetS.

The aim was to study relevance of US to evaluate phenotype markers that determine metabolic syndrome.

Methods
We analyzed data from 120 overweight patients (age 24-76 years; 65 females), BMI>30, waist circumference (WC)>110. 30 healthy subjects were controls. All patients underwent general clinical, lab tests; abdominal ultrasonography using multiparameter US of liver, bile ducts, shear wave elastography (SWE); evaluating kidney, spleen and pancreas; measuring abdominal and visceral fat (VF), dynamic US of postural stability.

Results
Higher incidence of hypertension (in 62%); hypercholesterolemia (in 45%); hyperuricemia (in 28%); hyperglycemia (in 32%); portal hypertension (in 32%) was found in obese individuals (p <0.05). We detected fatty liver in 103 patients (LF2-4), increased right lobe size (176±8 mm vs 143±4 mm), SWE (7.5±1.3 kPa vs 4.7±.8 kPa in controls respectively); nephropathy US signs in 78 patients (thinning, increasing echogenicity of parenchyma, fibrotic and hyperechoic inclusions, RI > 0.7) correlated with creatinine level, blood hypertension, liver fibrosis (> 0.8). Abdominal fat was 33±7 mm, VF was 26±6 mm (p<0.05 vs controls), poorly correlated with WC, VF correlated with liver size and SWE (r >0.85). Microbiota alteration was in 86 patients (78 patients demonstrated cholestasis). In 83 patients posture was altered (organ ptosis, weakness of abdominal wall, pelvic floor, diaphragm elevation and motion restriction). US demonstrated patterns of abdominal congestion, colon hyperpneumatosis, GERD signs, microspleenia, abdominal aorta atherosclerosis, aneurisms, mesenteric stenosis. Diabetic neuropathy signs (increase of fascicles diameter from 1.8-3.7 mm vs 0.9 mm) were detected on US in 26 hyperglycemic patients.

Conclusion
US is effective to detect and evaluate phenotype markers associated with VF, all MetS constituents, is robust and accessible approach.
ULTRASONOGRAPHIC FEATURES OF GRANULAR CELL TUMOR IN THE MUSCULOSKELETAL SYSTEM: A RARE ENTITY

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Objectives
Granular cell tumors are uncommon and they may arise in any part of the body. The purpose of this study is to delineate ultrasonographic features of a granular cell tumor in the musculoskeletal system.

Methods
Subjects were recruited from the pathology databases at our institution using the search term “granular cell tumor” between January 2002 and January 2018. Forty-three cases were identified. We excluded 29 cases in which preoperative ultrasonography examinations were not performed. Of the 14 cases that underwent preoperative ultrasonography, 3 cases of breast and 1 case of anterior neck were excluded. Eventually, 10 cases were included in this series. We analyzed shape, margin, echotexture, echogenicity, intralesional calcification, and vascularity on ultrasonography.

Results
Ten tumors were identified in ten patients (one man and nine women). The mean age was 35.8 years (range, 14–53 years). The tumors were located in the trunk (n=8), lower limb (n=1), and upper limb (n=1). The locations of the tumors were subcutaneous (n=6), intramuscular (n=2), subcutaneous to intramuscular (n=1), and dermis (n=1). The mean size of the tumors was 2.2 cm (range, 1.0–4.3 cm). Most of the tumors revealed oval or lobular shape (n=8) and well-defined or relatively well-defined margin (n=8). The echotexture of the tumors demonstrated heterogeneous (n=6) and homogeneous (n=4). The tumors were hypoechoic (n=8) or mixed echogenicity (n=2). Five of 8 cases underwent color Doppler ultrasonography, increased peripheral or internal vascularity were revealed. There was no intralesional calcification in all tumors.

Conclusions
Although the ultrasonographic features of granular cell tumors are non-specific, it should be included in the differential diagnosis of a well-defined, oval or lobular, heterogeneous or homogeneous, hypoechoic, soft tissue tumor.
ESTABLISHING RELIABILITY CRITERIA FOR A NEW TWO-DIMENSIONAL SHEAR WAVE ELASTOGRAPHY TECHNIQUE(CANON 2D-SWE): COMPARISON BETWEEN 3 AND 5 MEASUREMENTS

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Objectives: Two-Dimensional Shear Wave(CANON 2D-SWE) is a recently introduced elastography based technique for the non-invasive staging of liver fibrosis. We evaluated the reliability of 3 vs 5 measurements in a cohort of patients with or without different chronic hepatopathies.

Methods: All patients underwent liver stiffness measurement using CANON 2D-SWE(Canon Applio i800 system). The average, median, standard deviation(SD) and SD percentage(SD%) of 3 and 5 measurements were collected for each patient and compared to each other. Reliable liver stiffness measurements were defined as the median value of 5 or 3 measurements acquired in a homogenous area of liver parenchyma and an interquartile range/median(IQR/MED) <30%.

Results: We enrolled 115 consecutive patients with or without chronic hepatopathies(NAFLD, HCV, HBV). Reliable liver stiffness measurements were obtained in 97.3%(112/115) of patients. The mean kPascal(kPa) value of average, median, SD and SD% for 3 and 5 measurements were 7.2, 7.19, 0.6, 12 and 7.23, 7.2, 0.56, 9.28 respectively. The correlation of averages and medians was very good between 3 and 5 measurements(Spearman’s 0.99 and 0.98, respectively). The difference of SD and SD% was significant comparing 3 and 5 measurements (p<0.0001). However, no significant difference of averages and medians was found between 3 and 5 measurements(p=0.79, respectively p=0.25).

Conclusions: The median of 3 valid liver stiffness measurements using CANON 2D-SWE does not significantly differ from 5 measurements and seem to be sufficient for the reliable estimation of liver stiffness using this technique.

Abbreviations: HBV: Hepatitis B virus; HCV: Hepatitis C virus; NAFLD: Non Alcoholic Fatty Liver Disease
NON ALCOHOLIC LIVER DISEASE (NAFLD) IN CLINICAL PRACTICE AND WHAT LIVER ELASTOGRAPHY SHOWS US

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Introduction: NAFLD has recently been recognized as the most prevalent liver disease worldwide. Non-invasive assessment of liver fibrosis has been increasingly used instead of liver biopsy. ElastPQ is a point Shear Wave Elastography (pSWE) technique that has good accuracy for staging liver fibrosis, with similar performance compared to transient elastography (FibroScan). The aim of this study was to establish the frequency of NAFLD in daily outpatient practice and to assess the value of ElastPQ as a non-invasive tool for staging liver fibrosis.

Methods: Liver fibrosis was assessed by means of pSWE (ElastPQ; Affinity 70, Phillips). Valid liver stiffness values were defined as the median of 10 liver “non-zero” measurements in a homogenous area of liver parenchyma. The diagnosis of NAFLD was made by the presence of hepatic steatosis on ultrasound (“bright liver” with posterior shadowing and increased hepato-renal index) after excluding significant alcohol consumption. We used the following cut-off values for ruling out significant fibrosis (<F2) and ruling in advanced fibrosis (≥F3): 6.8 kPa, respectively 9.3 kPa.

Results: We enrolled 912 consecutive patients from daily outpatient practice, mean age 48±14.1 years, 59.3% male, 40.7% female, 41% with NAFLD, 33.7% with chronic viral hepatopathies [including HBV (19.3%) and HCV (14.4%)], 7% with alcoholic liver disease (ALD), and other causes 18.3%. We obtained valid liver stiffness measurements in all patients. After applying the cut-off values proposed we found that in the NAFLD group we could rule out significant fibrosis in 80.8% of cases, while 4% of patients had advanced fibrosis.

Conclusions: The main indication for performing ElastPQ in daily outpatient practice was NAFLD. pSWE using ElastPQ showed us that most of the patients did not have significant fibrosis.

Abbreviations: HBV: Hepatitis B virus; HCV: Hepatitis C virus
WHICH IS BETTER FOR THE NONINVASIVE ASSESSMENT OF LIVER CIRRHOSIS? POINT OR TWO-DIMENSIONAL SHEAR WAVE ELASTOGRAPHY?

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Objectives: The goals of this study were to compare the noninvasive diagnostic performance of two elastography techniques for the diagnosis of liver cirrhosis, in a cohort of patients with known hepatitis C virus, using Transient Elastography as the method of reference.

Methods: The study included 89 patients, aged 40-78 (60.3±8.4), 36% male (32/89), 64% female (59/89), with known hepatitis C virus, in whom liver stiffness was evaluated during the same session by means of three elastography methods: point Shear Wave Elastography (pSWE) using ElastPQ technique (EPIQ 7 ultrasound system, Phillips), Two-Dimensional Shear Wave Elastography (2D-SWE) from GE (LOGIQ E9 ultrasound system, General Electric) and Transient Elastography (TE; FibroScan, EchoSens). Reliable LS measurements were defined, for all techniques, as the median value of 10 measurements with an interquartile range/median (IQR/MED)<30%. The TE cut-off value of 12.5 kPa was used for the diagnosis of liver cirrhosis. The areas under receiver operating characteristic curve (AUROC) were used to assess the diagnostic performance of ElastPQ and 2D-SWE.GE and comparisons were made between both methods using TE as reference.

Results: Reliable liver stiffness measurements were obtained in 95.6%(85/89) of cases by means of TE, 96.7%(86/89) of cases by means of ElastPQ and 2D-SWE.GE. In the final analysis we included 82 patients which had reliable stiffness measurements with all methods. The AUROCS were calculated considering TE as the reference method. The optimal cutoff value of ElastPQ for cirrhosis was 9.88 kPa (AUC=0.93; Se=92%; Sp=94%; PPV=0.98; NPV=0.76) and for 2D-SWE.GE was 10.7 kPa (AUC=0.92; Se=83%; Sp=94%; PPV=0.98; NPV=0.59). No statistical differences were found between the two methods (p=0.91).

Conclusions: Both elastographic methods (pSWE and 2D-SWE) have similar performance for diagnosing liver cirrhosis and seem to be a promising alternative to Transient Elastography in evaluating patients with liver fibrosis.
MULTIORGANIC ULTRASOUND FOR THE DIAGNOSIS OF PULMONARY THROMBOEMBOLISM. STUDY OF CORRELATION DIAGNOSTIC TESTS.

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Introduction: Pulmonary thromboembolism is a pathology in which there is an obstruction of the pulmonary arteries by thrombi that usually migrate from the extremities. For its diagnosis, direct visualization of the thrombus is used as a reference standard in a chest angiography with contrast medium, which has been shown to have great neurotoxic potential and is contraindicated in patients with a high risk of nephrotoxicity. As well as in critical care patients who can not be transferred to the tomograph. multi-organ ultrasound (legs, heart, lung) is a diagnostic tool that allows to approach the diagnosis without the need to transfer patients or administer contrast media.

Objectives: To determine the accuracy of multiorgan ultrasound for the approach of pulmonary thromboembolism compared with angiotomography in a 320-detector tomograph.

Materials and methods: We present a pilot study of correlation with analysis of measures of central tendency, Pearson test, X². Probability pre-post test. An analysis was made in 30 patients who had clinical suspicion of acute pulmonary embolism in whom they were taken to angiography. In a blinded way, the researcher performed multiorganic ultrasound and the results were compared.

Results: We analyzed patients with a median age of 59 years of homogenous gender distribution (P> 0.05), without significant difference compared to the comparison between multiorganic ultrasound and angiotomography (X², P = 0.11). The correlation of the diagnosis in patients who had an adequate sonographic window was 68% (Pearson). the probability pos test of ultrasound compared with angiotomography were similar (P = 0.28).

Conclusions: Multiorganic ultrasound is a useful diagnostic tool for patients who are at high risk of contrast nephropathy (Mehran Score) and who can not be transferred to the tomograph. The limitations of ultrasound are given by the ultrasound window of the patients and changes in the patient's position for the different measurements.
THE VALUE OF ULTRASOUND IN THE MANAGEMENT OF GOUTY ARTHROPATHY: FROM ATYPICAL PRESENTATION

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Objectives
To review the main radiologicals features which are seen in gout. To show the usefulness of ultrasounds in the early diagnosis and follow-up of gout, when it has atypical manifestations. To provide radiological keys to avoid misdiagnosis.

Methods
A retrospective study of the cases of gouty arthropathy assessed in the last year, to which ultrasound with high frequency probe was performed as the first diagnostic test in the assessment of the acute process. The ultrasound’s findings were correlated with the analytical results and complementary MRI.

Results
The majority of the cases studied were chronic forms of the disease, which weren’t located in the metatarsophalangeal joint, being distal and proximal interphalangeal the main location.
Swelling and morphological alteration of the flexor tendons of the hand was more frequent findings, followed by locoregional hyperemia.
The color Doppler and the use of ultrasound contrast supported the diagnosis when confirming the existence of a locoregional hyperemia/hyper-enhancement that didn’t have malignant characteristics.
In all cases it showed a correct correlation with complementary MRI.

Conclusions
B-mode ultrasound accompanied by color Doppler/ultrasound contrast allows an early diagnosis of gouty arthropathy, avoiding the performance of invasive techniques (arthrocentesis).
In addition, it is an accessible technique that allows an evolutionary follow-up of chronic patients in real time and with low risk.
DIAGNOSTIC PERFORMANCE RATES OF ACR-TIRADS AND EU-TIRADS ON THE BASIS OF HISTOPATHOLOGICAL EVIDENCE

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Objectives: To analyze the diagnostic performances of risk stratification systems of American College of Radiology (ACR) and European Thyroid Association (ETA) in the characterization of thyroid nodules with histopathological diagnosis.

Methods: This study included a total of 251 thyroid nodules with histopathologically proven final diagnoses in 165 patients who had been evaluated with ultrasonography (US) between April 2013 and November 2017. US features of the thyroid nodules were retrospectively and blindly reviewed, later classified according to the TIRADS categories defined by ACR and ETA. The diagnostic performance rates in the characterization of thyroid nodules, and unnecessary fine-needle aspiration (FNAB) rates were calculated.

Results: Of the 251 nodules, 189 (75.3%) were benign and 62 (24.7%) were malignant. The diagnostic performance rates of EU-TIRADS and ACR-TIRADS in terms of sensitivity were 73% and 71%, while the specificity rates were 80% and 75%, respectively. The positive and negative predictive rates of EU-TIRADS were 54% and 90%, in comparison to 48% and 89% in ACR-TIRADS, respectively. The rates of unnecessary FNAB were 46% for EU-TIRADS and 52% for ACR-TIRADS according to the proposed criteria of each system.

Conclusions: Both risk stratification systems were demonstrated to have moderate and acceptable rates of diagnostic performance in a cohort of nodules with histopathological diagnosis. Physicians should be familiar with the strengths and weaknesses of them for optimal management of thyroid nodules.
ULTRASOUND-BASED ELASTOGRAPHY METHODS FOR PREDICTING THE PRESENCE OF ESOPHAGEAL VARICES IN PATIENTS WITH ALCOHOLIC LIVER CIRRHOSIS

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Background and Aim: Liver stiffness (LS) measurement by elastographic methods is a noninvasive technique for the evaluation of liver fibrosis, which could also be used for predicting the presence of esophageal varices (EV) in patients with liver cirrhosis. The aim of this study was to evaluate two ultrasound based elastographic methods as non-invasive markers for predicting the presence of EV, in a cohort of alcoholic liver cirrhosis patients.

Material and Method: The study included 77 patients diagnosed with compensated alcoholic liver cirrhosis, who underwent both upper endoscopy and LS assessment by two elastographic methods -Transient Elastography (TE) (Fibroscan/EchoSens) and Point shear wave elastography - Virtual Touch Tissue Quantification (VTQ) (Siemens Acuson S2000). Reliable LS measurements were defined for both methods as the median values of 10 measurements with an interquartile range/median ratio (IQR/M) <30%. We used TE as the reference method to diagnose liver cirrhosis (LS ≥12 kPa) [1]. Patients with ascites were excluded due to the impossibility to perform TE.

Results: 56 patients out of 77 had valid measurements by both elastographic methods and were included in the final analysis, 40/56 patients with EV. The best cut-off values to rule out the presence of EV in our cohort of alcoholic liver cirrhosis patients, with a NPV of 100% were: ≤20.1 kPa for TE (AUROC – 0.9; sensitivity-100%; specificity- 28%; PPV- 56%; NPV- 100%, LR- 0, LR+1.38) and ≤2.1 m/s for VTQ (AUROC – 0.85; sensitivity-100%; specificity- 18%; PPV- 52%; NPV- 100%, LR- 0, LR+1.21).

Conclusion: Using for TE the cut-off value ≤20.1 kPa and for VTQ≤2.1 m/s we can rule out quite accurately the presence of EV in patients with alcoholic liver cirrhosis.

References:
HOW MANY HCV CIRRHOTIC PATIENTS GO BELOW CIRRHOTIC CUT-OFF VALUES IN TRANSIENT ELASTOGRAPHY AFTER DIRECT ACTING AGENTS TREATMENT?

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Objective: to evaluate the liver stiffness (LS) values after DAA (Direct-acting antivirals) therapy, in patients with compensated HCV cirrhosis, who had sustained virologic response (SVR) and to highlight how many LS values become lower than the accepted cut-off for cirrhosis.

Material and Method: A number of 167 patients with compensated HCV cirrhosis who had LS>12 kPa at baseline, underwent 12 weeks DAA therapy and had SVR. 56 of them were followed up by TE 24 weeks after EOT (end of treatment) and 48 weeks after EOT (SVR48). A subgroup of 28 patients were followed up 96 weeks after EOT (SVR96). LS values were assessed by means of TE at the start of treatment (ST), at SVR12 (12 weeks from EOT), SVR24, SVR48 and SVR96, respectively. In each session, 10 LS measurements (LSM) were obtained. Reliable LSM were defined as median value of 10 measurements with Interquartile range/median ≤30%.

Results: LS mean values at SVR12 were significantly lower as compared to ST (16.6±6.87 kPa vs 21.3±8.8, p=0.002). As compared to SVR12, at SVR24 the mean LS values remained stable (16.6±6.87 vs 16.9±6.87 kPa, p=0.81) and at SVR48 the values continued to decrease, but without statistical significance (14.6±5.3 vs 16.6±6.87 kPa, p=0.08). LS was <12 kPa in 14% of patients at SVR12, in 16% of patients at SVR24 and in 27% patients at SVR48. In the subgroup of 28 patients evaluated at SVR96, the mean LS values decreased significantly as compared to SVR12 (11.6±4.6 vs. 15.5±6.2 kPa, p=0.009), and 46% had LS<12 kPa.

Conclusion: In compensated HCV cirrhotic patients, the mean LS values significantly decreased at SVR12, remained stable at SVR24 and decreased at SVR48. In the subgroup of patients followed up at SVR96, almost half had LS values lower than 12 kPa.
MULTIPLE PANCREATIC INJURIES

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Introduction
The most common pancreatic tumor is adenocarcinoma, representing more than 90\% of pancreatic tumors. We present an unusual tumor infiltration.

Clinical Case
64-year-old male, smoker and COPD. Under study due to abdominal pain radiating in the back, left costal pain and constitutional syndrome. A gastroscopy was performed, in which it could be identified a large ulcer in angular incisure, excavated with raised and irregular edges; it was suspected to be malignant without confirmation in the histological analysis. The abdominal ultrasound examination showed multiple focal lesions distributed on the pancreas, hypoechoic, well delimited, less than 1 cm, without Wirsung or bile duct dilatation. No adenopathies nor hepatic or splenic lesions could be identified. Puncture of one of the pancreatic lesions is performed, with a 22G needle. The CT showed a large lesion in the left lower lobe of the lung and disseminated minor nodules, with gastric implants and in the left colon, mediastinal, supraclavicular and peripancreatic adenopathies and adrenal metastasis. The histology of the pancreatic SOL confirmed the diagnosis of small cell neuroendocrine tumor, probably of pulmonary origin. He was referred to Oncology for chemotherapy treatment and monitoring.

Comments
The most frequent pancreatic tumor lesion is adenocarcinoma, which is presented as a single hypoechoic lesion, usually in the head of the pancreas and often with dilation of the bile duct and pancreatic duct. The identification of multiple pancreatic nodules should raise other diagnoses, such as primary neuroendocrine tumor of the pancreas, especially associated with type MEN I or, as in our case, metastasis. Pancreatic metastases represent 2-5\% of pancreatic tumors; with the most frequent primary tumors being renal carcinoma, followed by colorectal, breast and lung cancer.
THE PREVALENCE OF LIVER FIBROSIS STAGES ASSESSED BY TRANSIENT ELASTOGRAPHY: A SINGLE CENTER STUDY

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Objective: to highlight the prevalence of liver fibrosis stages assessed by transient elastography (TE) in a large cohort of patients in a single study center.

Material and Method: 22400 liver stiffness (LS) assessments by mean of TE have been performed in our Department during an 11 years period (2007-2018). The study included patients with chronic liver diseases of various etiology. In each patient, 10 valid LS measurements were obtained either with M probe or with XL probe. If no valid LS measurements could be obtained, the evaluation was declared as failure. Reliable LSM were defined as median value of 10 measurements with Interquartile range/median (IQR/M) ≤30%, and a Success Rate (SR)≥60%. To discriminate between LS stages by TE we used the following cut-offs [1]: F2 - 7 kPa; F3 - 9.5 kPa and F4 - 12 kPa.

Results: The feasibility in our cohort was 90.1%, 2238 of 22400 measurements (9.9%) were failed or unreliable. The etiology of chronic liver diseases evaluated by TE was: hepatitis C virus infection: 35% (7838 patients), hepatitis B virus infection: 20.5% (4601), dual hepatitis virus infection: 1.5% (332), alcoholic liver disease: 5.2% (1172), Non-Alcoholic Steatohepatitis (NASH): 6.8% (1518), Both Alcoholic and Non-Alcoholic Steatohepatitis (BASH): 0.3% (72) and other etiologies: 30.7% (6867). Based on TE cut-off values, the severity of liver fibrosis in our group was as follows: F<2: 9783 patients (48.5%); F2: 3132 patients (15.6%); F3: 1714 patients (8.5%) and F4: 5533 patients (27.4%).

Conclusion: Transient elastography had a feasibility of 90.1% in this large cohort, almost half of the patients (48.5%) having at most mild fibrosis, and approximately one quarter having cirrhosis (27.4%).

ASSESSMENT OF NON-ALCOHOLIC FATTY LIVER DISEASE WITH A NEURAL NETWORK USING PARAMETERS DERIVED FROM ULTRASOUND B-MODE EXAMINATION.

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Objectives: Non-Alcoholic Fatty Liver Disease (NAFLD) may lead to Non-Alcoholic Steatohepatitis (NASH) and to Cirrhosis and liver failure. Ultrasound (US) is widely used for the disease diagnosis and staging. The aim of this study is to build a Neural Network (NN) model to evaluate the impact of B-Mode US examination parameters for Steatosis assessment.

Methods: 195 LB validated patients (117 S0-S1 and 78 S2-S3) were included in our study. To calculate the Hepatorenal Index (HI) a B-Mode US examination was performed by an expert radiologist on each patient’s Right Lobe including view of the Right Kidney at the same depth. The examiner provided a diagnostic impression of each patient’s Steatosis (0-3). The input features selected were the Body Mass Index (BMI), the HI and optimum speed of sound (SSI), calculated from a US B-Mode image showing each patient’s the Liver Parenchyma. These parameters were used as inputs to a NN classifier. Our dataset was divided into training and testing sets (70%-30% of whole dataset). For the training process a three-fold cross validation (CV) was used. In order to have a more robust estimation of the model’s performance the split of the dataset and training-testing process was repeated 30 times.

Results: The classifier had a mean CV accuracy of 87.53% with 95% confidence interval (CI) 87.44% – 87.62%. The mean accuracy of test sample was 89.44% (95% CI: 89.31%-89.56%). The mean Area Under Curve (AUC) for test sample was 0.953 (95% CI: 0.944-0.962). The radiologists’ diagnostic impression accuracy against the LB for the whole dataset was 80%.

Conclusions: The NN classifier performance was superior to the radiologists’ estimation and can be used as a supplementary tool in Liver Steatosis assessment.
PERFORMANCE OF TIME-HARMONIC ELASTOGRAPHY FOR LIVER FIBROSIS ASSESSMENT AS COMPARED WITH TRANSIENT ELASTOGRAPHY

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Introduction
While most ultrasound elastography methods employ transient stimulation methods, the new time-harmonic elastography diagnostic system (THED) relies on time-harmonic vibrations in the same manner as MRI elastography (1). The aim of our study was to assess the performance of THED to diagnose different stages of fibrosis, considering transient elastography (TE) as reference method.

Material&Method
We evaluated by THED a group of 160 patients (p): (69 women and 91 men, mean age 56.5±12.4 years, mean BMI 27.9±5.2 kg/m²). The following TE cut-off values were used to stage fibrosis: F1≥6kPa, F2≥7kPa, F3≥9.5kPa, F4≥12 kPa (2). In all patients, 10 valid LS measurements were obtained in the same day, in fasting conditions, both by THED and by TE. Quality criteria: SR≥60%, IQR<30% have been used for each subject. For a better work flow we transformed the measurement units in kPa.

Results
The feasibility was 100% in both TE and THED. The best cut-off value for F1 was >1.5m/s (6.7kPa), AUROC=0.84, 95%CI (0.78-0.90), P<0.0001, Se=95.1%, Sp=21.5%, PPV=75.4%, NPV=83.3%. The cut-off value for F2 was >1.6 m/s (7.6kPa), AUROC=0.89, 95%CI (0.83-0.93), P<0.0001, Se=80.7%, Sp=81.8%, PPV=81.7%, NPV=80.5%. For F3 was >1.69m/s (8.5kPa). AUROC=0.87, 95%CI (0.81-0.92), P<0.0001, Se=75%, Sp=89.4%, PPV=79.2%, NPV=86.9%. For F4 was >1.75 m/s (9.1kPa), AUROC=0.92, 95%CI (0.87-0.95), P<0.0001, Se=80%, Sp=93%, PPV=81.8%, NPV=92.2%. There was a direct, positive and strong correlation between THED and TE: r=0.82, p<0.001.

Conclusion
The new THED system has good performance for predicting liver cirrhosis with a cut off value of >1.75 m/s (9.1kPa). There is a strong correlation between liver fibrosis measurements performed by THED and TE.

References:
EVALUATION OF LIVER FIBROSIS AND STEATOSIS IN PATIENTS WITH METABOLIC SYNDROME - PRELIMINARY DATA

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Objective: To determine the severity of liver steatosis and fibrosis in a cohort of patients with metabolic syndrome, using non-invasive methods: Transient Elastography (TE) with Controlled Attenuation Parameter (CAP) and ultrasound (US).

Methods:
55 patients with metabolic syndrome were prospectively enrolled. Evaluation of liver fibrosis and steatosis was made using TE (FibroScan) with CAP using both M and XL probes. Reliable liver stiffness measurements (LSM) were defined as the median value of 10 LSM with an IQR/median <30%. Also, steatosis was evaluated by means of US and graded in mild, moderate and severe. A semi-quantitative scale was used, according to the subjective assessment of the “brightness” of the liver as compared to the renal parenchyma and the intensity of “posterior attenuation”. When the evaluation of steatosis was performed by CAP we used the following cut-off values proposed by the manufacturer: S1 (mild) <230, S2 (moderate): 275-300 db/m, S3 (severe) > 300 db/m. On the other hand, a cut-off value of 8.5 kPa (Petta S.2016) was used to define clinically relevant fibrosis (F≥2).

Results:
Reliable LSM were obtained with TE in 94.6% (52/55). The mean age value was 59.4± 10.5, the majority of them were males 60% and the BMI was 35.1± 5.02kg/m². Moderate and severe steatosis by means of CAP was found in 7.7% and 75% cases respectively. Clinically relevant fibrosis was detected by means of TE (LSM≥8.5 kPa) in 25% (13/52) of subjects, all subjects concomitantly had CAP values ≥ 300db/m, suggesting severe steatosis. The correlation between CAP and ultrasound assessment of steatosis was strong (r=0.90, p<0.0001).

Conclusions:
In our group, 82.7% of patients with metabolic syndrome had moderate and severe steatosis by CAP and 25% of them had clinically relevant fibrosis by TE. Standard US of the liver showed good correlation with CAP for the evaluation of steatosis.
TRANSURETHRAL SHEAR WAVE ELASTOGRAPHY FOR PROSTATE CANCER: AN IN SILICO FEASIBILITY STUDY.

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Objectives
Prostate cancer is the second most common cancer in men worldwide and the fifth leading cause of death from cancer in men. The diagnosis effectiveness is still low. MRI is providing good results; however, its high cost and low accessibility holds back its wide implementation. Elastography techniques are emerging as promising imaging methods as cancer nodules are usually stiffer than adjacent normal tissue. Transrectal High Intensity Focused Ultrasound (HIFU) ablation is emerging as a focal treatment for prostate cancer and it may greatly benefit from a monitoring system. The stiffness of treated tissue undergoes a dramatic increase during the lesion formation, which provides the basis for using elastography to monitor the progress of the treatment. We propose a new elastography technique, Transurethral Shear Wave Elastography (TU-SWE) as a detection and HIFU ablation monitoring method for prostate cancer.

Methods
According to the TU-SWE technique, shear waves are propagated into the prostate as the result of applying oscillatory rotational forces on the urethral wall. If stiff lesions are present, shear wave echoes travel back to the urethra where they can be sensed. Two image reconstruction methods are developed, one based on a Reverse-Time Migration (RTM) and other based on a Genetic Algorithm (GA).

Results
Several in silico pre and post-ablation treatment scenarios were simulated by using the numerical wave propagation model developed for TU-SWE. Image reconstructions by using the two different methods were compared. The RTM successfully imaged the near side of the stiff lesion. On the other hand, the GA method reconstructed the location, size and viscoelastic properties of the lesion.

Conclusions
In silico preliminary results demonstrate proof of principle of the TU-SWE technique and warrant further studies. Applying RTM for reducing the search domain in the GA proved to be more efficient and provided improved results compared with GA alone.
HIGH-SPEED CAMERA OBSERVATION OF SHEAR WAVES GENERATED BY A TRANSURETHRAL ELASTOGRAPHY TECHNIQUE IN PROSTATE GELATINE PHANTOMS

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Objectives
A novel elastography method named Transurethral Shear Wave Elastography (TU-SWE) has shown promising preliminary in-silico results for the detection of prostate cancer and the evaluation of focal thermal treatment of such tumours. The image reconstruction methods developed for TU-SWE use a 2D forward model of the propagation of shear waves based on a Kelvin Voigt Fractional Derivative (KVFD) constitutive law solved by a finite difference time domain approach. The main objective of this work was the validation of the wave propagation model, a key component in the development of the TU-SWE technique.

Methods
Prostate-like gelatine phantoms containing visible basalt particles were fabricated using a combination of several recipes from the literature. Characterization of the viscoelastic properties of the different gelatine solutions was achieved by combining the results at low frequency (0.5 - 4.5 Hz), from rheometry oscillatory tests, and the results at higher frequency (100 - 700 Hz), from the high-speed camera observations. Optical tests using a high-speed camera were carried out to measure the displacement of the basalt particles resulting from the propagation of shear waves generated according the TU-SWE technique. Data from the optical tests was extracted by an ad hoc particle tracking algorithm. The KVFD viscoelastic parameters were extracted by fitting the wave velocity dispersion curve with its theoretical KVFD expression.

Results
Validation was achieved by comparing the observations from high-speed camera experiments in gelatine prostate-like phantoms against the results from the model that considers the derived KVFD viscoelastic parameters.

Conclusions
Displacement of particles in the phantoms due to the shear wave transmitted according the TU-SWE technique were successfully recorded by the speed-camera. The significant similarities obtained, specifically the apparent group velocity of the forward and reflected waves, as well as the amplitude attenuation of the forward wave, validated the wave propagation model.
A 71 year old man with no worth mentioning background apart from a recently surgery (programmed cholecystectomy). Discharged from the general surgery area with no complications and asymptomatic. The patient presented to the emergency department referring abdominal pain, distension and purulent exudate in the surgery suture area.

Physical examination showed 129/58mmHg, 93bpm, 24 breaths /min, 37.8ºC, patient with vagal symptoms, the surgery wound had a serohematic exudate, and redness skin around it. Abdominal palpation showed right upper quadrant pain coexisting with guarding and rebound.

Blood test showed infectious parameters: leukocytosis (22000) with 94% neutrophils, PCR 60 mg/dl, ProCalcitonin: 4 ng/ml.

Clinical abdominal echography was performed identifying a well defined area with heterogeneous content with hypo and isoechoic image in the lower quadrant of the liver showing a length of 6 cm on his long axis. This image is compatible with an abscess probable with anaerobic pathogens.

An Angio.CT was performed and confirmed our finding identifying extended collection in the surgical area apparently with extrahepatic location, with a maximal length of 10cm.

The patient was treated by laparotomy by the surgical team and started specific parenteral antibiotic therapy for Bacteroides fragilis and Clostridium isolated in the hemocultures. After 6 days of parenteral antibiotic therapy patient was discharged.
QUANTIFICATION OF CONTRAST-ENHANCED ULTRASOUND IN CROHN’S DISEASE – A COMPARISON OF DIFFERENT APPROACHES

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Objectives: Contrast-enhanced ultrasound (CEUS) is potentially useful to detect disease activity in Crohn’s disease (CD). Commonly, the CEUS data is quantified using dedicated software, where the contrast time-intensity data is fitted to a standardized curve from which several perfusion parameters are derived. However, time- and resource intensiveness as well as methodological limitations restrict its use in daily clinical practice. Furthermore, there are currently no consensus on how to quantify the CEUS data, and various research groups perform the procedure differently. The aim this study was to compare several different available quantification procedures.

Methods: 34 patients with CD were prospectively recruited. Each patient underwent ileocolonoscopy and the Simple Endoscopic Score for Crohn’s Disease (SES-CD) was used as a reference standard. The CEUS examination was performed using a Logiq E9 scanner (GE Healthcare, Milwaukee, US), combined with a recently approved ultrasound contrast agent, Sonazoid (GE Healthcare, Oslo, Norway). The perfusion analysis was performed on exported videos with Vuebox (Bracco Suisse, Geneva, Switzerland), as well as the onboard software on the ultrasound scanner. The quantification procedures included were; percentage change in contrast enhancement (Postcontrast-precontrast*100/precontrast), contrast intensity measurements in linear acoustical units (AU) and decibel (dB), and a normalized version of the contrast intensity data using a nearby artery as a reference.

Results: The perfusion parameters peak enhancement (PE), wash-in rate (WiR), wash-out rate (WoR), and the percentage change in contrast enhancement were most accurate in estimating endoscopic disease activity. The normalized versions of WiR and WoR as well as the percentage change in contrast enhancement correlated significantly with SES-CD. All corresponding contrast parameters correlated significantly.

Conclusion: CEUS enables estimation of endoscopic activity in CD. The percentage change in contrast enhancement had similar correlation with SES-CD as the normalized perfusion parameters, and due to its simplicity, the procedure may be preferred in daily clinical life.
TECHNICAL ASPECTS OF A NOVEL ELASTOGRAPHY TECHNIQUE - TIME-HARMONIC ELASTOGRAPHY (THED) AND THE LIVER STIFFNESS VALUES IN HEALTHY VOLUNTEERS

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Introduction
While most ultrasound elastography methods employ transient stimulation methods, the new time-harmonic elastography diagnostic system (THED) relies on time-harmonic vibrations similar to MRI elastography (1). The aim of this study is to evaluate how many measurements are needed for the non-invasive assessment of fibrosis by THED and also to define the normal liver stiffness (LS) values in healthy subjects by THED.

Material&Method
We evaluated by THED and transient elastography (TE) a group of 183 patients: 44 - healthy subjects (normal abdominal ultrasound, without any known liver disease and with a TE value <6.5kPa) and the rest with chronic hepatopathies. In all patients, 10 valid LS measurements were obtained in the same day, both with THED and with TE, using IQR/M <30% as a quality criterion. The following TE cut-of values were used to stage fibrosis in the chronic hepatopathies group: F1≥6.5kPa, F2≥7kPa, F3≥9.5kPa, F4≥12kPa (2).

Results
Reliable LS measurements were obtained in all 183 patients (54.6% male, mean age 56.5±12.4 years) by means of both methods. According to TE, fibrosis severity was: F4-24.5% (45/183p), F3-6% (11/183p), F2-14.7% (27/183p), F1–12% (22/183p), F0-42.6% (78/183). There were no differences between the mean LSM obtained with 5 THED measurements vs. with 10 THED measurements: 1.66±0.26 m/s vs. 1.65±0.24 m/s, p=0.48.
In the subgroup of 44 healthy volunteers (48.8% men, mean age 37.7±2.38, average BMI=25.6 kg/m2), the mean LS value was 1.49±0.01 m/s, CI 95% (1.47 – 1.51). There were no significant differences between the mean LS values in healthy men vs. healthy women, 1.52±0.06 m/s vs. 1.47±0.01 m/s (p=0.1).

Conclusion
Five valid measurements may be enough to quantify the liver fibrosis THED elastography, without significant loss of accuracy, thus reducing the examination time. The mean liver stiffness values by THED in healthy subjects was 1.49±0.01 m/s.

FIBROSIS AND STEATOSIS IN TYPE 2 DIABETES MELLITIUS PATIENTS EVALUATED WITH TRANSIENT ELASTOGRAPHY AND CONTROLLED ATTENUATION PARAMETER

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Objective: To assess the severity of liver fibrosis and steatosis in a cohort of type II diabetic patients, using non-invasive methods: Transient Elastography (TE) and Controlled Attenuation Parameter (CAP)

Method: The study included 704 type II diabetic patients prospectively randomized, evaluated in the same session by means of TE and CAP (FibroScan, EchoSens) to assess both liver fibrosis and steatosis. Reliable liver stiffness measurements (LSM) were defined as the median value of 10 LSM with an IQR/median <30%. Both, M and XL probe were used. A cut-off value of 10.1 kPa (Petta S 2016) was used to define severe fibrosis (F≥3). For differentiation between stages of steatosis we used the following cut-off values recommended by the manufacturer: S1 (mild) <230, S2 (moderate) 275-300 db/m, S3 (severe) > 300 db/m.

Results: Out of 704 diabetics screened we excluded those with associated viral hepatitis, those with an AUDIT-C score ≥8 and those with unreliable LSM. The final analysis included 485 subjects (54.3% women, mean age 60 ±9.5; mean BMI=31.6±6.1 kg/m²) with reliable LSM. 32.1% of patients had obesity grade I, 17.9 % had obesity grade II and 8.9% had obesity grade III (IMC≥40 kg/m²). Mild, moderate and severe steatosis by means of CAP was found in 15.6%, 15.6 % and 59.3% cases, respectively. The median CAP values of patients with mild, moderate and severe steatosis were 260 db/m, 287.5 db/m and 354 db/m. Clinically relevant fibrosis was detected by means of TE in 19.6% (95/485) of subjects.

Conclusion: In our group, 59.3% of diabetic patients had severe steatosis by means of CAP, Regarding the liver fibrosis, we found that 19.6% of them had severe fibrosis (TE≥10.1kPa), suggesting the need for further assessment.
Objectives: The assessment of usefulness of ultrasound examination in the diagnosis of post-traumatic changes in the carotid and vertebral arteries.

Methods: In the period of 3 years (2016-2018), a group of 120 patients was sent to confirm / rule out post-traumatic changes in the carotid and vertebral arteries. All patients underwent ultrasound examinations of extracranial carotid and vertebral arteries using the B-mode option as well as color and spectral Doppler.

Results: In the ultrasound examination: 2 patients were diagnosed with internal carotid artery (ICA) pseudoaneurysm, 1 patient had an ICA thrombus, 2 patients had dissection of the vertebral artery, 1 patient had subclavian artery dissection, in 2 patients dissection of the common carotid artery was diagnosed, in 1 patient dissection of the brachiocephalic trunk and common carotid artery was observed. On the basis of ultrasound examination 2 patients with pseudoaneurysm and 2 patients with dissection were qualified for endovascular treatment.

Conclusion: Ultrasound examination is the method of choice in the diagnosis of post-traumatic changes in the extracranial segments of the carotid and vertebral arteries. It allows their unambiguous confirmation / exclusion and qualification of patients for endovascular treatment.
ULTRASOUND EVALUATION OF URINARY TRACT ABNORMALITIES IN CHILDREN.

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Objectives: To assess the capabilities of ultrasound examination in the diagnosis of urinary tract abnormalities in children.

Methods: A group of 66 children aged 2 months -18 years were enrolled into the study. Abdominal ultrasound examinations were performed with Philips Epiq and Toshiba Aplio 700 scanners using the 3.5 MHz and 5-12 MHz probes. All abdominal examinations were performed using the B-mode option. Various abnormalities of the urinary tract were found.

Results: In the group of 66 children in the ultrasound examination the following abnormalities were diagnosed: kidney agenesis in 2 children, renal hypoplasia in 4 children, polycystic dysplasia in 3 children, renal pelvic ectopy in 4 children, horseshoe kidney in 3 children, duplication of pelvicalyceal system without hydronephrosis in 15 children, duplication of pelvicalyceal system with enlargement of upper calyx in 6 children, unilateral ureterocele in 4 children, submucosal stenosis of the ureter in 5 children, stenosis of the ureter in 6 children. In addition, in 14 children, a different degree of widening of the pelvicalyceal system was found, suggesting the presence of vesicoureteral reflux. These patients were subjected to contrast enhanced urosonography or classical x-ray cystography confirming the presence of reflux in 8 children.

Conclusions: Ultrasound examination allows to identify urinary tract abnormalities in children and to qualify for further therapeutic or surgical treatment. Only in single defects other imaging modalities are necessary in order to achieve the final diagnosis.
USEFULNESS OF ENDOSCOPIC ULTRASOUND (EUS) AND COMPLICATION RATE IN A NEWLY ESTABLISHED TERTIARY CARE UNIVERSITY-AFFILIATED TEACHING HOSPITAL – A RETROSPECTIVE ANALYSIS OF THE LAST 4 YEARS

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AIM: to assess the usefulness of EUS and complication in a newly-established GI-center.

METHODS: Our retrospective study included 565 EUS performed in 470 patients between 2015-2018. EUS indications, complication rate and performance for different diagnosis were assessed.

RESULTS: Overall, interventional EUS rate was 37.1%. The number of EUS significantly increased in 2017-2018. The main 3 EUS indications changed over time (Table).

Overall, 23 complications in 22/565 (4%) EUS were reported: transient hypoxic respiratory failure: 1.4%, bleeding: 0.8%, pancreatitis: 0.5%, aspiration pneumonia: 0.3%, pancreatic drainage dislocation: 0.3%, pancreatic abscess: 0.1%, sepsis: 0.1% and thrombosis of superior mesenteric vein: 0.1%.

Choledocholithiasis was diagnosed in 36.4% of suspected cases. EUS showed a very good performance: 100% PPV, 97.6% NPV and 98.4% accuracy.

EUS could identify a cause of pancreatitis in 62.5% of cases with initially unknown etiology (45.8% biliary etiology, 8.2% pancreatic tumor and 4.5% pancreaticolithiasis and autoimmunpancreatitis).

EUS-FNA accuracy for solid pancreatic masse was 51.9%, with lowest value in 2016 (27.2%), and highest value in 2018 (79.3%).

Subepithelial tumors were confirmed by EUS in 64.4% of suspected cases. FNA was performed in 35.8% of cases. The rate of conclusive histology was low (20.7%).

An intervention was performed in 69.2% of all pancreatic cysts (53.8% FNA, 9.9% Pigtail drainage and 5.5% AXIOS® drainage).

CONCLUSION: EUS is increasingly used in our Center with a low rate of complications and excellent performance for detection of choledocholithiasis and provided an etiology in more than half of patients with unknown cause of acute pancreatitis.

Table. Number of investigations and EUS indications

<table>
<thead>
<tr>
<th></th>
<th>2015 (100 EUS)</th>
<th>2016 (73 EUS)</th>
<th>2017 (146 EUS)</th>
<th>2018 (246 EUS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr(%) interventional EUS</td>
<td>n=41(41%)</td>
<td>n=38(52%)</td>
<td>n=61(41.7%)</td>
<td>n=70(28.5%)</td>
</tr>
<tr>
<td>Endoscop: -radial -linear</td>
<td>n=0(0%)</td>
<td>n=0(0%)</td>
<td>n=59(40.4%)</td>
<td>n=136(55.3%)</td>
</tr>
<tr>
<td></td>
<td>n=100(100%)</td>
<td>n=73(100%)</td>
<td>n=87(59.6%)</td>
<td>n=110(44.7%)</td>
</tr>
</tbody>
</table>

Poster presentations
| Main indications | 1. Subepithelial tumors  
n=33(33%)  
2. Pancreatic cysts  
n=24(24%)  
3. Pancreatic masses  
n=22(22%) | 1. Subepithelial tumors  
n=27(36.9%)  
2. Pancreatic masses  
n=17(23.2%)  
3. Pancreatic cysts  
n=10(13.7%) | 1. Subepithelial tumors/Suspicion of choledocolithiasis  
n=35(23.9%)/n=35(23.9%)  
2. Pancreatic masses  
n=32(21.9%) | 1. Suspicion of choledocolithiasis  
n=92(37.4%)  
2. Pancreatic masses  
n=46(18.7%)  
3. Subepithelial tumors  
n=30(12.2%) |
THE ROLE OF ULTRASOUND AND CONTRAST-ENHANCED ULTRASOUND IN ASSESSMENT OF ACUTE PANCREATITIS IN A TERTIARY GASTROENTEROLOGY DEPARTMENT

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Introduction: Acute pancreatitis is an entity of notable importance due to its high incidence and mortality. Conventional ultrasound (US) is currently the first-line imaging modality used in clinical practice for assessing acute pancreatitis, as a non-invasive, easy and safe procedure.

The aim of the current retrospective study was to investigate the value of conventional ultrasonography and contrast-enhanced ultrasound (CEUS) in the assessment of acute pancreatitis, using contrast enhanced CT/MRI as the reference method.

Material and methods: We conducted a retrospective study of 187 patients with acute pancreatitis who were admitted in our Department from January 2017 to February 2019. US was performed in all patients and CEUS in a subgroup in whom the pancreas was visible by US. CEUS enhancement pattern of the lesions was described according to the current EFSUMB guidelines. All patients had CT/MRI as reference method.

Results: 187 patients were included (117 men-62.6%; mean age 56.1 years; range 19-90) from which 47 were with recurrent pancreatitis. In most cases the etiology was biliary 43.3% (81), followed by alcohol abuse 26.2% (49) and hypertriglyceridemia in 7.5% (14) patients, while in 13.4% (25) of cases the cause of acute pancreatitis was unknown. From the study group 64 (35.1%) were mild, 96 (51.3%) moderate and 22 (11.7%) severe forms of acute pancreatitis. US diagnosed free intraperitoneal fluid and collections in 84.7% (n=100) cases. CEUS was performed in 23 cases (19.4%) and pancreatic necrosis was diagnosed in 8 patients. CEUS missed the presence of necrosis only in 1 patient as compared to CT/MRI.

Conclusion: Standard ultrasound is a good method for assessment in acute pancreatitis, with a good detection of free intraperitoneal fluid and collections, but with limited value to detect pancreatic necrosis. CEUS is comparable to CT/MRI for diagnosing pancreatic necrosis, but is limited by the acoustic window of the patient.

Keywords: acute pancreatitis, standard ultrasound, CEUS
FOCAL LESION IN CIRRHOTIC LIVER: AN INFREQUENT DIAGNOSIS.

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CLINICAL CASE
We report the case of a man with biannual ultrasonography follow-up due to ethanolic cirrhosis. He presents a hepatic lesion of 23x18 mm in s.VIII with hypoechoic halo and without doppler flow, and another hypoechoic lesion of 9 mm in s. IV. Contrast enhanced ultrasound study of the bigger lesion shows complete enhancement in arterial phase with reduction in enhancement (“wash out”) in early portal phase (CEUS LR-M). No other hypoechoic lesions were observed in late phase. An abdominal PET-CT and abdominal nuclear magnetic resonance found three hepatic lesions with non-specific behavior, without extrahepatic involvement. Because of chromogranin A positive in blood tests we made an octeotride scintigraphy, that showed three lesions in s. VIII and s.IV with high suspicion of metastatic neuroendocrine tumor (NET). The diagnosis was confirmed with histological study of one lesion. The inicial treatment was surgical (hepatectomy) considering that only hepatic involvement was identified. After surgery we could identify the primary tumor in the distal ileum thanks to a new PET-CT.

DISCUSSION
Before any hepatic lesion in a patient with cirrhosis we must be rule out hepatocellular carcinoma, but it is not the only neoplasia that we can find. Contrast enhanced ultrasound study allows for defining patterns depending on the tumor. Usually, malignant tumors have variable pattern in the arterial phase, but the wash out phenomenon in late phase characterizes malignancy. The onset of this phenomenon is later in hepatocarcinoma, compared to metastasis, colangiocarcinoma, lymphoma or neuroendocrine tumor. NETs, which are defined as epithelial neoplasms with predominant neuroendocrine differentiation, arise throughout the body and can present in the pancreas or the tubular gastrointestinal tract (appendix, rectum, distal ileum). Metastasis are the most common type of liver disease in NETs, and they can appear as carcinoid síndrome. Primary hepatic neuroendocrine tumor are extremely rare.
Figure 1. Abdominal ultrasound: hepatic lesion with hypoechoic halo.

Figure 2. Contrast enhanced ultrasound study: arterial phase.

Figure 3. Contrast enhanced ultrasound study: portal phase. “Wash out” phenomenon.
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GASTROINTESTINAL ULTRASOUND TO SEPARATE REMISSION FROM ACTIVE CROHN’S DISEASE

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Objectives: Patients with Crohn’s disease require medical treatment over longer time periods. It is important to separate patients with active disease from patients in remission to enable treatment adjustment. Ileocolonoscopy is the reference standard for disease activity in Crohn’s disease limited to the colon and terminal ileum. This is an invasive and resource intensive examination limiting frequent use. To evaluate the patient the clinician, therefore, often uses a combination of patient reported information, clinical examination, biochemical tests and cross-sectional imaging. Gastrointestinal ultrasound (GIUS) is a sensitive method for detecting inflammatory bowel disease, and we aimed to investigate whether it can be used to separate patients in endoscopic remission from patients with active disease.

Methods: 59 patients were included prospectively. They were scheduled for ileocolonoscopy as follow up of Crohn’s disease. All patients were scored with the “Simple endoscopic score of Crohn’s disease” (SES-CD). We used a strict definition of endoscopic remission: SES-CD=0. All patients were examined with GIUS by an investigator blinded to the endoscopic findings. Ultrasound remission was defined as wall thickness <3mm (<4 mm in the rectum). SES-CD was also compared to the clinical score “Harvey Bradshaw’s index” (HBI, remission <4 points), calprotectin (remission <50mg/kg) and C-reactive protein (CRP, remission <5mg/L).

Results: There were 45 patients with active disease and 14 patients in endoscopic remission. GIUS had a sensitivity of 95.6% and a specificity of 78.5% for detecting active disease and an accuracy of 91.5%. For HBI sensitivity was 57.8% and specificity 85.7%, calprotectin had sensitivity 64.5% and specificity 90.0%, and CRP sensitivity 48.8% and specificity 92.9%.

Conclusions: GIUS has very high sensitivity for detecting disease activity, but in our study, some false positive examinations gave a lower specificity. For patients with suspected disease of the colon on GIUS a secondary test using calprotectin may improve specificity.
2D-SHEAR WAVE ELASTOGRAPHY WITH ESAOTE (QELAXTO) COMPARED TO 2D-SHEAR WAVE ELASTOGRAPHY WITH AIXPLORER SUPersonic IMAGINE (SSI) FOR THE ASSESSMENT OF LIVER STIFFNESS IN PATIENTS WITH LIVER DISEASES

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**Objectives:** To date no study has ever explored the potential role of a new 2-dimensional Shear Wave Elastography (2D-SWE) technique that has been recently implemented on Esaote MyLab Nine devices. The aim of our study was to evaluate the agreement between 2D-SWE with Esaote MyLab Nine (QElaXto) and 2D-SWE with Aixplorer Supersonic Imagine (SSI) as the reference standard.

**Methods:** Data was collected prospectively from November 2018 to February 2019 on patients who were scheduled to undergo liver elastography as requested by our Hepatology Unit. Exclusion criteria were HCC/malignant liver nodules, severe extra-hepatic comorbidities and liver stiffness (LS) >50 kPa. LS was sampled from the same intercostal space with both QElaXto and SSI when possible. Values were tested with correlation coefficient analysis and Bland–Altman analysis (B&A); agreement between the two elastography techniques was assessed with Spearman correlation.

**Results:** The study included 130 patients (42[32%] HCV and 26[20%] NAFLD; 96% Child-Pugh A). Failure of LS measurements occurred in only one patient for both elastography techniques (BMI >40) and another patient was excluded from the analysis because of LS >50 kPa. Correlation coefficient was very good at 0.951; B&A analysis showed a mean of 1.4 kPa, with limits of agreement at -1.5 and 4.3 kPa. Spearman’s rho correlation of SSI versus QElaXto was 0.885. The relationship became less strong in the higher range of LS (≥14 kPa), corresponding to patients with liver cirrhosis.

**Conclusions:** There is an overall excellent degree of concordance of QElaXto as compared to the “reference standard” SSI, with the first method showing lower LS results as compared to the latter. Further studies are warranted in order to validate this new technique in comparison or in combination with other non-invasive methodologies and liver biopsy.
HOW ENDOSCOPIC ULTRASOUND (EUS) WAS DECISIVE TO ESTABLISH THE CORRECT DIAGNOSIS OF PATIENTS – A CASE SERIES

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AIM: To present how EUS was decisive to establish the correct diagnosis in a series of patients.

METHODS: Cases, where EUS establish the correct diagnosis despite inconclusive radiologic evaluation, were identified in our EUS database. RESULTS: Case 1-74 year old female patient, hospitalized due to acute pancreatitis of unknown etiology. CT Scan showed a normal pancreas. EUS excluded a biliary etiology, but a 1.7x1.5 cm hypoechoic mass in the head of the pancreas was identified. MRI performed could not clearly detect the lesion. EUS-FNA showed atypical cells with high grade dysplasia. Surgery was performed and histology showed pancreatic adenocarcinoma.

Case 2-50 year old male patient, hospitalized because of deep vein thrombosis and pulmonary embolism. The patient had cachexia, mild ascites, and chronic alcohol consumption. The patient had no abdominal pain, lipase was normal and malignancy was suspected. CT Scan raised the suspicion of a liver metastasis and a suspect pancreatic lesion. MRI showed no evidence of a liver or solid pancreatic mass, only a pancreatic cyst. Diagnostic paracentesis did not detect tumor cells. EUS showed a 2.2x1.8 cm cystic lesion in pancreas with a 8 mm solid content. Fluid analysis obtained was typical for a pseudocyst. Paracentesis was again performed and showed increased lipase content. Secretin MRI was performed for suspicion of pancreatic duct fistula. This was confirmed and successfully treated by ERCP.

Case 3-56 year old female patient with known autoimmune thyroiditis hospitalized because of abdominal pain, weight loss and slightly increased lipase values. MRI raised the suspicion of a pancreatic mass and enlarged lymph nodes. EUS suspected an autoimmune pancreatitis. Fibrotic changes with lymphocyte infiltrate were presented in the histology obtained through EUS-FNA (IgG4 not elevated). Therapy with steroids was started and after 3 months MRI was normal and the patient was free of symptoms.

CONCLUSION: EUS is a useful technique in clinical practice to establish a correct diagnosis in cases where radiology is inconclusive.
THE EFFICACY OF THE ULTRASOUND EXAMINATION IN THE ASSESSMENT OF ILIAC VEIN THROMBOSIS.

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¹Medical University of Lublin, Lublin, Poland

Objectives: The aim of this study is to assess the diagnostic efficacy of the ultrasound examination in the diagnosis of iliac vein thrombosis.

Methods: During the 3-year period, a group of 160 patients with suspected iliac venous thrombosis was referred for ultrasound examination. Iliac veins were assessed in fastened patients, using a dosed compression procedure (study I). In cases when the iliac veins were completely or partially obscured, the examination was repeated within 1-3 days after adequate preparation (study II). All examinations were performed with GE LOGIQ 7 using B-presentation, Doppler and B-flow options.

Results: In the 68% of patients, the 1st ultrasound examination allowed for unambiguous evaluation of the iliac vein patency. Were diagnosed: total iliac vein thrombosis on the entire course in 6 patients, segmental iliac thrombosis in 3 patients, parietal thrombus in 7 patients, balloting thrombus in 4 patients. In the rest of the group, the iliac veins were correctly patent.

Remaining 32% of patients which has iliac veins completely or partially veiled, had the study repeated. The second ultrasound examination diagnosed 2 patients with a complete iliac vein thrombosis, 3 patients with a segmental iliac vein thrombosis, parietal thrombi in 5 patients and 2 patients with balloting thrombus. In 10% of patients, repeated ultrasound examination still did not allow for a clear diagnosis. On the basis of the ultrasound examination, 11 patients were qualified for implantation of the inferior vena cava filter.

Conclusions: Ultrasound examination of the iliac veins in 1/3 of cases does not allow for a clear diagnosis. Repeated examination after proper preparation significantly increases the effectiveness of ultrasound examination in iliac vein imaging. The ultrasound examination allows the imaging of total and segmental thrombosis as well as wall and pelvic thrombosis in the iliac veins and qualification of patients for filters implantation.
EARLY DETECTION OF CARDIOMYOPATHY IN PATIENTS WITH LIVER CIRRHOSIS USING MYOCARDIAL STRAIN IMAGING AND ITS CORRELATION TO LIVER STIFFNESS AND SEVERITY OF LIVER DISEASE – A PILOT STUDY

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BACKGROUND AND AIM:
The prevalence of cardiomyopathy in cirrhotics remains unknown because of its latent nature, characterized by blunted contractile responsiveness to stress, altered diastolic relaxation, and electrophysiological abnormalities. Our aim was to detect early myocardial dysfunction using new echocardiography technologies in cirrhotic patients and correlating them to liver stiffness (LS) and severity of liver disease.

METHODS:
Consecutive patients with liver cirrhosis without structural heart disease and portal vein thrombosis were included. Conventional and speckle-tracking echocardiography (Vendor GE, EchoPAC PC software) were performed by a single investigator (EACVI TTE certified). Subclinical myocardial dysfunction of left ventricle was defined as average global longitudinal strain (GLS) < -18 % (Lang RM, et al. J Am Soc Echocardiogr 2015;28:1-39).

LS was assessed by transient elastography (TE, Fibroscan®, Echosens) and share wave elastography (SWE) from Hitachi (Arietta V70). Reliable results were defined as median value of 10 valid measurements with an IQR/Med < 30 % and expressed in kPa. The presence of ascites, esophageal varices, splenomegaly and/or thrombocytopenia were considered as sign of portal hypertension.

RESULTS:
We evaluated 48 patients, but 8 did not fulfill the inclusion criteria (1 portal vein thrombosis, 2 coronary artery disease, 1 cor pulmonale and 4 patients with valvular dysfunction). The final analysis included 40 patients, with mean age of 58.7 ± 11.1 years (67.5% males). Compensated cirrhosis (Child-Pugh A) was present in 60% of patients, 22.5% were classified as Child-Pugh B and 17.5% as Child-Pugh C. LS could be evaluated in 77.5 % of cases by TE and in all patients by Hitachi SWE. Slightly reduced left ventricular ejection fraction (EF) was observed in 10% of patients. Diastolic dysfunction was present in 40 % of cases. Subclinical systolic dysfunction as assessed by GLS was present in 22.5 % of cases. The presence of systolic dysfunction tends to correlate with LS (Table).

CONCLUSION:
Clinical or subclinical left ventricular dysfunction was identified in a quarter of cirrhotic patients and this seems to correlate with LS, but not with the severity of liver cirrhosis.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>GLS &lt; -18% or reduced EF (n=10)</th>
<th>GLS ≥ -18% and normal EF (n=30)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS by TE (kPa)</td>
<td>41.3±25.1</td>
<td>29.1±17.6</td>
<td>0.09</td>
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<tr>
<td>LS by SWE (Hitachi)(kPa)</td>
<td>10.8±3.8</td>
<td>14.6±6.3</td>
<td>0.006</td>
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<tr>
<td>MELD</td>
<td>9.9±3.8</td>
<td>10.8±4.7</td>
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<td>Child-Pugh:</td>
<td></td>
<td></td>
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<tr>
<td>- compensated (A)</td>
<td>7 (70%)</td>
<td>18 (60%)</td>
<td>0.85</td>
</tr>
<tr>
<td>- decompensated (B+C)</td>
<td>3 (30%)</td>
<td>12 (40%)</td>
<td>0.85</td>
</tr>
<tr>
<td>Portal vein velocity (cm/s)</td>
<td>17.1±3.9</td>
<td>15.9±2.9</td>
<td>0.23</td>
</tr>
<tr>
<td>Signs of portal hypertension</td>
<td>6 (60%)</td>
<td>23 (57.5%)</td>
<td>0.81</td>
</tr>
<tr>
<td>Etiology:</td>
<td></td>
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<tr>
<td>- alcoholic</td>
<td>5 (50%)</td>
<td>19 (63.3%)</td>
<td>0.71</td>
</tr>
<tr>
<td>- other etiologies</td>
<td>5 (50%)</td>
<td>11 (36.7%)</td>
<td>0.71</td>
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<tr>
<td>Age (years)</td>
<td>61.5±12.2</td>
<td>58.8±10.6</td>
<td>0.54</td>
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<td>Gender:</td>
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<td></td>
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<tr>
<td>- male</td>
<td>5 (50%)</td>
<td>22 (73.3%)</td>
<td>0.33</td>
</tr>
<tr>
<td>- female</td>
<td>5 (50%)</td>
<td>8 (26.7%)</td>
<td>0.33</td>
</tr>
</tbody>
</table>
PRACTICAL EXPERIENCES OF USING SHEAR WAVE ELASTOGRAPHY FOR EVALUATION OF THE DEEP VENOUS THROMBOSIS.

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Objectives
The aims and objectives of our study were to explore the possibility of using shear wave elastography like additional method for evaluation of the deep venous thrombosis and distinguish between acute and chronic clots by characterizing tissue stiffness.

Materials and methods
Ultrasound and shear wave images were obtained from 72 adults (aged 43.8±5.1) who underwent medical check-up in our hospital. Subjects consisted of 34 patients with clinical and ultrasound findings of acute deep venous thrombosis of lower extremities (proximal and distal levels of femoral vein), and 38 patients with clinical and ultrasound findings of chronic deep venous thrombosis. The diagnosis of deep venous thrombosis was based on clinical and ultrasound findings, which were obtained during venous duplex ultrasonography, combining color flow Doppler imaging with compression ultrasonography according to American College of Radiology (ACR) guidelines and technical standards. An Aplio 500 ultrasound machine (Toshiba Medical Systems, Co., Ltd., Otawara, Japan) with linear 4.8 - 11 MHz transducers and elastography software was used. The examinations were performed according to the EFSUMB Guidelines and recommendations on the clinical use of ultrasound elastography.

Results
Ultrasound findings of acute (no longer than 2 days after the beginning of clinical manifestations) venous thrombosis such as hypoechoic, homogeneous, structure on B-mode, vein dilatation, incompressibility of the vein during the ultrasound test were correlated with elasticity values 9±1.4 kPa (p≤0.01).

Ultrasound findings of chronic venous thrombosis, such as heterogeneous structure on B-mode with hyperechoic component, incompressibility of the vein during the ultrasound test were highly correlated with higher elasticity values 28±1.03 kPa (p≤0.01).

Conclusions
The choice of the treatment for deep venous thrombosis depends of the age of the clot. Shear wave elastography seems to be useful non-invasive additional method for age differentiation of clots by characterizing clot stiffness. Age differentiation of the deep venous trombosis could also be useful in diagnosing re-thrombosis of a previously thrombosed vein and create more effective and clinically relevant treatment protocols based on this findings.
ATYPICAL MALAR MASS: PLEOMORPHIC ADENOMA IN ACCESSORY PAROTID LOBE

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OBJECTIVE: To describe Ultrasonography (US) and Color Doppler Ultrasound findings of pleomorphic adenoma of accessory parotid gland located in the malar region with histopathological correlation.

MATERIAL-METHOD: A 76 year old male patient with complaint of painless swelling in the left malar region was referred to our Ultrasound department for mass characterization by general surgery department.

RESULTS: US and Color Doppler US examination were performed. There was an 36.5x14.5 mm size accessory gland continuing with the superficial lobe of the left parotid gland. A 25.5x14 mm sized uniformly contoured, heterogeneous hypoechoic intraglandular solid lesion with poor posterior acoustic strengthening and internal-peripheral arterial vascularisation in Color Doppler US in the accessory lobe. The mass was primarily considered as a pleomorphic adenoma of the accessory parotid gland according to the US and color Doppler US findings. Histopathological correlation was recommended. Total excisional biopsy of the mass was reported as pleomorphic adenoma of the accessory gland.

CONCLUSION: The parotid gland is the largest salivary gland. The small portion of the parotid gland under the arcus zygomaticus is usually located separately from the gland, and this is called as accessory parotid gland. Although the frequency of this variation is 21-61% in autopsy series, the pathologies of this structure are rare. Accessory parotid gland is hypertrophic in some cases and can be palpated during physical examination. In this case, the malar mass may not be distinguished. For appropriate diagnosis and treatment; it is very important to keep in mind this variation and associated pathologies of accessory parotid gland that is located in the malar region.

Keywords: Accessory parotid gland, malar mass, pleomorphic adenoma, Ultrasound, Colour Doppler Ultrasound, Histopathology
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ABVS AND HHUS -IN BREAST LESIONS- OUR INITIAL EXPERIENCE

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The aim of this study is to report our initial experience in detecting breast lesion, by using automated breast volume scanner – ABVS

METHODS
From January 2017 to February 2019, bilateral whole breast examination were performed in 947 patients. They were underwent both HHUS and ABVS method.
Two independent radiologist evaluated the sonographic features of each lesion according to BIRADS categorization.
In period of last two years all patients, were detected by using ABVS
It was found 692 benign lesions, BIRADS 2,3 and 117 malignant lesions BIRADS 4,5
Ultrasound has not found 25 malignant lesions and has found 12 new lesions
At lesions BIRADS 4,5 are made FNCB, and histological lesions are CONFIRMED

CONCLUSIONS
In our modest experience, we conclude that ABVS had high diagnostic accuracy, multi-slice visualization, of whole breast and that is very useful modality in fibro-glandular breast. There are not significantly different from HHUS, but it’s very important to use additionally both methods.
LONG-TERM CLINICAL AND ULTRASOUND ANALYSIS OF GALLBLADDER POLYPS

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Objectives
The aim of our study was to determine the natural history of gallbladder polyps (GBP) incidentally detected at abdominal ultrasound (US) and evaluate the impact of epidemiological features and traditional risk factors of malignancy in GBP behavior and growth rate.

Methods
A database search for “GBP” in US between January 2013 and December 2018 was performed and subsequent US reports were reviewed. Epidemiological characteristics, risk factors, number and GBP size were retrospectively recorded. Significant Growth Rate (SGR) was defined as an increase in size ≥2 mm.

Results
257 patients with GBP were included. The mean age was 54 years (41-63). There was 128 men (50.2%). Only 37 cases (14%) had gallstones or sludge at the time of diagnosis. Single polyps were seen in 136 patients (53%). Polyp size ranged from 2 to 20 mm (mean size of 4.5 mm) and in latest follow-up US kept stable in 114 (45%), decreased in 34 (13%), increased in 95 (37%) and resolved in 13 (5%). 24 patients (9%) had SGR and there was no differences in age, sex, presence of cholelithiasis, number of GBP, size and cholecystectomy compared with patients without SGR (p>0.05). 24 (9%) patients underwent cholecystectomy; 10 patients (42%) owing to GBP size at US; the remainder, for biliar colic (12/24; 50%) and previous acute pancreatitis (2/24;8%). Histology revealed 12 (50%) cases with cholesterol polyps, 6 (25%) with cholelitiasis and only 1 patient with adenoma (4%).

Conclusions
GBP can be safely followed up and we did not observe any gallbladder cancer in our cohort.

Although more patients were detected with SGR (9% vs 6%), we did not found evidence of a growth rate ≥ 2 mm as a risk factor for malignancy, disaccording last guidelines.
VALUE OF CONTRAST-ENHANCED ULTRASOUND IN EVALUATING SYNOVIAL VASCULARITY AND PREDICTING RECURRENT JOINT BLEEDING OF PATIENTS WITH HEMOPHILIA

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¹Nan Fang Hospital, Southern Medical University, Guangzhou, China, ²Children Hospital of Eastern Ontario, Canada, ³The Second People’s Hospital of Shenzhen, Shenzhen, China

Background: Repeated joint bleed, target joint formation and development of hemophilic arthropathy can occur in patients with hemophilia despite clotting factor replacement. Synovial hypertrophy and neoangiogenesis of hemophilia arthritis may be one of the reasons for recurrent joint bleeding or breakthrough bleeding. Sensitive evaluation tools for synovial hypertrophy and neoangiogenesis are needed, which may help predict the possibility of recurrent joint bleeding, therefore improve clinical diagnosis and individualized treatment for hemophilia.

Objectives: To study the value of conventional ultrasound and contrast-enhanced ultrasound (CEUS) in evaluating joint diseases and the possibility of recurrent joint bleeding in severe hemophilia A patients.

Methods: 81 severe hemophilia A patients with medium-dose prophylactic therapy were enrolled. At baseline, conventional ultrasound and CEUS examinations were performed for patients eligible. According to clinically evident joint bleed or not during the follow-up period of 4 months, patients enrolled respectively into two groups including joint bleeding group and no joint bleeding group.

Results: Compared with CDFI, more joints showed blood flow signal on CEUS mode. Besides, grades of synovial angiogenesis on CEUS mode were significantly higher than on CDFI mode (Z=-3.781, P< 0.001). The baseline ultrasound scores (except cartilage destruction and bone destruction scores) of the joint bleeding group were significantly higher than that of no joint bleeding group (P< 0.05). Joint bleeding frequency were positively correlated with ultrasound scores (except cartilage destruction and bone destruction scores) at baseline, and with the highest correlation with CEUS score (r=0.648, P< 0.05).

Conclusions: Conventional ultrasound and CEUS are essential for evaluating hemophilia joint diseases and the possibility of recurrent joint bleeding; moreover, CEUS can more accurately assess the degree of synovial hyperplasia and synovial angiogenesis than conventional ultrasound. Therefore, CEUS may be valuable in predicting the recurrence of joint bleeding and provide more reliable evidence for individualized treatment.
VALUE OF ULTRASOUND IN HEMOPHILIA JOINT STRUCTURE COMPARED WITH MAGNETIC RESONANCE IMAGING

Dr. Fei Ma1, Dr. Yingjia Li1, Dr. Jing Sun1, Dr. Yaru Zhang1, Dr. Hao Liu1, Dr. Shiyu Zhang1, Dr. Liling Xiao2, Dr. Wanxian Luo1, Dr. Li Zhang4, Dr. Weizhen Wang1, Dr. Shiqiu Qiu1

1Nan Fang Hospital, Southern Medical University, Guangzhou, China, 2The Second People’s Hospital of Shenzhen, Shenzhen, China

Background: To find a convenient evaluation tool for hemophilia arthritis.

Objectives: Referring to MRI on the diagnosis of hemophilic arthropathy, to explore the diagnostic value of ultrasound on hemophilic arthropathy.

Methods: The ultrasound and MRI examinations were performed on 42 joints of 42 hemophilia patients (14 knees, 14 ankles and 14 elbows). The consistency of ultrasound and magnetic resonance imaging in the detection and score of joint diseases was compared. Finally, inter-and intra-observer agreements of ultrasound scoring system were tested.

Results: The consistency of ultrasound and magnetic resonance imaging was excellent ($\kappa=0.763-0.896$, $P<0.001$) in the detection of early soft tissue lesions (effusion or hemarthrosis, synovial hypertrophy, hemosiderin), excellent ($\kappa=0.793$, $P<0.001$) in the detection of cartilage loss, poor ($\kappa=0.133$, $P=0.132$) in the detection of erosions and poor ($\kappa=0.100$, $P=0.137$) in the detection of subchondral cysts. The consistency of ultrasound and magnetic resonance imaging was good to excellent ($\kappa=0.684-0.833$, $P<0.001$) in the score of early soft tissue lesions (effusion or hemarthrosis, synovial hypertrophy and hemosiderin) and poor to good ($\kappa=0.145-0.635$, $P<0.001$) in the score of advanced osteochondral lesions (cartilage loss and bone erosions). The inter-observer agreement was good to excellent ($\kappa=0.676-0.870$, $P<0.001$) for early soft tissue lesions and moderate to excellent ($\kappa=0.421-0.751$, $P<0.001$) for advanced osteochondral lesions. The intra-observer agreement was good to excellent ($\kappa=0.705-0.885$, $P<0.001$) for early soft tissue lesions and moderate to good ($\kappa=0.532-0.732$, $P<0.001$) for advanced osteochondral lesions.

Conclusions: Ultrasound plays an important role in detecting early soft tissue changes (effusion or hemarthrosis, synovial hypertrophy, hemosiderin) and cartilage loss, which helps follow-up and guide clinical treatment.
PREVALENCE STUDY OF NONALCOHOLIC FATTY LIVER DISEASE IN INFLAMMATORY BOWEL DISEASES: A COHORT STUDY USING TRANSIENT ELASTOGRAPHY AND CONTROLLED ATTENUATION PARAMETER


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Background: Inflammatory bowel disease (IBD) patients may be at risk for nonalcoholic fatty liver disease (NAFLD) due to the use of hepatotoxic drugs and chronic inflammation. Liver biopsy remains the gold standard for diagnosing NAFLD, but its use is limited by invasiveness. Controlled attenuation parameter (CAP) performed by transient elastography (TE) is a noninvasive diagnostic tool providing us an assessment of liver steatosis.

Objectives: Our aim was to evaluate the presence of NAFLD in IBD patients and to identify predictors for NAFLD in this population.

Methods: Adult patients diagnosed with IBD who came to our practice were randomly selected and prospectively evaluated. Patients with preexisting liver disease or hazardous alcohol intake (estimated by an Alcohol Use Disorders Identification Test (AUDIT-C) >5) were excluded. TE with CAP and liver stiffness measurement (LSM) was performed to each participant. NAFLD was defined by CAP >248 dB/m. Significant liver fibrosis was defined by LSM >7.1 Kpa. Data were analyzed by univariate and multivariate analysis.

Results: Eighty-two patients with IBD were evaluated. Prevalence of NAFLD was 45% with significant fibrosis in 18%. Patients with steatosis were older (OR 1.056; 95%CI 1.017-1.102), weighed more (OR 1.087; 95%CI 1.044-1.139), had a higher BMI (OR 1.268; 95%CI 1.125-1.461), abdominal circumference (OR 1.107; 95%CI 1.059-1.166) and Fatty Liver Index punctuation (OR 1.035; 95%CI 1.019-1.054). Additionally, the use of infliximab was more frequent (OR 3.304; 95%CI 1.194-9.871) than in those patients without steatosis. In the multivariate analysis, a greater weight and infliximab use were independently associated with steatosis (p<0.05).

Conclusion: Our results suggest a higher prevalence of NAFLD in IBD patients than in general population. Besides the usual predictors of liver steatosis found in general population, infliximab use was also independently associated with this entity in patients with IBD.
CONCURRENT HEPATIC AND RENAL ANGIOMYOLIPOMAS IN TUBEROUS SCLEROSIS COMPLEX

Dr. Beatriz Burgueño Gómez¹, Dr. Mayra Lindo Ricce², Dr. Concepción González Frutos²
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Tuberous sclerosis complex (TSC) is a rare autosomal dominant disease which is characterized by widespread of a variety of benign tumors in multiple organs (brain, heart, skin, kidney, etc.). Renal angiomyolipomas (AMLs) are the primary cause of morbidity and mortality in TSC due to anemia, renal failure or spontaneous bleeding. In contrast, the hepatic involvement is unusual and it is infrequently described in literature.

We present the case of a 57-year-old female affected by TSC with end-stage renal disease due to renal AMLs (she has a dysfunctional previous kidney transplantation and a left kidney embolization secondary to severe hematuria). As a complication after dialysis catheter placement she presented a superior vena cava and azygos vein thrombosis; developing proximal esophageal variceal bleeding. She was referred for abdominal ultrasound examination pre kidney transplant assessment in order to rule out chronic liver disease. The sonographic study showed multiple various size (<10 mm) well defined hyperechoic nodules in the liver. CEUS examination revealed isoenhancement in all phases. We also find homogenous hepatic parenchyma with normal echogenicity and normal portal vein diameter, splenorenal collaterals and splenomegaly (presented for at least 25 years), without ascites, right nephrectomy and left renal atrophy. Ultrasound elastopgraphy revealed a normal liver stiffness. The liver function was normal.

AMLs of the liver is the less common location in TSC (6–10% of cases). Hepatic AMLs are usually asymptomatic and non-progressive lesions. However, patients with large lesions (>4 cm) have some symptoms due to compression, but there is not any case reported about chronic liver disease due to hepatic AMLs in TSC, like our patient. In our case, splenic collaterals are explained by azygous vein thrombosis. Splenomegaly is not explained by portal hypertension because it has already been present for years and she has not had other signs of portal hypertension or cirrhosis.
Poster presentations
ANGIOSARCOMA CARDIAC DIAGNOSED BY PAAF OF HEPATIC METASTASIS

Dr. Javier Lucas Ramos\textsuperscript{1}, Dr Luis Blanco Santana\textsuperscript{1}, Dr Joaquin Poza Cordón\textsuperscript{1}, Dr Irene Andaluz Garcia\textsuperscript{1}, Dr. Jorge Yebra Carmona\textsuperscript{1}, Dr Eva Marín Serrano\textsuperscript{1}, Dr Antonio Olveira Martín, Dr. Pedro Mora Sanz\textsuperscript{1}
\textsuperscript{1}Hospital Universitario La Paz, Madrid, Spain

A 76-year-old patient who came to the Emergency Department with thoracic oppression and minimal effort dyspnea of three days of evolution. Physical examination reveals the appearance of edemas in the lower limbs and bibasal crackles of new appearance. The study is extended with echocardiogram observing a large mass dependent of the right atrium, with severe associated pericardial effusion. Evacuation pericardiocentesis is performed, with clinical improvement of the patient. The examination is completed with a CT scan and abdominal ultrasound showing a hypo-enhancement mass in segment VII of the liver. Histological study of cardiac mass was not available, so PAAF of hepatic mass perfomed, which reveals a cell proliferation of the spindle cell type, with positive immunohistochemical results for CD34 and CD31, with a diagnosis of cardiac angiosarcoma with hepatic metastasis. The patient is dismissed for surgery and chemotherapy is started with weekly paclitaxel.

Metastases are the most frequent neoplasms of the heart. Cardiac angiosarcomas are extremely rare diseases that are usually diagnosed late in their evolution because of their non specific symptomatology. The clinical symptoms are caused by several mechanisms, blood flow obstruction, local invasion causing pericardial effusion with tamponade, thromboembolism. Imaging procedures such as transesophageal echocardiography, magnetic resonance imaging are important for diagnosis. Histopathology with immunohistochemistry studies as well as cytogenetic analysis. Metastases are usually described from the onset of symptoms, with the lung being the most common organ. Despite the fact that surgery is the reference treatment, the majority of patients present unresectable tumors at the time of diagnosis. Given these disadvantages of surgery and the high risk of distant metastasis, adjuvant radiotherapy and systemic chemotherapy are proposed as treatment, even with unsatisfactory results.

Finally, it is important to highlight the importance of ultrasound and the extraction of samples for histological study in the diagnostic process of different tumors, as in our case, cardiac angiosarcoma.

Figures:
Figure 1. Histology and immunohistochemistry
The histological study of the hepatic lesion performed by PAAF reveals a cell proliferation of the spindle cell type, with positive immunohistochemical results for CD34 and CD31.

Figure 2. MRI and CT. Hypo-enhancement mass dependent of the right atrium, with severe associated pericardial effusion

Figure 3. Abdominal ultrasound showing a hyperecogenic mass in segment VII of the liver
ACCURACY AND CONSISTENCY OF CEUS LI-RADS IN DIAGNOSING FOCAL LIVER LESIONS

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Objectives
To evaluate the diagnostic accuracy and consistency between examiners of CEUS LI-RADS (contrast enhanced ultrasound Liver Imaging Reporting and Data System) compared with the traditional experience-based diagnosis method in diagnosing liver lesions.

Methods
Imaging and clinical data of 263 patients at risk for HCC who underwent CEUS were collected retrospectively. Two trained inexperienced radiologists and one experienced abdominal radiologist reviewed all CEUS clips. Each inexperienced radiologist provided CEUS LI-RADS category for each observation independently. The diagnostic accuracy of CEUS LI-RADS was evaluated by the receiver operating characteristic (ROC) curve, and the consistency between examiners was analyzed by Kappa test. All tests were considered significant at P < 0.05.

Results
Consistency test was performed on the grading results given by inexperienced radiologists using CEUS LI-RADS. Kappa=0.776 (P < 0.001) indicated that CEUS LI-RADS algorithm made preferable consistency between examiners. For the diagnosis of HCC (LR-5, LR-TIV), the sensitivity, specificity, positive predictive value and negative predictive value were 88.3 %, 97.1 %, 93.8 % and 94.4 %, respectively. The area under the ROC curve was 0.964 (P < 0.001).

Conclusions
CEUS LI-RADS algorithm can not only obtain good consistency among examiners, but also have high accuracy in differentiation of benign from malignant FLLs in patients at risk. It can be also used by radiologists who are not familiar with hepatic CEUS.
EVALUATION OF LIVER STIFFNESS IN TYPE 2 DIABETES MELLITUS AND NONALCOHOLIC FATTY LIVER DISEASE PATIENTS USING SHEAR WAVE ELASTOGRAPHY.

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Objectives. The aims and objectives of our study were to evaluate the liver stiffness in patients with type 2 diabetes mellitus and ultrasound proven steatosis using shear wave elastography.

Materials and methods. Ultrasound and shear wave images were obtained from 92 adults (aged 52.5±4.3) who underwent medical check-up in our hospital. Subjects consisted of 41 patients with ultrasound findings of liver steatosis, high total cholesterol and triglycerides levels (mmol/L), normal blood sugar level and 51 type 2 diabetic patients with ultrasound findings of liver steatosis and high total cholesterol and triglycerides levels. Multiple transverse and longitudinal grayscale and shear wave images of the liver were obtained by using Aplio 500 ultrasound machine (Toshiba Medical Systems, Co., Ltd., Otawara, Japan) and elastography software. The examinations were performed according to the EFSUMB Guidelines and recommendations on the clinical use of ultrasound elastography.

Results. In a group of patients with ultrasound proven steatosis and high total cholesterol and triglycerides levels elasticity values were 9.7±1.2 kPa (p≤0.05). In type 2 diabetic patients with ultrasound findings of liver steatosis and high total cholesterol and triglycerides levels elasticity values were 15.8±1.5 kPa (p≤0.05).

Conclusions. Shear wave elastography is a useful method for evaluation of liver stiffness in type 2 diabetic patients with high total cholesterol and triglycerides levels and liver steatosis. These findings could be useful for better understanding of the development of metabolic syndrome and create more effective and clinically relevant treatment.
DEVELOPMENT OF SIMULATION MATERIAL FOR ULTRASOUND-GUIDED INTERVENTIONAL PROCEDURES

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Introduction
Ultrasound is a safe and efficient way to obtain body images. One of the most recent applications for ultrasound is guidance of minimally invasive medical procedures. Ultrasound-guided percutaneous procedures are not easy to perform, therefore, a practice on phantoms with live tissue-like properties is crucial to provide safety during the real-life performance of procedures. Development of an appropriate cost-effective material for phantoms, which would closely simulate human body, may facilitate quicker and more productive sonography skill acquisition in novices.

Objectives
To develop a material simulating physical characteristics of human tissues as well as their sonographic properties.

Methods
The mechanical properties regarded include specific elasticity, viscoelasticity and frictional force during insertion of the needle as well as certain acoustic properties (ie, speed of sound, acoustic attenuation and acoustic impedance). According to a research performed, a combination of thermoplastic polymer, oil, mineral and incipient used in different proportions provide echogenicity and resistance to needle penetration similar to those of body tissues.

Results
The mixture of medical oil gel with propylene glycol, gelatinizer and polymetacrylate or methyl microspheres creates a material with the acoustic properties similar to those of human body tissue. The use of additional technology (3D printing) provides a development of highly realistic phantoms for the ultrasound training.

Conclusion
The material described corresponds to the current quality standards being less expensive than analogues.
HIDRADENITIS SUPPURATIVA: ULTRASOUND STUDY. ASSESSMENT, STAGING AND TREATMENT CONTROL

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We describe the main ultrasound findings of hidradenitis suppurativa (HS) and the usefulness of this technique in its diagnosis, management, staging and treatment control. With a prevalence of 1-4%, it is one of the dermatological diseases that affect the most the quality of life of patients suffering from it. It is a process with a great psychosocial impact for the patient due to the bad smell it causes and the consequent limitation of social and professional life. Ultrasonography has recently been introduced in the study and management of this pathology, and it has contributed to its knowledge because the depth of disease or degree of activity not always corresponds to the cutaneous manifestations.

We present our two year experience, since we began to evaluate these patients by ultrasound performed with a Toshiba Aplio 500. We describe the basic lesions of this process and its characteristics, describing imaging characteristics of this pathology. For two years, we studied 54 patients, with extensive and severe involvement, treated with Adalimumab®. We evaluated pre and post treatment control, assessing the inflammatory activity by color Doppler.

Ultrasound with high resolution transducers (18-22 MHz) is currently an essential instrument for the study and control of HS patients and a fundamental aid to the dermatologist. The diffusion of the knowledge of this exploration will contribute to the greater knowledge of this uncommon pathology. High resolution dermatological ultrasound is an essential tool for the control of the treatment of this pathology, especially since the introduction of new biological treatments.
PATELLAR TENDON STRAIN RATIO: AGING EVOLUTION IN SENIOR BADMINTON PLAYERS

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Objectives: The aim of the study was to describe the evolution of patellar tendon mechanical properties in badminton senior players who have more than 20 years of experience on badminton practice. Second was to differ between age-gender groups.

Methods: 110 male badminton players (51.8 ± 9.5 years, 179.3 ± 7.7 cm, 81.4 ± 12.6 kg, 10.5 ± 6.4 training-hours·sem\(^{-1}\)) and 96 female badminton players (53.4 ± 9.8 years, 165.8 ± 7.5 cm, 67.0 ± 9.4 kg, 6.0 ± 3.4 training-hours·sem\(^{-1}\)), voluntarily participated in a descriptive study. Each group was divided in 7 sub-groups by age: under 40 (U40), U45, U50, U55, U60, U65 and over 65 (O65). Dominant and non-dominant tendons strain ratio, which higher values indicate stiffer properties, were measured with a Logiq® S8 ultrasound. All data were taken at 1 cm down from patella insertion. Significance of differences between age-gender groups were calculated with two-ways ANOVA.

Results: Age-gender values showed higher strain ratio values in female groups (male vs female) in dominant lower limb strain ratio for U45 (1.38 ± 0.16 vs 1.96 ± 0.20 A.U.; \(p = 0.021\)) and U65 (1.08 ± 0.18 vs 1.88 ± 0.20 A.U.; \(p = 0.003\)); also strain ratio values were higher for female groups in non-dominant lower limb for U50 (1.05 ± 0.18 vs 1.59 ± 0.17 A.U.; \(p = 0.032\)) and U60 (1.34 ± 0.16 vs 1.84 ± 0.18 A.U.; \(p = 0.041\)). Differences between age group showed higher values in female non-dominant patellar tendon U45 than U55 (\(p = 0.012\)).

Conclusions: The differences between age-gender groups found in strain ratio values showed higher values in female’s sub-groups than male’s sub-groups. These results indicate that strain ratio can differentiate between age-gender group and could help us to establish longitudinal evolution of patellar tendon mechanical properties in senior badminton players.
THE RESULTS OF VIRTUAL TOUCH QUANTIFICATION (VTQ) OF ARFI ELASTOGRAPHY AND FINE NEEDLE ASPIRATION (FNA) OF THYROID NODULES CLASSIFIED BY TIRADS

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Objective: The aim is to compare thyroid nodules ARFI elastography data with TIRADS classification, which will allow to reduce the number of unjustified FNA and surgery.

Methods: 273 pathologically proved thyroid nodules in 256 patients aged 18 to 72 (181 women and 75 men) were examined by ultrasound and VTQ of ARFI. 84 patients received FNA (9 patients with over 2cm TIRADS3 classification and others with TIRADS4&5). The nodules were grouped according to ACR TIRADS classification.

Results: ARFI of
164 TIRADS2 thyroid nodules were 2.67±0.21 m/sec
47 TIRADS3 - 3.41±0.93 m/sec
56 TIRADS4 - 4.68±1.34 m/sec
6 TIRADS5 - 4.84±1.77 m/sec

In TIRADS2 and TIRADS3 groups, the figures closest to the median values were obtained among the nodes of 1-2 cm. However, the elastographic indices of stiffness of the nodules in the isthmus is significantly higher than those of the sonographically same type nodules located in the lateral lobes.

The presence of calcifications did not have a special effect on the stiffness of the nodules. In TIRADS4 and TIRADS5 nodules, the highest rigidity indicators were in solid forms. In 4 cases with proved papillary carcinoma which sonographically looked like diffused injury of one of lobes we received lower stiffness values (3.15-3.26 m/s).

In 11 observations of TIRADS4 with obtaining high ARFI stiffness of nodules, the cytology report corresponded benign nodules due to the presence of Hashimoto autoimmune thyroiditis.

Conclusion: ARFI elastography in combination with ultrasound examination provides high informativeness for nodules classified as TIRADS2 and TIRADS3 with the exception of nodes located in the isthmus. With solid malignant nodules, the informativeness of ARFI elastography is high. In cases with diffuse malignant affections and the presence of Hashimoto VTQ of ARFI elastography is less informative due to deceptive high or low data, and FNA comes to the fore.
THE ROLE OF THE ULTRASOUND DIAGNOSIS IN THE IDENTIFICATION OF ROTATOR CUFF TEARS

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Objectives: To determine the role of ultrasound in the diagnosis of shoulder rotator cuff injuries, to identify the concept of effectiveness and reveal the misdiagnosis of pathology.

Methods: We assessed 81 patients aged 34 - 80 (30women, 51men) with suspicious rotator cuff injury. All patients underwent clinical and ultrasound examination, X-ray. 34 patients received MRI for clarification of operating volume. 75 with rotator cuff injuries were operated (6 patients haven’t got tears).

Results:
51(63%) patients had full thickness tear of rotator cuff:
- 25(49 %) supraspinatus
- 16(31,4%) infraspinatus
- 3(5,9%) suprasinatus, infraspinatus and subscapular,
- 7(13,7%) suprasinatus, infraspinatus and subscapularis and biceps tendon dislocation.

From 51 patients 23 received MRI and for 19 patients we had coincidence of US and MRI results. 3 patients had partial tear of infraspinatus on MRI but US didn’t diagnose this and 1 patient had infraspinatus tendon tear on US, on MRI the tendon was normal. We analyze, that non-coincidence of US and MRI was connected with severe subacromial bursitis and lack of visualization due it.

24(29,6%) patients had partial tear of rotator cuff:
- 14(58,3%) articular sided
- 7(29,1%) bursal sided,
- 1- intersubstance.
- 2 - normal US

From 24 patients with partial tears, 11 received MRI and for 2 patients we had incoccidence of tear diameter on US and MRI, which was connected with limitations of US method and movement due to pain in the upper limb. 2 patients had partial tear of supraspinatus on MRI although on US the tendons were normal.

Conclusions: The ultrasonography proved to be a very informative method in the diagnostics of rotator cuff tears. Certain advantages of ultrasound: the speed, the ability to evaluate joint structures in dynamics, patient tolerance in comparison with MRI allows us to recommend it as a primary diagnostic method in detecting the presence and severity of the rotator cuff tears.
IMAGE-BASED DIAGNOSIS OF CUTANEOUS VASCULAR ANOMALIES IN CHILDREN. ROLE OF ULTRASOUND IN THE DIAGNOSIS AND CONTROL OF TREATMENT OF VASCULAR TUMOURS AND MALFORMATIONS

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Review the role of image-based diagnosis methods in the diagnosis, management and control of vascular lesions of the skin in children, mainly Doppler ultrasound (US).

According to the International Society for the Study of Vascular Anomalies (ISSVA), vascular abnormalities are divided into 2 large groups:

1. Vascular tumours:
2. Vascular malformations:

Despite the diagnosis is essentially clinical, Magnetic Resonance Imaging (MRI) and principally US let us make the initial evaluation as well as evolutionary control and monitoring of therapies.

Over the last 2 years, we studied 120 children with cutaneous vascular alterations, referred from Dermatology for the first diagnosis, or for evolutionary and therapeutical control. Some of them were previously studied with MRI due to suspect of in-depth extension.

We describe the main morphological findings in ultrasound in mode B, and the main features in color Doppler ultrasound and spectral Doppler ultrasound that allow to differentiate the different cutaneous vascular lesions.

In 21 cases already diagnosed clinically or with MRI, US changed the diagnosis.

In our experience, and excepting those cases where we have to study in-depth extension of vascular anomalies, US has become the test which provides more and better information to assess this kind of skin lesions. Thanks to it, we can diagnose properly, in a lot of cases, every sort of vascular lesion, with the consequent effect on the later management, helping dermatologists with the choice of the most adequate treatment.
OBJECTIVES:
Several studies showed that elastography can bring additional information regarding the stiffness of focal liver lesion, in order to predict their nature. However, there is a great amount of heterogeneity shown in the studies published to date.
This study aimed to evaluate the factors that influence intratumoral elastographic variability.

METHODS:
This prospective study included 106 patients, presenting to our tertiary department with focal liver lesions (FLLs) diagnosed on conventional ultrasound: 60 men (56.6%) and 46 women (43.4%), mean age 64.3± 12.3 years. A total of 116 FLLs were examined. The final FLL diagnosis was established by an imaging method (contrast enhanced CT or MRI) or biopsy.
Elastographic measurements (EM) were obtained in 116 FLLs using VTQ (Siemens). We performed 10 EM in the liver parenchyma and 10 EM in each focal liver lesion. Medians and interquartile ranges (IQRs) were calculated (m/s). We used the interclass correlation coefficient (ICC) with 95%b lower and upper limits of agreement (LOA) to assess the intraobserver reproducibility of VTQ. We analyzed the correlation between intratinal elastographic variability and tumor size, depth, tumor heterogeneity.

RESULTS:
A total of 116 lesions were evaluated. The lesions were: 88/116(75.9%) hepatocellular carcinomas, 11/116(9.5%) hemangiomas, 12/116(10.3%) metastases, 3/116(2.6%) focal nodular hyperplasia and 2/116(1.7%) adenoma. The total mean values obtained were: 2.2 m/s in HCCs, 1.9 m/s in hemangiomas, 2.9 m/s in metastases, 2.4 m/s in FNH and 2.35 m/s in adenoma. We did not find significant differences between the first five and the last five EM, the intraobserver reproducibility was excellent ICC: 0.902 (95% CI: 0.87-0.950). However, the tumor size, heterogeneity and depth correlated with higher variability in intratinal stiffness (p<.0001).

CONCLUSIONS:
Overall intraobserver reproducibility was excellent ICC: 0.902 (95% CI: 0.87-0.950).
Tumor size, depth and tumor heterogeneity correlated with higher intratinal stiffness variability (p<.0001)
The rotator cuff (RC) when intact acts to dynamically stabilize and balance the head of the humerus relative to the glenoid, so RC rupture can lead to loss of shoulder function. Rotator cuff injury (MRL) is the most common pathology of the shoulder. This study aims to evidence the incidence of MRLs diagnosed by ultrasonography (US) in 2017 at a reference clinic in Goiânia-Brazil. A total of 1330 shoulder US examinations were performed in both sexes, from 8 to 91 years. We exclude exams that did not include the analyzed side of the shoulder, leaving 1306 exams remaining. From these, the mean age and sex were analyzed, in addition to the prevalence of the diagnosis of MRLs. Within this diagnosis the laterality, affected structure and type of injury were analyzed. The mean age was 52.30. The diagnostic hypothesis of MRL was described in 212 reports, 150 right shoulder and 62 left shoulder, 68 men and 144 women. In 204 exams, the spinal structure was affected (132 transfixers and 46 non-transfixing - 3 bursals, 7 intratendinea and 36 deep border, others not described), in 18 the infra-spinal (10 were transfixing lesions and 2 non-transfixing deep borders, others not described) and in 11 the subscapular (7 transfixers and 1 non-transfixing deep border). No injuries were reported in the minor round. It is observed that 21 shoulders presented lesion in more than one structure. A prevalence of MRLs was observed in 16.2% of the ultrasound examinations of the shoulder, with a higher prevalence of supraspinatus tendon damage. We conclude that US has high accuracy in the diagnosis of MRLs. This work confirms the high incidence of MRLs in the US, with a mean age of 52.3 years, a higher prevalence in women and a greater supraspinatus involvement.
The study was proposed to observe the main diagnostic impressions of shoulder ultrasonography (US) in a specialized service in musculoskeletal US, in the year 2017, in the city of Goiânia, Brazil. The studied variables were: examination compatible with normality; subacromial space reduction; subdecotoid or subcoracoid subacromial bursitis; tendinopathy, with or without calcification of the tendons of the muscles rotator cuff (RC) and long head of the biceps (LHB). In addition to acromioclavicular osteoarthritis, LHB lesion, RC lesion, glenohumeral instability and glenoid effusion. It was also analyzed: age, sex and side. In 2017, 1050 patients performed shoulder US in this service (1346 shoulders examined). Of the 1050, the incidence was higher in women (71.7%), older than 50 years; the right side (RS) was the predominant one (58.62%), and the supraspinal tendon was the most affected of RC tendons with 58.58% of tendinopathies and 88.03% of RC ruptures. Followed by the infra-spinal tendon with 32.84% of tendinopathies and ruptures in 7.33%. There were 129 cases of calcifying tendinopathy (14.56%) of the 886 cases of RC tendinopathy, and also with a higher incidence in RS (60.5%). A total of 182 cases (13.52%) were considered normal. 38.57% of the exams had subacromial space reduction. 56.95% had bursitis, 0.84% were subcoracoid and 99.16% were subdelhotoid subacromial and 39.8% of bursitis were on the left side and 58.36% were on RS. LHB had a lesion in 38 (2.82%) of the total cases, split in 23 cases (60.52%) and 13 cases (34.21%) were total. 5.26% (2 cases) did not have the type described. 200 reports had LHB tendinopathy (14.86%), 34 of them (17.00%) were located in the proximal region of the tendon (rotator interval). It is concluded that this work can serve as a basis for other comparative studies of diagnostic imaging of the shoulder.
PREVALENCE OF MORTON NEUROMA DIAGNOSED BY ULTRASONOGRAPHY IN A REFERENCE CLINIC IN GOIÂNIA, BRAZIL IN THE YEAR 2017.

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Morton’s neuroma (MN) is a degenerative neuropathy caused by perineural fibrosis that develops a nodular lesion affecting the distal intermetatarsal region, corresponding to the bifurcation of the digital branches of the plantar cutaneous nerves and manifests itself as a form of non-neoplastic diseases. Symptoms relate to wearing tight shoes and high heels. The diagnosis is clinical but it is done with the aid of imaging tests. The objective of this study is to demonstrate the diagnostic impressions in the Ultrasonography (US) exams of the feet related to Neuroma, by data analysis during the year 2017 in a clinic in Goiânia-Brazil. In addition, to demonstrate that the US may be the primary exam for the diagnosis of MN. In the analyzed tests (made by an Esaote device), the variables used were MN, MN associated or not to intermetatarsal bursitis (IB) and MN associated or not to plantar fasciitis (PF). After analyzing the charts, it was observed that 278 patients were diagnosed with MN. The patients’ ages ranged from 19.0 to 93.0 years and the size ranged from 3.70 to 21.0mm. Being 85.6% female and 14.4% male. Regarding sex and side, it was observed that in men, 30% had right side, 42.5% left and 27.5% bilateral; in women, 26.1% were right, 29.8% were left and 44.1% were bilateral. Regarding gender and location: in men 12.5% in the second space, 70% in the third and 17.5% in the two; in women, 25.8% in the second, 34.2% in the third and 40% in both. In relation to IB: 24.1% with and 75.9% without IB. In relation to PF: 30.6% with and 69.4% without PF. It is concluded that MN is prevalent in female, bilateral, in the second and third intermetatarsal space and that there is a significant association with PF and IB.
RIGHT VENTRICULAR OUTFLOW TRACT TISSUE DOPPLER PARAMETERS IN HEART FAILURE.

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Right ventricle (RV) plays important role in Heart Failure. Inflow and outflow tracts of this chamber are functionally and morphologically different. The inflow tract of RV (RV in) was actively studied by different EchoCG methods in normal and pathologic state, but there is little information about RV outflow tract.

Aim: To investigate RV outflow tract (RVout) pulsed wave TDI qualitative and quantitative parameters in patients with congestive heart failure (HF).

Material and Methods: We studied 125 healthy volunteers and 100 patients with 2-4 NYHA fcl HF. RVout pulsed wave TDI was registered from subcostal position with sample volume on RV lateral wall, near the pulmonary valve. RVin TDI was registered in apical 4 camber view with the sample volume positioned at lateral wall near the tricuspid valve.

Results: The pattern of TDI from RVout was quite different from pattern of TDI of RVin. It was characterized by prominent positive wave in isovolumic contraction period (Sict), high positive wave at the beginning of systole (S) with sharp decrease of velocity, prominent negative and positive waves during isovolumic relaxation period (Eict1 and Eict2) and two negative waves in diastole (E and A waves). The TDI waves of RVin where significantly greater then corresponding waves on RVout TDI. The velocity of systolic and diastolic waves of RVout TDI where significantly lover in HF patients, than in control group ( Sict 4.0±1.4 versus 6.4±1.9 cm/sec; S 7.9±1.8 versus 9.2±2.4 cm/sec; Eict1 -3.9±1.9 versus -9.2±2.4 cm/sec; E --4.4±1.3 versus -7.4±1.8 cm/sec, p<0.001).

Conclusion: In normal persons the TDI pattern of RV inflow and outflow tract is qualitatively and quantitatively different. In patients with HF the systolic and diastolic wave velocities where significantly lower compared to the normal persons.
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PULMONARY ULTRASOUND EXAMINATION IN DIAGNOSIS AND MONITORING OF PULMONARY CONGESTION IN HEART FAILURE.

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Background and Aim: Pulmonary congestion is useful marker of decompensated HF. The aim was to study the importance of Lung "Comet tail" artefact in diagnosis and monitoring of Pulmonary Congestion in patients with different types Heart Failure.

Methods: We studied 430 patients with II-IV NYHA class HF (238 with Reduced EF HF -SHF, 100 patient – middle range EF HF-MHF, and 92 patients – HF with preserved systolic function - DHF), 70 patients with chronic obstructive pulmonary disease (COPD) and 175 patients with different heart diseases but without HF (control). Ultrasound evaluation of a lung was done in horizontal or vertical positions of patient, from 10 points of thoracic wall which corresponded to the projection lung lobes.

Results: In patients with CHF we significantly often found the "Comet Tail" artefact (CTa) There was good correlation between the count of CTa registration points from the thoracic wall and the heart failure NYHA class (r=0.57), left ventricular systolic (r=0.43) and diastolic (r=0.34) diameters and negative correlation with EF% (r=-0.44). In the HF gr. CTa was registered from 3 or more points of thoracic wall in 89.6%, in SHF -93%, in MHF -89%, and in DHF -83%, in COPD -9% and in control -7% of patients. If we take 4 points and more as a reference value, the sensitivity of sign in diagnosis of pulmonary congestion due to HF, was 83.5% and specify – 97.6%. In CHF group CTPh was prominent, protracted and multiple while in the II group it was single and short lasting. After use of diuretics CTa disappears or was less prominent and the count of CTa registration points from the thoracic wall was lesser then before treatment.

Conclusion: Thoracic US is accurate method for evaluation and monitoring of pulmonary congestion in patients with systolic and diastolic HF. The US sign of pulmonary congestion is a CTa, which is multiple and registered from larger area of thoracic wall (4 points or more).
RIGHT VENTRICULAR OUTFLOW TRACT M-MODE ECHO CG IN PATIENTS WITH MIDDLE RANGE AND PRESERVED EF HEART FAILURE

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Right ventricle (RV) plays important role in Heart Failure. Inflow and outflow tracts of this chamber are functionally and morphologically different. The inflow tract of RV was actively studied by different EchoCG methods in normal and pathologic state, but there is little information about RV outflow tract.

Aim: To investigate RV outflow tract (RVout) M-mode EchCG fractional shortening (FS%) in patients with congestive heart failure (HF).

Material and Methods: We studied 330 healthypersons and 500 patients with HF (258 patients with Reduced EF HF, 122 – with middle range HF and 122 – with HF with preserved EF). 146 patient had 1-2 NYHA fcl, and 355 – 3-4 NYHA fcl. RVout M-mode EchCG was registered from parasternal short axis view. It was measured RV outflow diastolic (RVd) and systolic (RVs) diameters. RVout FS% was calculated by formula (RVd-RVs)/RVd%.

Results: The RVd and RVs was significantly greater (29.4±4.5mm versus 34.6±5.2mm and 13.4±5.1mm versus 21.4±5.1mm respectively, p<0.001) and RV FS% was significantly lower(57.0±5.8% versus 35.0±11.0%, p<0.001) in patients with heart failure compared to normal persons. If we take for RV FS%<50% as reference point the sensitivity and specifity of this parameter in diagnosis of heart failure is 0.926 and 0.958 respectively.

Conclusion: There are prominent changes in RVout structure and function. In patients with HF the RV outflow tract systolic and diastolic diameters and FS% was significantly different from normal persons. RVout FS<50% can use as EchoCG sign of HF.
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BOWEL CONTRAST-ENHANCED ULTRASOUND PERFUSION IMAGING IN THE EVALUATION OF CROHN’S DISEASE PATIENTS

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Background: Evaluation of inflammation in Crohn’s disease (CD) is crucial for treatment planning and monitoring. The use of contrast enhanced ultrasound (CEUS) could be important in the diagnosis and follow up since it is a non-invasive and easily repeatable method.

Aim: We aimed to prospectively evaluate the role of CEUS in CD.

Material and methods: 54 patients with active ileal CD starting infliximab were enrolled. Clinical assessment, laboratory tests and CEUS were performed at baseline (T0) and after 2 (T1), 6 (T2) and 12 weeks (T3) of treatment to assess variations in peak intensity (PI), area under the curve (AUC), slope of wash in (Pw), time to peak (TP), mean transit time (MTT). Deep remission was defined as SES-CD=0 or decreased of at least 1 unit plus CDAI <70 at T3. Clinical relapse was assessed up to 3 months.

Results: 70% of patients achieved deep remission (responders). The delta between T0 and T1 was significantly different in responders and non-responders in PI, AUC, Pw and MTT. 95% of patients showed a reduction in PI, 100% in AUC, 84% in Pw, 26% in TP and 50% in MTT. There was a good correlation between ratio in CEUS parameters between T1-T0 and T2-T0 and T3-T0. The 8 patients who relapsed showed lower mean percentage reduction in delta PI between T1 and T0 and between T2 and T0 compared to patients in remission (-8.4 vs -20.76, p=0.038) and a new increase at T3 (15.6 vs -62.9, p<0.001). No significant differences in delta AUC have been found in relapsers and non relapsers at T1 (-25 vs -23.7, p=ns), but reduction in AUC values are lower at T2 (-53 vs -32.1, p=0.007) and T3 (-62.4 vs -3.9, p=0.001) in relapsers. About Pw, at T1 and T2 mean percentage of reduction are higher in patients who will maintain remission (-23.2 vs -1.9, p=0.008 and -38.6 vs -15.8, p= 0.006, respectively) with a return to results similar to baseline at T3 in relapsers (-51 vs -0.42, p<0.001).

Conclusion: CEUS could be useful as reliable predictor of deep remission and clinical relapse in patients with CD treated with infliximab.
ROLE OF INTRACAVITARY CONTRAST-ENHANCED ULTRASOUND (IC-CEUS) IN INTERVENTIONAL PROCEDURES CARRIED OUT BY A SINGLE CLINICIAN: AN EXAMPLE OF POINT-OF-CARE ULTRASOUND (POCUS)

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OBJECTIVES
Aim of this study was to assess the contribution of IC-CEUS (i.e. injection of diluted sonographic contrast agent into needle/catheter) to interventional procedures carried out by a single clinician. METHODS
In 36 patients (23 M/16 F, median age 68 yrs, range 35-91) a single physician performed catheter drainage (34) or needle aspiration (3) in the following conditions: abdominal abscess (13), non-infected abdominal fluid collection (10), hepatic abscess (HA) (5), gallbladder empyema (3), subcutaneous post-operative fluid collection (3), pancreatic pseudocyst (2), neoplastic ascites (1). All patients underwent IC-CEUS (0.5 mL of SonoVue in 20 mL of saline) at the time of catheter/needle placement and during the follow-up of catheters left in place.

RESULTS
Immediate IC-CEUS allowed the clinician to verify correct positioning of needle/catheter inside the target in all cases, to demonstrate communication of 2 HA with biliary tree, and to choose therapeutic approach (needle aspiration instead of catheter placement) in 2 HA (one with multiple non-communicating cavities, the other with small fluid core in a huge mass). Follow-up IC-CEUS helped the physician with management of 34 catheters left in place: in 7 cases early removal was needed owing to either obstruction (3) or dislodgement (4); in 5 post-operative extrahepatic fluid collections biliary fistula was shown prompting endoscopic treatment; in 1 patient with cholecystostomy IC-CEUS demonstrated free passage in the abdomen confirming clinical suspicion of choleperitoneum. In all cases IC-CEUS helped the physician with appropriate timing of catheter removal by providing information on catheter malfunctioning (due to obstruction/dislodgement) and size of residual undrained cavities.

CONCLUSIONS
IC-CEUS represents an excellent example of PoS-US since it allows the interventional clinician to immediately assess needle/catheter placement success and take therapeutic decisions. In addition, IC-CEUS provides fundamental information on removal timing since it can assess catheter malfunctioning and the real size of the residual undrained cavity.
Objectives: To evaluate a possible influence of microangiopathy upon the renal graft stiffness, by assessing donor’s age and atherosclerosis degree, the immunosuppressant dosage, RI and time-intensity (TIC) parameters.

Methods: Seventy-seven patients with a kidney transplant were evaluated with GE Logiq E9, multimodal ultrasound including Shear Wave Elastography and global CEUS. The evaluated statistical unit was the ultrasound examination of the kidney graft. SWE was assessed in two distinct zones (A and B) with five measurements on each zone (reported as mean value) on cortical of kidney graft.

Results: The number of US examinations varied from one to four, a total number of 149 examinations being evaluated. The sample contained 42 patients with medium atherosclerosis and 99 with minimum or no atherosclerosis. The SWE rigidity on medulla measured in zone A proved significantly related with the donor age ($\rho = -0.19$, $p=0.029$). No significant differences were observed when the SWE from cortex was compared between those with (median = 22.52) and without/minimal (median = 27.19) atherosclerosis ($p>0.30$). The immunosuppression was recorded as appropriate (84 cases), overdosed (25 cases), under-dosed (24 cases) and inadequate (1 case) with significantly differences between groups on cortical B zone ($p=0.0493$). The post-hoc analysis identified significant higher SWE values on the under-dose (median=30.98) group as compared to the overdose (median=20.25, $p=0.0278$). No significant differences between MDRD groups regarding SWE were observed ($p>0.30$). A weak positive significant correlation was observed between SWE cortical zone A and cortical thickness ($\rho =-0.17$, $p=0.047$). No significant correlation between SWE and IR were observed ($p>0.30$). Weak positive correlations were observed between SWE on cortical measured on both zones and global and segmental artery PE and WiAU TIC parameters ($0.18 \leq \rho \leq 0.28$, $0.0275 \leq p \leq 0.0007$).

Conclusions: Modified TIC parameters and under-dosed immunosuppressants could influence the stiffness of the renal graft, unlike RI and atherosclerosis degree.
SHEAR WAVE ELASTOGRAPHY IN THE EVALUATION OF RARE KIDNEY PATHOLOGIES

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Objectives: Shear wave elastography (SWE) has been proved as a reliable indicator of kidney fibrosis in CKD as it was recently stated. Utility of it in rare kidney disorders was not studied yet.

Methods: We annalised 10 cases of rare kidney disorders: renal cortical tubersulosis, bilateral angiomaatosis in tuberous sclerosis, isolated angiomylipoma and secondary amiloidosis. We measured the Young modulus (YM) parameters in kPa, at normal cortical area and within the pathologic area. We followed a fixed measurement: at maximum 4,5 cm deep, using a standardized box of 0.5/0.5 cm, strict in the cortical area and in the middle of the affected area. Two measurement were done in each area and a media was calculated.

Results: A medium value of 6.75 kPa was found in the normal renal parenchima. Medium values of YM were significantly higher 11.56-18.45 kPa (p<0.05) in affected areas of focal kidney lesions caused by specified previously diagnosed diseases. Comparing the YM values in different renal lesions we found the biggest values in the hiperechogenic areas of renal tuberctulosis localized at the perifery if the cortical zone, bilateral.

Conclusions: Elastography is a reliable method that can be used also in the characterisation of kidney focal lesions. More studies are needed in rare kidney diseases in which ultrasonography is a mandatory examination.
RECENT CARDIAC INSUFFICIENCY IN PATIENT WITH LIBMAN-SACKS ENDOCARDITIS

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Objective:
To study a 26-year-old woman with medical history of hypertension and pre-eclampsy with proteinuria during pregnancy.

Patient and methods:
She arrives at hospital emergencies because she presents dyspnea from about two months ago which progressed until it appeared with minimal efforts, orthopnea and edema in both lower extremities. She refers periods of intercurrent high temperature 38.8°C, arthralgies and numbness of both hands.


Complementary tests:
Chest X-ray: augmented cardiothoracic index and bilateral alveolar infiltrate.
EKG: Sinusal tachycardia at 150 bpm.
Blood test: Hemogram: leucocitosis 20,000x10e9L with neutrophilia. Biochemistry: globular sedimentation rate 78mm/h. Urine: microalbuminuria: 1288.9mcg

Echocardiography in emergency box: dilated left ventricle. Severe mitral regurgitation with affection of both veils. Moderate tricuspid regurgitation with severe pulmonary hypertension and elevation of central venous pressure.

Results:
Libman-Sacks endocarditis with differential diagnoses: Subacute bacterial endocarditis or enterococcal endocarditis over previous valvulopathy, maric endocarditis in a patient with systemic lupus, miocarditis. Transthoracic echocardiography:
Mitral valve with retraction and thickening of the free edge of the festoons. In the ventricular side of both veils, appear two sesile and nodular images; one in the posterior veil which is 4.9x 4.2mm and another one in the anterior veil which is 2.8x 4.3mm. These findings are very suggestive of Libman-Sacks endocarditis. This organicity generates a coaptation defect with mitral regurgitation.

Conclusions:
Libman-Sacks endocarditis is a non-bacterial endocarditis which consists in the inflammation of the posterior veil of the mitral valve of the heart through the formation of granulomatous vegetations made of fibrin, neutrophils and histiocytes which may be visualized in the echocardiography in up to 28-74% of patients like nodular images. It is capable of producing in a silent manner a mitral regurgitation which clinically produces a cardiac insufficiency.
Objectives To compare the visibility of breast tissue markers within breast cancer on ultrasound (US) after neoadjuvant chemotherapy (NAC) and to analyze whether the type of marker has an effect on choosing localization methods after NAC.

Methods We included 153 tissue markers inserted within breast cancers with pathologically complete response (pCR) after NAC from January 2012 to April 2017. One of three types of marker (surgical clip, Cormark™, and UltraClip®) was inserted. Medical records and imaging findings were retrospectively reviewed. We compared the visibility of the different types of tissue marker on US after NAC, and also compared the imaging modalities used in preoperative localization. The Chi-square test, Fisher’s exact test and multiple logistic regression were used for analysis.

Results Of the 153 tissue markers, 56 were surgical clips, 61 Cormark™, and 36 UltraClip®. After NAC, residual lesions were not seen on US in 42 cases (27.5%). In multivariate analysis, the visibility of the surgical clip or Cormark™ was better than UltraClip® (OR (95% confidence interval, p-value) was 5.467 (1.717-17.410, 0.004), 3.045 (1.074-8.628, 0.036), respectively). Among the 131 cases where localization targeting the marker was required, the proportion of US-guided localization being performed was significantly higher when using the surgical clip than UltraClip® (OR (95% confidence interval, p-value) was 5.566 (1.610-19.246, 0.007)) in multivariate analysis.

Conclusions. The type of breast tissue marker affects its visibility on US in cases with pCR after NAC which in turn affects the localization methodology.
OPTIMISING THE DIAGNOSTICS OF ACUTE APPENDICITIS: THE ROLE OF ULTRASOUND IN REDUCING NEGATIVE APPENDECTOMIES RATE.

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Objectives
Acute appendicitis is the most common cause of acute abdominal pain that requires emergency surgery. Unfortunately there is still a huge discrepancy in negative appendectomy rates between the countries, reflecting that preoperative diagnostic workup is still not sufficient enough. Our purpose was to compare two different diagnostic approaches for diagnosing acute appendicitis in adults.

Methods
Two retrospective analysis of adult patients who were admitted to emegency department with suspected acute appendicitis were done: first study analysed group of 554 patients who underwent operation for suspected acute appendicitis in period of 2008-2013 and the second group of 1901 patients form whom 459 underwent operation for suspected acute appendicitis after implementation of conditional CT strategy in 2016. The results of both algorithms were compared and the effectiveness of conditional CT protocol was evaluated.

Results
Implementation of Conditional CT strategy lowered negative appendectomy rate from 22.9 % to 3%. Increase in imaging usage was noticed: ultrasound form 75 % up to 97 % and CT from 3.4% up to 25 %. Abdominal ultrasound detected inflamed appendix in 67,5% of cases, with a sensitivity and specificity of 58% (CI 0,53;0.63), 100% (CI 0,99;1.00). The sensitivity and specificity of CT scan was 84 % (CI 0.77;0.89) and 98 % (CI 0.96;0.99). Nevertheless the amount of negative CT scans was up to 48%.

Conclusions.
Conditional CT strategy significantly reduces the amount of negative appendectomies, however it also increases exposure to ionising radiation, and unnecessary CT scans rate. Taking in to account that potential patient population includes mostly young adults, predominantly women, some new alternatives such as observation and repetitive ultrasound examination could be a field for a further search.
HOW MANY MEASUREMENTS ARE NEEDED FOR LIVER STIFFNESS ASSESSMENT BY 2D-SHEAR WAVE ELASTOGRAPHY (2D-SWE.GE)?

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Background and Aim: While the manufacturer recommended the use of 10 liver stiffness measurements (LSM) to quantify liver stiffness by 2D-SWE.GE, it has been demonstrated that 5 LSM are enough to quantify LS by 2D-SWE.GE [1]. The aim of this study was to evaluate the reliability of 3 vs 5 measurements in a cohort of patients with or without chronic liver disease.

Material and Method: 333 consecutive patients with or without chronic hepatopathies, in whom LS was evaluated by 2D-SWE, using LOGIQ E9 (GE Healthcare), were included in the study. The mean, median, standard deviation (SD) and interquartile range (IQR) of 3 and 5 measurements were collected for each patient and compared to each other. Reliable LSM were defined as the median value of 5 or 3 measurements acquired in a homogenous area of liver parenchyma and an interquartile range/median (IQR/MED) <0.30.

Results: Reliable LSM were obtained in 92.5% (308/333) of patients using 5 LSM and in 94.9% (316/33) using 3 LSM (p= 0.26). The mean kPascal (kPa) value of the median, mean, SD and IQR for 5 and 3 measurements were 10.26, 10.30, 1.49, 1.56 and 10.37, 10.75, 2.96, 1.25 respectively. No significant differences were found between 3 LSM and 5 LSM regarding the median, mean and SD (all p > 0.05). Significant difference was observed only regarding IQR (p= 0.0026).

Conclusion: 3 LSM using 2D-SWE.GE seem to be reliable for LS evaluation with an increased feasibility of the method.

ULTRASOUND IN SOFT TISSUE RETROPERITONEAL SARCOMAS – CONTRIBUTION TO THE DIAGNOSTIC

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The prognostic of soft tissue retroperitoneal sarcomas (STRS) are based on highly variable symptoms and physical findings, tumor grade, size, depth or metastases and as a first line on the real-time capability of ultrasound for the location, volume and tumoral structure.

A retrospective study was performed to define the relationship between clinical, sonographic features, and histology, in patients with SRTS.

Material and method. We considered a consecutive retrospective series of 29 patients (11 men and 18 women) 9 - 75 years aged with 34 primitive retroperitoneal masses evaluated first on ultrasound exam and after surgery and histology. The criteria for inclusion were the histologies of primitive retroperitoneal tumors, after the exclusion of metastatic, gastrointestinal or genitourinary tumors, two independent ultrasound observers - 2D US, color/power Doppler, CT or MRI imaging and histology results.

Results. The general ultrasound findings were heterogenous voluminous lobulated tumors, with irregular contours (hyperechoic in the middle/ hypoechoic in periphery and 13 cases izo - or hypo echoic mass) without peritumoral capsule, but relatively well circumscribed, with necroses, septa, calcifications, increased chaotic and tortuous intra tumoral vascularity for 18 cases or no vascularity seen in 11 cases, peritumoral invasion.

The most frequent histologies were fibrous malignant hystiocitoma and liposarcoma but we also found rare tumors as malignant synovioma or pericitosarcoma. We found quite frequently local recurrences – as small, round and hypoechoic masses. The sensitivity and specificity in the detection of local recurrences were 80% and 90%, respectively, for MRI and 92% and 81%, respectively, for sonography.

Conclusion. Ultrasound offered a good pre-interventional assessment of STRS. In our study MRI and sonography appear to be equally useful in the detection of local recurrences. Ultrasound exam could be the first diagnostic line for STRS and can be used for routine follow-up and in guiding needle biopsies.
LYMPHOID ORGANS CONDITION IN CHILDREN WITH JUVENILE PAROTITIS

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Objectives
Juvenile parotitis (JP) is the most common inflammatory disease of parotid glands (PG) in children. It characterize with persistent course with exacerbations and remissions and great difficulties in treatment. Evaluation of lymphoid organs condition in children with JP based on complex ultrasound examination (US).

Methods
50 patients 3.5-10 years (29 boys and 21 girls) with different stages of JP were undergone US of PG, neck and mesentery lymph nodes (LN), spleen.
Evaluated LN parameters: linear size and L/S ratio, cortical layer thickness, gate LN artery peak velocity (Vmax).
Evaluated spleen parameters: lymphoid follicles number, size and distribution; spleen mass coefficient (SMC) – ratio of the spleen mass and the body weight.
The relationships of LN and SMC parameters were analyzed mathematically.

Results
LN analysis:
- jugulodigastral LN: 
  linear size 24.7mm to 31.5mm (27.4 + 1.2mm); 
cortical layer thickness: 1.1 - 1.5 mm (1.3 + 0.14 mm); 
Vmax: 11.7-18.5 (14.5 + 2.1 cm/s).
- mesenteric LN: 
  linear size: 11.7mm to 15.6mm (14.0 + 0.9mm); 
cortical layer thickness: 0,7 - 1,0mm (0,85 + 0,1mm); 
Vmax: 4.1-8.5 (6.4 + 1.7 cm/s).
- L/S ratio of cervical and mesenteric LN: 2.1: 1 - 3.2: 1 (2.74 + 0.31);
Spleen analysis:
- SMC ranged from 3.9 to 5.7 (mean group = 4.4 ± 0.4) (norm = 2-4).
- lymphoid follicles: number and size increased together with SMC.
Mathematical analysis confirmed the direct relationship of LN and SMC parameters.

Conclusions
The systemic lymphoid organs (cervical and mesenteric LN, spleen) hyperplasia in JP patients was revealed. This indicates the immunocompromise of these patients. The obtained data show the important role of the immune system in JP pathogenesis.
INTRAOPERATIVE LUNG ULTRASOUND AS A NOVEL TOOL IN VIDEO THORACOSCOPIC ASSISTED THORACIC SURGERY (VATS)

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Objectives: A minimally-invasive surgical approach for lung resections has become mandatory even if lung subcentimetric nodules detection could be challenging. The aim of our study was to assess the detection and characterization power of Intraoperative Lung Ultrasound.

Methods: 50 lung nodules (main diameter less than 2 cm on pre-operative Computed Tomography) have been scanned with a 10 mm laparoscopic linear probe (12 MHz) during tri-portal Videothoracoscopic Assisted (VATS) wedge resections. 23/50 were central nodules, while 27/50 were peripheral ones. We evaluated the number of nodules detected by Intraoperative Lung Ultrasound, their echostructure (presence/absence of hyperechoic spots) and morphology. We also marked the nodules margins identified with the Intraoperative Lung Ultrasound. Chi-squared test was used for the statistical analysis.

Results: Thanks to Intraoperative Lung Ultrasound, we identified both central and peripheral nodules. The margins detected by ILU and the proper hystological margins matched in 90% (45/50) of the surgical samples. All the 12 benign nodules had a clear, defined linear interface between the nodule and the surrounding lung parenchyma. On the other hand, the interface of all the 38 malignancies was not well-defined and discontinuous. There was no statistically significant relation between the echostructure and the histology; 24/34 hypoechoic nodules (70%) were malignancies but this relation was not statistically significant (p>0.10). The hyperechoic spots were present only in the 45% of the malignant lesions (p>0.25).

Conclusions: According to our data, ILU could be considered a valuable complimentary tool for detection and characterization of pulmonary nodules in VATS. The clear interface of benign nodules may help the surgeon to decide the width of resection prior to intraoperative histologic examination.
Spleen Mass Coefficient in Children Living in the Territories with Different Man-Made Loads

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Objectives
The man-made load (MML) is a significant parameter of the residence territory which affects the immune system condition. Studying the impact of spleen mass coefficient (SMC) in children and determination of an opportunity for using the SMC mean group value for assessing the MML of residence territory.

Methods
813 patients 3-17 years old living in the territories with different MML (resort zones, mining and industrial processing zone (potassium salts), metallurgical zone, organic compounds synthesis zone) were examined. All children underwent ultrasonic examination (US) of the spleen with the SMC calculation (the ratio of the spleen mass to the body weight).
More than 6550 blood tests for the concentration of metals and organic compounds determination were obtained in 450 children.
A comparative analysis of the SMC mean group value in children living in different MML territories was carried out.
Mathematical analysis was applied for demonstration of the dependence of changing SMC value and chemicals concentration in the blood.

Results
The increase of organic compounds and metals concentration in blood caused the growth of SMC (p<0.05). The significant differences in SMC mean group value (p<0.05) between children living in resort zones (2.99 ± 0.21) and in industrial zones (mining and industrial potassium salts processing zone = 3.45 ± 0.15, metallurgical zone = 3.75 ± 0.19, organic compounds synthesis zone = 3.57 ± 0.17) were revealed.

Conclusions
SMC value is the reflection of reactive lymphoid tissue hyperplasia as a reply on the MML in the living territory.
The SMC value may be a criterion of the immune system adaptive changes to environmental factors. It may be used both for individual evaluation of the child’s immune system condition and – at the population level – for comparative assessment of the MML in the residence territory.
VALUE OF DOPPLER ULTRASOUND IN DIAGNOSIS OF SPLENIC ARTERY ANEURYSMS AND MONITORING PATIENTS AFTER EMBOLIZATION.

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Objectives: Aneurysms of visceral arteries constitute a serious threat to life (mortality rate: 10-25 percent), although they are rarely diagnosed. Visceral aneurysms are most often located on the splenic artery, but are four times more often in women.

Methods: The study involved a group of 22 patients, including 17 women who were diagnosed in ultrasound examination with a splenic artery aneurysm. In all patients, the ultrasound examination was performed with the Logiq 7 GE machine using a 3.5 MHz probe.

Results: A single aneurysm of the splenic artery was diagnosed in all 22 patients. In the group of 18 aneurysms located in the distal part of the artery in splenic hilum 6 reached a diameter of 18-22 mm, while the remaining 12 aneurysms diameter of 11-17 mm. The remaining 4 aneurysms were located in the middle part of the splenic artery and reached a diameter of 12-16 mm. Among 6 aneurysms with a diameter of 18-22 mm, 5 of them were diagnosed in women of childbearing age and these patients were qualified for embolization. Controlled ultrasound examination performed after embolization confirmed the effectiveness of the procedure and total exclusion of the aneurysms from the circulation.

Conclusions: The ultrasound examination allows the unequivocal diagnosis of splenic aneurysms located in the distal part of the artery and qualification for endovascular treatment. Ultrasound examination is the method of choice in monitoring patients after embolisation of splenic aneurysms.
A 37-year old female was referred for retrosternal chest pain and chest tightness for one month with a prior history of hypertension and a trans-thoracic echocardiogram (TTE) examination was required. TTE indicated strip-like structures adhering to aortic valve (arrows) and prolapsed to left ventricular outflow tract in diastole (Panel A) and aortic valve vegetation was suspected. Mildly dilated ascending aorta (inner diameter of 41mm) was also revealed. Very interesting findings were demonstrated by trans-esophagus echocardiogram (TEE). A circumferential dissection and torn intima 1.5cm above the aortic annulus was detected in systole (Panel B) and prolapse into left ventricle in diastole (Panel C) at apical long-axis view of left heart by 2-dimensional TEE and 3-dimensional TEE (Panel D). Circumferential dissection with full detachment was better demonstrated at the short axis view of ascending aorta by 2-dimensional TEE (Panel E) and 3-dimensional TEE (Asterisks in Panel F). Stanford type-A aortic dissection with retrograde of intima into left ventricle was confirmed by TEE. 64-sliced CT also indicated an aortic dissection (arrowheads) involving the ascending aorta and aortic arch, and suspected of the prolapse of aortic valves or torn intima into left ventricle (arrows, Panel G-H). A circumferential dissection (Asterisks) was located at the ascending aorta and extended to aortic arch (Panel I) with prolapse of intima flap into left ventricle after thoractomy and aortotomy, then the patient was underwent an urgent Bentall operation with the replacement of ascending aorta, aortic arch and trunk stent.
PALPABLE NODULAR LESIONS IN THE FOOT: DIFFERENTIAL DIAGNOSIS BY ULTRASOUND

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Objectives:
To remember the most frequent nodular lesions in the foot.
To show the echographic findings that allow to make their correct differential diagnosis.

Methods:
We have reviewed the echographic images of patients who came to the radiology department of our hospital with palpable nodules in the foot.
We have considered both acute onset and long-term lesions, both symptomatic and asymptomatic.

Results:
The most frequent nodular lesions that are diagnosable and differentiable by ultrasound are ganglion cysts, Morton’s neuromas, nodular fasciitis and tenosynovitis.
Other less frequent entities include angiomas, granulomatous or fibrotic-posttraumatic lesions.
Each of these entities shows echographic characteristics in both B-mode and Doppler-mode, which allows us to accurate the differential diagnosis and to deepen their characterization.

Conclusions:
Due to their superficial location the palpable nodular lesions of the foot are easily accessible and characterized by ultrasound.
For this purpose, it is fundamental to know the echographic peculiarities of each of them.
ASCITIS MUCINOSA SECUNDARIA A PSEUDOMIXOMA PERITONEAL DE ORIGEN INCIERTO. A PROPÓSITO DE UN CASO CLÍNICO.


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CASO CLÍNICO:
Se presenta el caso de varón de 64 años sin antecedentes de interés que ingresa por distensión abdominal de 5 meses de evolución, sin otra clínica asociada. En la exploración física destacaba semiología de ascitis. Se realizó paracentesis de líquido ascítico en el que se obtuvieron 220 leucocitos 91% linfocitos, glucosa 44 mg/dL, proteínas totales 5,22 g/dL, albúmina 2,5 g/dL, LDH 235 UI/L, ADA 28 UI/L, cultivos y citologías negativos para etiología infecciosa y tumoral. Se realizó tomografía axial computarizada informada de abundante líquido ascítico con implantes en raíz del mesenterio sugestivos de carcinomatosis peritoneal, sin apreciar lesión visceral que justificase los hallazgos. La gastroscopia y colonoscopia no mostraron lesiones mucosas. Se solicitó ecografía abdominal digestiva en la que se confirmó la existencia de ascitis moderada y engrosamiento mesentérico a todos los niveles, heteroecogénico a expensas de múltiples formaciones redondeadas quísticas/anecogénicas en su interior. Se realizó biopsia con aguja de aspiración de 18 G, obteniendo cilindro de tejido gelatinoso que fue compatible con pseudomixoma peritoneal (PP). En sesión multidisciplinar se decidió realizar cirugía citorreductora (CR). Tras analizar las piezas quirúrgicas se diagnosticó de adenomucinosis peritoneal sin objetivar origen primario del mismo.

DISCUSIÓN:
El PP es un tumor maligno de bajo grado que se caracteriza por ascitis mucinosa con implantes peritoneales epiteliales y mucinosos secundarios a ruptura ó metástasis de un tumor primario. Es poco frecuente, con una incidencia de 1-2 casos por 1.000.000 habitantes/año. Los tumores primarios que lo ocasionan son el carcinoma de apéndice (52%), ovario (34%) y colon (4%). Sólo el 5% de los casos no se encuentra el origen, como ocurrió en nuestro caso. El diagnóstico diferencial incluye carcinomatosis peritoneal y otros tumores raros de localización peritoneal. Requiere enfoque multidisciplinar para su abordaje terapéutico, siendo la CR el tratamiento de elección, asociando en ocasiones quimioterapia hipertérmica intraperitoneal (HIPEC).
HEPATIC CYSTIC ECHINOCOCOSIS: ULTRASONOGRAPHY FINDINGS

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Human cystic echinococcosis is a zoonotic infection caused by the larval stage of the cestode Echinococcus. Canids are the definitive host, but many intermediate ones are involved, usually humans and farm animals, infected via fecal-oral transmission through egg-contaminated water or contact with infected dogs. E. granulosus is endemic in rural areas of South America and Eurasia, but has a wide geographic distribution in all continents. In humans, the disease is characterized by slowly growing cysts, commonly occurring in liver and lungs, that can go undetected for years. Clinical features of hepatic disease range from asymptomatic patients to abdominal pain, nausea and vomiting, or even severe complications, such as cyst rupture into the biliary system, causing obstructive jaundice or into the peritoneum.

We report the case of a Spanish 54-year-old woman raised in a rural area with previous farm animal contact and a two-month history of right upper quadrant pain. Blood sample demonstrated eosinophilia and abnormal liver tests. Ultrasonography showed a 14-cm cyst in the right liver lobe, with many anechoic images inside and multiple internal septum, corresponding with daughter vesicles within the cyst, and inner wall infoldings, revealing the detached, folded endocyst ("waterlily sign"). The patient was diagnosed of echinococcal cyst in transition phase, and was successfully treated with albendazole and elective surgical right hepatectomy.

Ultrasonography (US) is the imaging method of choice for the CE diagnosis, staging and following, due to its accessibility, lack of radiation and high sensitivity and specificity. It’s findings allow to classify the cysts as active (anechogenic cyst with or without fine echoes inside representing the hydatid sand, or multilocular lesions), transitional, as our case, and inactive (with partial or totally calcified wall), leading to a proper treatment. US has also an important role in treatment in selected cases by guiding percutaneous aspiration-injection-reaspiration (PAIR) technique.
LIVER LEIOMYOSARCOMA DIAGNOSED BY SEUS. THE IMPORTANCE OF CONTRAST IN ABDOMINAL ULTRASOUND SCAN.

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Objectives
To know the importance of contrast in abdominal ultrasound, demonstrating the clinical and economic profitability of the use of Sonovue® in the diagnosis of liver lesions by abdominal ultrasound.

Methods
Description of a clinical case

Results
In February 2017, a 56-year-old female presented to the University Regional Málaga’s Hospital with abdominal pain and weakness that had persisted for one year. A physical examination revealed hepatomegaly and jaundice. The patient had no medical history of previous liver diseases or alcohol abuse. Laboratory analysis showed altered liver functions. Other laboratory tests, including hepatitis B surface antigen, hepatitis C virus antibody, α-fetoprotein, were normal.

Abdominal ultrasonography revealed one well-defined heterogeneous hypoechoic mass in left lobe of the liver (Iva segment). The size of the mass was 12×9×8. Ultrasound contrast intravenous (sonovue) was applied showing malignant profile of the lesion. In the early arterial phase, the lesion becomes hyper-enhancing with respect to the surrounding liver. The mass is iso-enhancing in the portal venous phase. The mass showed a slow and mild washout and becomes hypoechoic in the late phase. (Fig. 1). Consequently, resective surgery of the lesion was performed. The histopathological study of the surgical specimen was compatible with hepatic leiomyosarcoma.

In conclusion, it was evidenced that with a single well-interpreted diagnostic test (abdominal ultrasound with contrast) it was possible to diagnose a malignant liver lesion and treat it adequately, which demonstrates the high profitability of having a contrast ultrasound for the diagnosis of liver injuries.

Fig. 1

Conclusions.
In conclusion, and as evidenced in the literature written about it, abdominal ultrasound with contrast is a useful tool in the diagnosis of liver injury, since it reliably differentiates benign lesions (which require follow-up) from malignant lesions (which require definitive treatment). The clinical case presented is one more example of its profitability.
Carcinomatosis Peritoneal: Un Reto Diagnóstico.

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Caso Clínico
Mujer de 72 años que ingresa por disnea progresiva, distensión abdominal y vómitos recurrentes de un mes de evolución. Durante el estudio etiológico se solicita TC toracoabdominal encontrando lesiones nodulares peritoneales, adenopatías en hilio hepático y retroperitoneales, con ascitis atípica sin identificar tumor primario. Se nos solicita ecografía digestiva, observando adenopatías retroperitoneales y ascitis, junto a dos lesiones ocupantes de espacio (LOEs) no descritas en el TC, en hígado y bazo, hipoecogénicas y sugestivas de malignidad tras estudio con contraste. Además, en torno a cabeza de páncreas, identificamos otra LOE de 25x22 mm hipoecoica de comportamiento hipocaptante; no obstante, posteriormente mediante ecoendoscopia alta se identifica como adenopatía neoplásica peripancreática. Se realiza punción-microbiopsia con resultado de neoplasia maligna linfóide con positividad para CD-20 CD-79a, BCL-6 y BCL-2, diagnosticándose de Linfoma B Difuso de Células Grandes.

Discusión
El linfoma B difuso de células grandes es el linfoma no Hodgkin más frecuente. Se manifiesta con síntomas B (fiebre, sudoración nocturna y pérdida de peso) y adenopatías cervicales y/o abdominales, aunque el 60% de pacientes desarrolla afectación extranodal. El tubo digestivo es la zona más frecuentemente implicada, aunque cualquier órgano podría afectarse, siendo habitual la afectación hepática o esplénica, bien como infiltración difusa o afectación focal. Esta última suele definirse como lesiones focales hipoecogénicas con comportamiento sugestivo de malignidad en el estudio ecográfico con contraste, simulando metástasis. La infiltración peritoneal, llamada linfomatosis peritoneal, es una entidad rara asociada a linfomas de alto grado, principalmente el linfoma B difuso de células grandes, manifestándose como nódulos o masas peritoneales, junto con la presencia frecuente de ascitis, por lo que resulta indistinguible de la carcinomatosis peritoneal en pruebas de imagen.
IMPROVING THE DIAGNOSTIC PERFORMANCE OF ULTRASOUND FOR CLASSIFYING BREAST LESIONS: A POTENTIAL TEACHING ROLE OF S-DETECT FOR RESIDENTS-IN-TRAINING

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Objective To explore the potential value of S-detect, a high-end computer-assisted diagnosis (CAD) software system for residents-in-training.

Methods Routine breast ultrasound (US) examinations were conducted and assessed by an experienced radiologist. Archived images of the lesions (including grayscale, color Doppler flow and elastography images) were retrospectively assessed by each of five in-training residents who were blinded to the histopathological findings and any other US diagnosis. The diagnostic performances of S-detect and the five residents were measured and compared. Afterwards, category 4a lesions assessed by the residents were downgraded when classified as possibly benign by S-detect. The diagnostic performance of the integrated results was compared with the original results of the residents.

Results A total of 195 focal breast lesions were consecutively enrolled, including 82 malignant lesions and 113 benign lesions. S-detect presented higher specificity and area under the curve (AUC) than the residents. After combination with S-detect in category 4a lesions, the specificity and AUC of the five residents were significantly improved. The intraclass correlation coefficient (ICC) of the five residents also increased after integration.

Conclusions With the help of S-detect, the specificity, overall diagnostic performances and interobserver agreements of the residents greatly improved. S-detect can be utilized as an assistant tool for residents-in-training in classifying breast lesions.

Keywords Breast Neoplasms; Breast Ultrasonography; Computer-Assisted Diagnosis
THE DIAGNOSTIC VALUE OF TRANS-ABDOMINAL INTESTINAL ULTRASOUND IN POSTOPERATIVE RECURRENCE AND COMPLICATIONS OF CROHN’S DISEASE

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Objective: To evaluate the accuracy of trans-abdominal ultrasound in detecting postoperative recurrence in crohn’s disease.

Methods A total of 32 patients in PUMCH who received curative resection for the treatment of CD were enrolled. All the patients underwent trans-abdominal ultrasound for the detection of postoperative recurrence of CD. Based on the enteroscopy, histopathology and the Crohn’s Disease Active Index, we divided all patients into the active phase group and the quiescent phase group. To evaluate the diagnostic performance of transabdominal ultrasound in detecting postoperative recurrence of CD, the sensitivity, specificity, and positive and negative predictive value were measured.

Results Among the 32 patients, there were 30 patients in the active phase group, and 2 in the quiescent group. For two ultrasonic signs, the bowel wall thickness >3mm, the loss of bowel wall stratification, the sensitivity, specificity, and positive and negative predictive value were 97%, 100%, 100%, 67%, respectively. A total of 29 cases were accurately diagnosed by ultrasound, and the overall accuracy of ultrasound in detecting fistula (on the anastomosis and other site) and anastomotic stenosis were 100%, 100%, respectively.

Conclusions Due to the specific imaging features of clinical anastomotic recurrence, the trans-abdominal ultrasound plays an important role in monitoring the postoperative recurrence of CD.
THE PREDICTIVE FACTORS FOR THE FISTULA CLOSURE IN PATIENTS WITH CROHN'S DISEASE IN REAL-WORLD EXPERIENCE

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Introduction fistula is one of the most common but dangerous complications of Crohn’s disease (CD), medical therapy, especially the anti-TNF agents had made huge progress in fistula closure in recent year. but a significant number of patients still had to receive surgical therapy due to non-response or intolerable for medical treatment. our study aim to identifying the predictive factor of fistula closure in CD patients so as to choosing the correct treatment for the CD patients with fistula.

Method 58 consecutive patients with intra-abdominal fistula in Peking Union Medical College Hospital, Chinese Academy of Medical Sciences between January 2015 and December 2018 were included. All the patients underwent the CTC or TAUS to evaluate the baseline intestinal conditions. The patients basic characteristics (age, gender), CTC and TAUS findings (Montreal classification of CD, amount of fistula, Anatomic type of fistula, inflammatory bowel wall thickness and other complications), treatment, response to therapy were documented. After 12 months follow-up, according to whether the fistula closed or not in month 12, patients divided into 2 groups. Univariate and multivariate analysis will be calculated via General Linear Models.

Result Fistula closure due to medical therapy was found in 15(25.9%) patients. Surgery was eventually performed in 18 (31.0%) patients. 25 (43.1%) patients had the consistent presence of fistula. the univariate analysis revealed that single fistula(0.010), presence of entero-colonic fistula(0.026) and entero-vesical fistula(0.034) were associated with fistula closure. As for the multivariate analysis, the presence of entero-colonic fistula was the only independent predictive factor for fistula closure.

Conclusion the location of fistula was associated with closure. Imaging modalities can help to accurately identify the predictive factor and select the correct treatment for CD with fistula.
SONOELASTOGRAPHIC EVALUATION OF OVARIAN TERATOMA

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PURPOSE
Ultrasonographic diagnosis of pelvic teratomas may be difficult due to fat contents of the tumor which may simulate pelvic fatty tissue and large bowel air in many cases. In this study we aimed to reveal if strain sonoelastography may have a value in the diagnosis of pelvic teratoma. This is the first report describing sonoelastographic findings of teratomas.

METHOD AND MATERIALS
Twenty-five female cases between 19-65 years old who had diagnosed adnexial teratoma by CT and/or MRI were evaluated with free-hand strain sonoelastography using 5-9MHz linear transducer by gently compression (Antares). The strain data were converted into color scale images (elastogram colored with between red-hard to purple-soft tissues) and superimposed on B-mode images. Colored elastogram images were qualitatively evaluated by describing stiffness score ranged between 0-4 (0: no increased stiffness area-purple, 1: increased stiffness less than 25%, 2: increased stiffness area 25-50% of tumor, 3: increased stiffness 50-90% of the tumor, 4: whole lesion had increased stiffness-red). The diameter of the tumors were between 4 to 15 cm (mean: 7.5 cm). All cases had fat which was between 10-95% of the tumor. Most cases had also cystic and solid parts. Seven cases were operated whereas three were followed up.

RESULTS
Lipomatous portions of the tumors showed increased stiffness which was coded as red color (score 2) in three and (score 3-4) in seven cases. Cystic portions did not show increased stiffness (score 0). Solid portions also revealed score 2-4 increased stiffness. However, sonoelastography demonstrated no increased stiffness (score 0) in fat portion of a case with fat-fluid level. In all cases fatty portions of the teratomas were easily revealed by elastography.

CONCLUSION
Use of Sonoleastography permits differentiation of fatty portions of the teratomas from hyperechogenic normal pelvic fatty tissue and large bowel air by revealing increased stiffness of these areas, Therefore we suggest that sonoelastography should be used in cases suspected of teratoma during routine pelvic ultrasonographic examinations.
ACCURACY OF DIAGNOSIS FOR SCROTAL PATHOLOGY BY NOVICE EMERGENCY RESIDENTS IN PATIENTS WITH ACUTE SCROTUM WITH POINT-OF-CARE ULTRASOUND: COMPARISON BETWEEN PROTOCOL-BASED POINT-OF-CARE ULTRASOUND AND CONVENTIONAL ULTRASOUND

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Objectives
Ultrasound (US) is an accurate technique for the differential diagnosis of acute scrotum. This study aimed to determine the diagnostic accuracy of novice emergency medicine (EM) residents who performed point-of-care (POC) scrotal US for evaluating scrotal pathology in comparison to conventional US and to determine the most diagnostic valuable pathological findings of POC scrotal US for accurate diagnosis by novice residents.

Methods
Three novice EM residents completed a 1-day training course on the characteristics of scrotal pathologies that can be determined using POC scrotal US. They performed POC scrotal US on patients with acute scrotum to determine the presence of five pathological findings. All included patients also underwent conventional scrotal US for diagnostic confirmation. The sensitivity and specificity associated with the POC scrotal US by novice residents were calculated and receiver operating characteristic (ROC) curve analysis was performed to determine areas under curve (AUC) for the diagnoses. The diagnostic agreement between the POC US findings and the final diagnoses was assessed using Cohen’s kappa coefficient and 95% confidence intervals (CIs).

Results
A total 62 patients were included, and the overall sensitivity and specificity was 76.74% (95% CI : 61.37%–88.24%) and 78.95% (95% CI : 54.43%–93.95%), respectively. Among the five items, decreased blood flow in the testicle showed a very good agreement in terms of Cohen’s kappa (0.84). The AUC of decreased blood flow was 0.875 (95%CI:0.766–0.945) for testicular torsion. The AUC of epididymal swelling for epididymo-orchitis and epididymitis were 0.728 (95% CI : 0.600–0.833), 0.693(95% CI : 0.563-0.804), respectively..

Conclusions
Although the diagnostic accuracy of POC scrotal US of the novice residents for diagnosing scrotal pathology was moderate, testicular torsion can be detected accurately by novice when POC scrotal US revealed a decrease in testicular blood flow. Inflammations should be suspected when epididymal swelling was revealed.
ABDOMINAL SPLENOSIS: AN INFREQUENT DIAGNOSIS

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Case presentation: We report the case of an 18-year-old male with hemolytic anemia (basal Hb: 10g/dl) due to pyruvate-kinase deficit with splenectomy in childhood due to high transfusion requirements and subsequent cholecystectomy without other relevant medical history. He went to the Emergency Department for three-day-long asthenia, marked cutaneous-mucosal jaundice and abdominal discomfort. The analysis showed negativity of hepatotropic virus serologies, mixed hyperbilirubinemia of 28 mg/dl with normality of liver enzymes and an Hb of 8 g/dl. An abdominal ultrasound showed several hypoechogetic masses with an hyperechogetic centre with irregular borders, the largest of 8x4 cm, vascularised located in the left iliac fossa, so it was decided to complete the study with an abdominal-pelvic CT. At least 10 solid well-defined nodular lesions were observed in postsplenectomy bed, pararenal, infrarenal, mesenteric, left flank and pelvic areas which, given the patient's previous medical history, could be suggestive of splenosis; therefore, a study was completed with heat-denatured red blood cells labeled with technetium-99 (Tc-99) scintigraphy confirming this diagnosis.

Discussion: Splenosis is defined as the heterotopic location of splenic tissue implants in different anatomical compartments. It occurs as a consequence of splenic rupture due to trauma or in patients who have undergone therapeutic splenectomy. Splenic implants are usually multiple and may be intra or extraperitoneal and although they have an histological structure slightly different from that of the spleen, their function is similar, removing old blood cells and participating in immunity. They are usually asymptomatic although they can cause abdominal pain, intestinal obstruction, gastrointestinal bleeding or simulate neoplastic processes. Although medical history and dynamic behavior in imaging tests may guide the suspicion, the definitive diagnosis is made with scintigraphy with heat-denatured red blood cells marked with Tc-99.

Hypoechogenic mass with an hyperechogenic centre with irregular borders and vascularisation located in the left iliac fossa.
ULTRASONOGRAPHIC DIAGNOSIS OF SPONTANEOUS ENTEROHEPATIC FISTULA

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Case presentation: We report the case of an 80-year-old female with cephalic duodenopancreatectomy for pancreatic adenocarcinoma 30 years ago admitted for an intermittent two-week history of febrile peaks accompanied by nausea and mild epigastric discomfort with no travelling or epidemiological history. In the analysis, she had 11000 white blood cells with neutrophilia and elevation of fibrinogen and CRP, with no other abnormalities. An abdominal ultrasound showed a liver subcapsular collection of lenticular morphology of 30x7mm in segment 6 and, after exploring bowel with high frequency convex probe, a communication between a proximal duodenum-jejunum loop and this collection was also showed. An echo-guided PAAF of the collection was undergone with drainage of purulent material sent to cultivate with growth of E. coli, Klebsiella Pneumoniae and Bacteroides thetaiotaomicron. Broad-spectrum antibiotic therapy was initiated with favourable clinical, analytical and ultrasound evolution with decrease in abscess size and closure of the fistula. Given the good evolution with conservative measures, Surgeons ruled out intervention and the patient may be discharged in two weeks with resolution of the symptoms.

Discussion: Enteric fistulas represent abnormal, congenital or acquired, communications between the bowel and another organ, either intraabdominal or the skin. Fistulas between the bowel and solid organs are rare, with enterohepatic fistulas being an extremely infrequent type of fistula of which only three other cases have been reported in the literature. Imaging often plays a pivotal role in the diagnosis, including bowel ultrasound, as they can demonstrate the fistulous tract, however in endoscopy is not always possible identify the fistulous orifice even if it exists. Enteric fistulas should be suspected in case of recurrent abscesses, especially in diseases in which fistulization is frequent such as inflammatory bowel disease. First management approach is conservative with antibiotic administration but sometimes this is not enough and surgery is needed to solve them.
SOLITARY FIBROUS TUMOR: AN ENTITY TO CONSIDER IN THE DIAGNOSIS OF LIVER MASSES

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Case presentation: A 56-year-old female with no previous medical history admitted to hospital for abdominal tenderness and palpable mass with completely normal analysis. An abdominal ultrasound was performed which identified in the left hepatic lobe in the confluence between cava and left and median hepatic veins a well-defined hyperechogenic lesion of 11x9x4cm, with multiple anechogenic and nodular areas and thick septa inside. After contrast administration it showed a nonspecific pattern with hypercaptation of septa and nodular areas with hypocaptation of the anechogenic-ones in arterial phase with progressive washout in portal/late phase. An eco-guided-PAAF didn’t show malignancy. Finally, after abdominal CT that ruled out disease beyond the hepatic parenchyma and taking into account compressive symptoms, the case was presented in a multidisciplinary committee, opting for surgical resection. The anatomopathological study of the lesion showed a solitary fibrous tumor (SFT) depending on the hepatic capsule with no signs of malignant transformation.

Discussion: SFT is an infrequent mesenchymal neoplasm, more prevalent in middle-aged women (2:1), with isolated cases of appearance in liver parenchyma reported in the literature and none of them diagnosed by contrast ultrasound. Despite its low incidence, it should be considered in the differential diagnosis of hepatic masses since in most cases they behave as big, well-defined and heterogeneous single lesions, especially in the right hepatic lobe. Typical radiological features are not always present and except in some cases where it may cause hypoglycemia (due to IGF-2 production), laboratory tests, including tumor markers, are usually not altered. The diagnostic certainty is provided by anatomopathological and immunohistochemical study: immunoreactivity for CD34, vimentin and bcl-2, without expression of cytokeratins or S-100. Although most of them are benign tumors of progressive growth, the treatment of choice is surgical resection with free-margins which in turn is the most important prognostic factor along with pathological findings and tumor size.

Hyperechogenic lesion of 11x9x4cm, with multiple anechogenic and nodular areas and thick septa inside.
DIAGNÓSTICO ECOGRÁFICO DE HEMATOMA INTRAVESICULAR TRAS IMPLANTACIÓN DE TIPS  
(DERIVACIÓN TRANSYUGULAR INTRAHEPATICA PORTOSISTEMICA)

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CASO CLÍNICO
Presentamos el caso de un varón de 48 años, con cirrosis por VHC sin descompensaciones previas, que ingresó en diciembre de 2018 por un infarto agudo de miocardio en el contexto de un primer episodio de hemorragia digestiva alta por varices esofágicas, siendo tratado con ligadura con bandas y posterior angioplastia con colocación de stent. Se realizó además un angioTC abdominal observándose trombosis portal extensa. El paciente presentó buena evolución posterior, iniciándose tratamiento antiagregante con ácido acetil salicílico y anticoagulante con enoxaparina sin incidencias. Un mes después volvió a presentar un nuevo episodio de hemorragia variceal, decidiéndose colocación de TIPS. El procedimiento fue complejo, implantándose finalmente el dispositivo tras numerosos intentos. Al día siguiente el paciente comenzó con cuadro de dolor abdominal y anemización significativa, sin exteriorización de sangrado. Se realizó entonces ecografía abdominal con contraste intravenoso hallándose una masa heterogénea intravesicular de 47 mm de diámetro máximo sin captación de contraste, compatible con hematoma. Ante la estabilidad clínica y hemodinámica del paciente se decidió manejo conservador, realizándose control ecográfico pasados 5 días, evidenciando crecimiento del hematoma intravesicular respecto a la ecografía previa pero persistiendo ausencia de captación de contraste, por lo que se mantuvo actitud conservadora al no impresionar de sangrado activo. En el seguimiento ecográfico posterior se confirmó progresiva resolución del hematoma.

DISCUSIÓN
El desarrollo de hematoma intravesicular tras la implantación de un TIPS es una complicación altamente infrecuente. Aunque en ocasiones dicho sangrado conlleva extrema gravedad, precisando intervención quirúrgica urgente, en la mayoría de los casos la hemorragia puede ser manejada de manera conservadora, con seguimiento radiológico estrecho. La ecografía con contraste es una herramienta fundamental en la valoración de las diferentes complicaciones que pueden surgir tras la implantación de un TIPS, siendo útil tanto para su diagnóstico como durante el seguimiento.

Figura 1. Ecografía abdominal con contraste (SonoVue®): 
A. Se evidencia presencia de una masa heterogénea intravesicular de 74.4 mm de diámetro máximo, que ocupa casi la totalidad de la luz de la vesícula biliar.
B. Al emplear contraste se confirma la ausencia de captación de la masa intravesicular, lo que apoya el diagnóstico de hematoma y sugiere ausencia de sangrado activo.

Poster presentations
EPILOIC APPENDAGITIS: A RARE CASE OF ACUTE ABDOMINAL PAIN.

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Epiploic appendages are normal outpouchings of peritoneal fat on the anti-mesenteric surface of the colon, are 1 to 2 cm thick and 2 to 5 cm long. Each appendage encloses small branches of the circular artery and vein that supply the corresponding segment of the colon.

Epiploic appendagitis is a benign and self-limited condition. It is an inflammatory process and most commonly present with acute or subacute onset of lower abdominal pain. Its diagnosis is rarely clinical because it is an infrequent entity, it is usually a radiological or surgical in the context of the differential diagnosis of entities such as acute appendicitis, diverticulitis, cholecystitis. The treatment is only symptomatic.

Case:
A 71 male self-present who attended for an abdominal ultrasound due to acute abdominal pain in left lower quadrant in the last 3 days. In the ultrasound we observed a hyperechoic oval lesion, about 48 x 18 mm, non-compressible, adjacent to the colon, but finding this respected, with the wall of normal thickness, without inflammatory process data. Afterwards, the patient is evaluated by the emergency doctor. Physical examination strictly normal except for pain on deep palpation in FL without signs of peritoneal irritation. Normal analytics. CT to confirm ultrasound diagnosis: discrete increase in fat density in segment adjacent to the descending colon in FL, which seems compatible with omental inflammatory process or epiploic appendagitis. The patient was discharged with symptomatic treatment and his evolution was satisfactory being asymptomatic at 4 days.

Conclusion: Epiploic appendagitis is a rare entity that causes acute abdominal pain. Knowing this pathology can lead to an accurate diagnosis with ultrasound and avoid unnecessary diagnostic tests and treatment for the patient.
Cutaneous and subcutaneous lesions are a common reason for consulting primary care physicians. Patients are usually worried about these lesions because they are very accessible. Ultrasound imaging is increasingly being used in the noninvasive evaluation of various cutaneous diseases, playing a complimentary role to physical examination. US is a cheap and available technique and provides important information. Radiologists are able to help specialists to carry out a reliable examination. US reduces invasive procedures like biopsies and fine needle aspirations and it works when lesions are too small to be evaluated on CT or MRI.

Our goals are to bring into light the imaging findings of normal skin and the features of some cutaneous and subcutaneous lesions and the management of various dermatological conditions.

US gives important information about cutaneous and subcutaneous lesions, making easier the diagnosis and complete physical examination. Radiologists and specialists as dermatologists have to work together to give the best care to the patients.
SPECTRAL DOPPLER ULTRASOUND: AN EASY WAY TO DIAGNOSE, DEMONSTRATE AND SUPPORT, CHRONIC ANTERIOR EXERTIONAL COMPARTMENT SYNDROME DIAGNOSIS.

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Introduction:
Chronic anterior exertional compartment syndrome (CAECS) originates from a reduction in the aponeurosis elasticity of the anterior compartment of the leg, which faced with an increased muscle volume caused by exercise, augments the compartment pressure, impeding an adequate arteriolar dilation. This pathology use to have more incidence in people that changes drastically their training intensity, i.e. new recruits and cadets as well as amateur athletes with change of training protocols.
Currently the CAECS is almost only diagnose clinically. The traditional way to demonstrate this pathology is by either directly measuring the intracompartmental pressure or using magnetic resonance imagining before and after exercise. Considering that both techniques are barely accessible, complex and even invasive, we propose diagnosing and evaluating with spectral Doppler, measuring changes in vascular resistance at the distal third of the anterior tibial artery (ATA) before and after exercise.

Materials and Methods:
Shown are 19 cases derived to a bilateral Doppler study with clinical suspicion of CAECS. We obtained spectral curves at rest and post exercise until the induction of pain, from the ATA’s, as well as from popliteals, posterior tibiales and fibulares arteries, these latter to be use as controls.

Results:
In 78.9 % of the studied legs, a significant increase of the vascular resistance was observed after exercise in the ATA. A 10.5 % of the legs resulted negative and in a similar percentage led us to the diagnosis of other pathological conditions as etiological cause.

Conclusions:
The spectral doppler pre and post exercise of the ATA is a noninvasive diagnostic method, that is very sensitive, economical and reliable for the evaluation of CAECS. In only 10.5% of the studied limbs, it wasn´t possible to diagnose a CAECS or other pathological condition.
DISCREPANCIA ENTRE ECOGRAFÍA Y TC EN EL DIAGNÓSTICO DE LESIÓN QUÍSTICA HEPÁTICA COMPLEJA.

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Introducción:
Los cistoadenomas constituyen del 1 al 5% de los quistes hepáticos. Aunque infrecuente, el cistoadenoma es la forma más común de neoplasia primaria quística hepática.

Caso clínico:
Varón de 77 años que consulta por clínica de mareo y bradicardia. En ecocardiograma se identifica LOE hepática incidental de 6x6cm. Se remite a Gastroenterología, realizándose ecografía abdominal, que describe LOE hipoecogénica en lóbulo hepático izquierdo de 14cm con contenido en su interior e imagen proliferativa de sus paredes. En TC abdominal, es valorado de quiste simple. Se solicita serología de echinococcus (negativa) y CA19-9 y CEA que son normales. Se revisa un año después manteniéndose la discrepancia entre ecografía y TC. Al elevarse CA19-9 (369IU/mL) se remite a Cirugía General para valorar intervención quirúrgica, se realiza RMN que clasifica la lesión como cistoadenoma hepático como primera posibilidad. Debido a esto, el paciente se encuentra pendiente de cirugía.

Discusión:
Los cistoadenomas biliares son benignos, pero se consideran precursores del cistoadenocarcinoma. Aunque habitualmente son asintomáticos y se descubren de forma incidental en pruebas de imagen, pueden producir clínica por compresión. El diagnóstico se lleva a cabo mediante pruebas de imagen. En ecografía, suele describirse una lesión hipoecoica con contenido, engrosamiento de paredes y tabiques. En TC es típico el engrosamiento capsular con realce, y septos. En la RMN se encuentran hallazgos superponibles a lo anterior, con contenido mucinoso que puede realzar en T2. Normalmente, se emplea la ecografía para el diagnóstico inicial, completándose el estudio con otra prueba radiológica. En nuestro paciente, ecografía y TC describían diferentes hallazgos, algo poco habitual. No está recomendada la biopsia por posibilidad de diseminación en caso de cistoadenocarcinoma. El tratamiento definitivo es la cirugía.

Figuras:
- Imagen en ecografía de seguimiento: lesión de 12cm con contenido heterogéneo sólido-líquido.
1. **Imagen de TC durante el seguimiento:** aparente imagen de quiste de características simples sin captación de contraste.

2. **Imagen de RMN diagnóstica,** en secuencia T2. Lesión de aspecto heterogéneo, multiloculado con varios septos hipointensos en su interior y contenido hiperintenso.
ABDOMINAL MASS IN PATIENT WITH DISCONTINUE ABDOMINAL PAIN

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Introduction: Intestinal lipomas are very rare, usually asymptomatic and the diagnosis is made incidentally. 75% of the lipomas greater than 4 cm are symptomatic causing abdominal pain, rectal bleeding, obstruction and exceptionally intestinal intussusception.

Clinical case: A 52-year-old patient with no relevant medical history who consulted for lumbar pain accompanied by abdominal pain with a subocclusive profile in the last month. In the abdominal examination abdominal masses at the level of mesogastrium and right iliac fossa are highlighted. Normal blood test, including tumor markers. Abdominal ultrasound was performed in which a homogenous hyperechogenic solid mass was observed, which is dependent on the large intestine and also presented a typical "Donuts" image (Figure 1), which could correspond to the intestinal invagination of intestinal wall-dependent lesion as a first option. Abdominal CT was performed confirming a 7.5 cm lesion with fat density compatible with giant intestinal lipoma as the first diagnostic option that produces invagination of the transverse colon (Figure 2).

Discussion: Lipoma is a rare tumor of benign behavior of the digestive tract. The diagnosis of intussusception in adults is very difficult since the symptoms are very variable and atypical. A high clinical suspicion together with an abdominal CT scan are useful tools for an early diagnosis. Surgical resection is the treatment of choice and has an excellent prognosis. In our case, the high clinical suspicion and abdominal ultrasound where the intussusception was aimed was the one that led us to suspect the diagnosis and helped us to focus on the patient arriving at a diagnosis of certainty in an early way.
FIGURE 1. Large intestine-dependent mass that causes intestinal intussusception at the level of transverse colon.

FIGURE 2. Giant intestinal lipoma produces invagination of the transverse colon.
CASO CLÍNICO

Paciente de 72 años con antecedentes personales de hipertensión arterial, diabetes mellitus tipo 2 y cirrosis hepática de origen etanólico. Acude a urgencias de su hospital por cuadro de dolor abdominal agudo, detectándose anemización con Hb 7.8 gr/dl, por lo que se trasfunden dos concentrados de hematíes y se traslada a nuestro hospital para realización de gastroscopia urgente. A su llegada, se realiza análisis con Hb 8gr/dl, sin evidencia de hemorragia digestiva, por lo que se realiza ecografía digestiva. Se aprecia ascitis de distribución típica pero ecogénica (fotos 3y4), datos de hepatopatía crónica con hipertensión portal y una LOE en s.III de 55x45mm (foto 1), con patrón doppler en canasta, signo de nódulo sobre nódulo, que impronta la superficie hepática, junto con otra LOE hiperecogénica en s.V de 1cm. Se realiza contraste ecográfico apreciando un patrón compatible con CHC (LR-5) (foto 2). Se procede a paracentesis diagnóstica obteniendo líquido hemático sugestivo de hemoperitoneo. Un AngioTC confirma los hallazgos ecográficos, alta sospecha de hemoperitoneo y un hematoma adyacente a la superficie hepática a nivel de la LOE descrita en s.III. Se procede a manejo conservador inicial mediante soporte hemodinámico con fluidoterapia y trasfusión de 2 concentrados de hematíes, realizando posteriormente quimioembolización del hepatocarcinoma sangrante, consiguiendo estabilización de las cifras de hemoglobina y buena evolución posterior.

DISCUSIÓN

El hemoperitoneo supone un modo excepcional de presentación del CHC, si bien puede explicarse por una localización y crecimiento subcapsular y su naturaleza hipervascular. El modo de presentación más frecuente es el dolor abdominal agudo con líquido libre intraabdominal, anemización sin exteriorización de sangrado. Son herramientas diagnósticas la ecografía (el uso de contraste puede optimizar el estudio), el angioTC y la paracentesis diagnóstica. El tratamiento de elección es la embolización de la arteria nutricia mediante arteriografía y, si no es posible, cirugía.
Poster presentations

Foto 1

Foto 3

Foto 4
Caso Clínico

Paciente de 53 años con único antecedente de interés en consumo esporádico de AINES, que es remitido por traumatólogo para ecografía abdominal por dorsalgia irradiada a epigastrio de dos semanas de evolución, en tratamiento con dexketoprofeno durante la semana previa.

En ecografía digestiva se evidencian 2 LOES compatibles con hemangiomas típicos, destacando un engrosamiento mural del cuerpo gástrico con una nodulación hipoecogénica de 25mm. Dado el hallazgo y, ante la sospecha de patología ulcerosa o neoplásica gástrica, se realiza gastroscopia que evidencia úlcera de unos 3cm de tamaño, excavada, de fondo fibrinado y bordes sobreelevados lisos, sita en incisura angularis. Se toman biopsias, se inicia tratamiento con esomeprazol y se solicita TAC abdominal. Las biopsias son negativas para malignidad, con positividad para Helicobacter pylori, por lo que se añade tratamiento erradicador. El TAC informa de engrosamiento de la pared gástrica de cuerpo en curvadura menor con lesión de 15mm sugestiva de neoplasia. Se plantea revisión endoscópica en un mes, tras tratamiento erradicador y antisecretor intensivo. La gastroscopia de control muestra una resolución casi completa de la úlcera con biopsias informadas como tejido de granulación y cambios epiteliales regenerativos.

Discusión.

La detección ecográfica de engrosamiento de la pared gástrica (entendida >10mm) y la imagen en “pseudorriñón”, traducen la presencia de patología tanto inflamatoria como tumoral con alta sensibilidad pero baja especificidad.

En la úlcera gástrica puede identificarse engrosamiento de la pared gástrica por actividad inflamatoria acompañante, área hipoecogénica correspondiente al cráter ulceroso y nodulación ecogénica en su interior. Las lesiones ulcerosas son de difícil diagnóstico ecográfico dependiendo su detección de criterios de tamaño (>20mm), localización en antro-incisura y transmisión óptima de ultrasonidos.

En nuestro caso, la detección ecográfica de los hallazgos descritos, permitió un diagnóstico rápido de patología ulcerosa, evitando complicaciones mayores como hemorragia digestiva o perforación.
**Foto ecografía 1:** Engrosamiento de la pared de cuerpo gástrico.

**Foto ecografía 2:** Nodulación hipoecogénica pared cuerpo-antro de 25mm.
**Foto endoscopia 1:** úlcera excavada y fondo fibrinado de 3cm en incisura angularis.

**Foto endoscopia 2:** lesión ulcerosa en cicatrización y parcial resolución un mes después del diagnóstico.
HEMORRAGIA DIGESTIVA DE CAUSA INCIERTA: PAPEL CLAVE DE LA ECOGRAFÍA

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CASO CLÍNICO
Varón de 56 años diagnosticado de Diabetes Mellitus tipo II, acude a urgencias por astenia, pérdida de peso, dolor abdominal de un mes de evolución y presíncope con heces negras. Presenta palidez, taquicardia y dolor en epigastrio, con Hb 4.5 g/dl. Se realiza gastroscopia urgente detectando abundantes restos hemáticos y sólidos alimenticios sin poder objetivar lesión causante del sangrado. En la mañana siguiente al ingreso, se realiza ecografía digestiva que evidencia masa heterogénea y bien vascularizada, de 10x8cm en cola de páncreas (imagen 1), en contacto con cámara gástrica, con aparente infiltración de la pared de cuerpo-fundus (imagen 2), con presencia de adenopatías neoplásicas en hilio hepático y área celíaca (imagen 3). Se procede a nueva gastroscopia con engrosamiento de pliegues con aspecto infiltrativo en fundus y cuerpo alto sin sangrado, tomándose biopsias. Se realiza TC abdominal como estudio de extensión apoyando los hallazgos descritos por la ecografía (imágenes 4 y 5). Ante la negatividad de las biopsias gástricas para malignidad, se decide PAAF ecoguiada de la masa, resultando tumor neuroendocrino moderadamente diferenciado. Se decide cirugía realizando pancreatectomía corporocaudal con esplenectomía y esofagogastrostomía, con resección de adenopatías. Se planifica tratamiento por oncología.

DISCUSIÓN
Los tumores neuroendocrinos son poco frecuentes, representan menos del 5% de las neoplasias pancreáticas. En aquellos no funcionantes, el diagnóstico suele ser incidental o tardío como complicación evolutiva, como ocurre en nuestro caso. El único tratamiento definitivo es el quirúrgico, mientras que los análogos de somatostatina consiguen control de síntomas y progresión.

En el caso de los tumores neuroendocrinos, la ecografía permite su detección, la valoración de su naturaleza generalmente hipervascular mediante doppler y contraste y la punción ecoguiada. Además, permite hacer estudio de extensión en el mismo acto, detectando adenopatías y descartando metástasis hepáticas. Concretamente en nuestro caso, la ecografía constituyó el pilar diagnóstico.
Imagen 1: Masa heterogénea en cola de páncreas con realce doppler

Imagen 2: Masa sin solución continuidad con pared gástrica
Imagen 3: Adenopatías neoplásicas en hilio hepático

Imágenes 4 y 5: TC de abdomen, reconstrucciones axial y coronal. Masa de densidad heterogénea junto a la cola del páncreas, con áreas de realce y necrosis. Se acompaña de algunas adenopatías peripancreáticas.
MUSCULOSKELETAL ULTRASOUND PHANTOM DEVELOPED WITH 3D PRINTING FOR INTERVENTIONAL PROCEDURES TRAINING

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Objective
The aim of this project was to create a sonographic phantom model of three different anatomic regions that were accurate in bone configuration. Its main objective was to improve the quality of training in the management of ultrasound-guided techniques and minimally invasive surgery for the treatment of musculoskeletal pathologies.

Material and Methods
The anatomic bone models were obtained from a CT scan and rendered in the computer into a STL file with Osirix MD 7.5 and Meshmixer 3.4.35 software for finally be 3-dimensionally printed with an Ultimaker 3 Extended printer in PLA material. This model was embedded in an opaque gelatin compound to block the visualization of the needle and set in a anatomic-shaped mold.

Results
The models were effective in simulating the bony anatomy because of the validation of the anatomic 3D printed models which are suitable for surgery training as shown in the literature ¹. Finally sonographic images of the phantoms are shown compared to sonographic human anatomic images, observing very few differences.


Conclusion
Phantom models made with 3D printing are reliable for interventional procedures as the 3D printed model mimics the bone surface having a satisfactory sonographic appearance. These models also reproduce the bone lesions observed in the CT scan so it can be scanned in the phantom models. Further studies are necessary for evaluating the skills improvement with these phantoms.
UTILIDAD DE LA ECOGRAFÍA ABDOMINAL EN EL DIAGNÓSTICO DE NEOPLASIA GÁSTRICA OBSTRUCTIVA

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Caso clínico:
Los tumores gástricos localizados en la región prepilórica, suelen presentar síntomas obstructivos, incluso los de pequeño tamaño. Ello contribuye a que en muchas ocasiones sea difícil la valoración de la lesión por endoscopia al estar ocupada la cavidad gástrica por contenido gástrico, conllevando a repetición exploraciones, demora en el diagnóstico o riesgo de aspiración del contenido gástrico.

La ecografía abdominal se ha mostrado sensible en el diagnóstico del cáncer gástrico al permitir la diferenciación de las capas de la pared del estómago, especialmente del antro y el cuerpo del estómago.

Varón de 50 años, con cuadro de vómitos y pérdida de peso de 3 meses de evolución. Ecografía abdominal objetiva cavidad gástrica muy distendida ocupada por gran cantidad de contenido líquido y sólido, con engrosamiento y pérdida de la estructura de capas en antro. Se evidencias múltiples lesiones ocupantes de espacio (LOES) hepáticas en “ojo de buey” sugestivas de metástasis hepáticas. Dado que el paciente se iba a realizar gastroscopia inmediatamente tras ésta, se decidió colocar sonda nasogástrica (SNG) para evacuar el contenido gástrico.

Previo a la realización de la endoscopia se comprobó la ausencia de contenido gástrico por ecografía, pudiéndose de esta forma, realizar gastroscopia de forma segura con sedación profunda. En ella se observó una lesión ulcerada en antro gástrico que estenosaba la luz pilórica sugestiva de neoplasia gástrica, confirmándose el diagnóstico de adenocarcinoma gástrico por histología.

Discusión:
La combinación de ecografía, evacuación con SNG y endoscopia permitió el diagnóstico del paciente en el mismo día, sin necesidad de repetición de exploraciones, demora en el diagnóstico y evitando complicaciones como la aspiración del contenido gástrico.
ULTRASOUND FINDINGS IN THE ABDOMINAL CRISIS OF THE HEREDITARY ANGIOEDEMA

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Objectives
Hereditary Angioedema (HAE) is a rare autosomal-dominant disease caused by serum C1 inhibitor deficiency. This deficiency leads to an up-regulation of complement, activating the bradykinin pathway and causing vascular permeability and subsequent mucosal edema. Abdominal angioedema is a less recognized type of angioedema and the clinical signs may range from subtle, diffuse abdominal pain and nausea, to overt peritonitis. We describe one case of abdominal angioedema in a patient with known HAE that were diagnosed by ultrasound.

Methods
35 year-old male patient with personal history of HAE. He goes to allergy consultation due to diffuse abdominal pain and abdominal guarding with incohercible vomiting. He then is referred to our unit to perform an urgent ultrasound (US).

Results
On US examination a jejunal segment is identified with wall-thickening and mucosal oedema (Kerking folds-FIGURE 1) associated with moderate ascites, compatible with the clinical suspicion of a HAE abdominal crisis.

Conclusions.
There are few reported cases in the literature describing the ultrasonographic findings and the utility of US in abdominal crisis in these patients. In abdominal HAE, edema in the bowel wall causes fluid to accumulate in the peritoneum, leading to abdominal pain and nausea, and making the diagnosis of HAE possible with ultrasound. Risk stratifying these patients early in their clinical course allows for early treatment of what can be a life-threatening presentation. Because of the recurrent nature of abdominal HAE, the use of abdominal ultrasound may be able to reduce cumulative ionizing radiation exposure from repeated CT
MANEJO DE LOES HEPÁTICAS EN UNA UNIDAD DE ECOGRAFÍA DIGESTIVA


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INTRODUCCIÓN:
Las Unidades de Ecografía Digestiva (UED) aportan una visión clínica a la ecografía abdominal, sin embargo no están implantadas en la mayoría de Servicios de Digestivo españoles. Nuestro objetivo es describir el manejo de las LOEs hepáticas por las UED y además compararlo con otros centros sin éstas.

MATERIAL Y MÉTODOS:
Se llevó a cabo un estudio descriptivo multicéntrico con participación de cuatros hospitales con UED (La Paz, 12 de Octubre, Virgen de la Arrixaca, CH de Toledo) recogiendo información sobre el manejo de las LOEs hepáticas detectadas consecutivamente. Se excluyeron las lesiones quísticas simples. Por otro lado, retrospectivamente se recopiló la misma información de lesiones con diagnóstico de novo de carcinoma hepatocelular (CHC) de dos centros sin UED (Alicante y Málaga)

RESULTADOS:
En las UED se detectaron 94 LOEs, 89% (84/94) con diagnóstico definitivo (37% angiomas; 9% HNF; 9% metástasis; 14% CHC) y 11% (10/84) indeterminadas. El 60% (51/84) se diagnosticaron mediante ecografía abdominal sin precisar de otra técnica de imagen. Los métodos ecográficos empleados fueron: CEUS 83%, Doppler 39%, y PAAF 13%. El 39% (33/84) precisó otra técnica de imagen (34% TAC, 14% RMN), mayoritariamente por estudio de extensión (30%). Tan sólo en 8% (7/84) de las ecografías no fueron concluyentes. El tiempo hasta completar el diagnóstico fue de media 14 días (DE:47, 0-365).

Se recogieron los datos de 35 CHC en centros sin UED (vs 14 con UED). Los métodos ecográficos fueron: CEUS 0% (vs 85%); Doppler 5% (vs 35%), PAAF ecoguiada 8% (vs 21%). La ecografía no fue concluyen en el 82% (vs 7.1%). El tiempo diagnóstico fue de media 29 días (DE:39; Med:14, 1-150) vs 19 días (DE:12; Med:17, 5-45) con UED.

CONCLUSIONES:
Las UED logran el diagnóstico de las LOEs hepáticas en una alta proporción y breve periodo de tiempo. Sería adecuado expandir estas unidades a más centros.
VALOR DEL CEUS EN EL DIAGNÓSTICO DEL COLANGIOCARCINOMA: A PROPÓSITO DE UN CASO

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CASO CLÍNICO
Mujer de 63 años con antecedente de hepatopatía crónica por VHC en tratamiento, ingresa por dolor abdominal y pérdida de peso de 3 meses de evolución. En urgencias, se realiza ecografía que informa de hepatopatía crónica, ascitis leve y colelitiasis. Ya en planta, destacan analíticamente CEA 13,1 y Ca 19.9 381. Por ello, se solicita RMN hepática con contraste intravenoso, en la cual se observa un hígado de bordes irregulares con alteraciones de la señal de carácter pseudonodular así como zonas de hipoperfusión en zona de s. V, pero sin detectarse lesiones de sospecha de neoplasia.

Ante la mala evolución, se solicita ecografía digestiva en la que se aprecia una hepatopatía crónica, con una LOE isoecogénica heterogénea, mal definida, de 42x38 mm en segmento V. Con contraste ecográfico la lesión muestra en fase arterial captación intensa incompleta, con lavado a partir de los 50 segundos, planteando la posibilidad de un colangiocarcinoma intrahepático. Finalmente, una PAAF confirmó el diagnóstico de adenocarcinoma moderadamente diferenciado compatible con colangiocarcinoma.

DISCUSIÓN
El colangiocarcinoma intrahepático puede ser identificado ecográficamente como una LOE iso o hipoecogénica con dilatación de radicales biliares por afectación o retracción.
La colangiorresonancia, es considerada el estudio diagnóstico de elección para el colangiocarcinoma, por su elevada sensibilidad y especificidad. El colangiocarcinoma intrahepático aparece como una lesión hipodensa en T1 e hiperintensa en T2 y con concentración del medio de contraste en el tumor en las imágenes tardías. En los casos de colangiocarcinoma intrahepático, lesiones entre 2-4 cm pueden pasar desapercibidos y confundirse con parénquima hepático normal en la colangioRMN dinámica; mientras que aquellos de tamaño superior podrían ser clasificados como hepatocarcinoma, por lo que en estos casos la ecografía con contraste cobra una gran relevancia, por el patrón de comportamiento del colangiocarcinoma y por el apoyo a la punción-biopsia.
Foto ecografía 1. LOE hepática en s.V, isoeucogénica, heterogénea, mal definida.

Foto ecografía 2. LOE hepática en fase portal de CEUS.

Foto ecografía 3. LOE hepática en fase venosa de CEUS.
THE VALUE OF COLOR DOPPLER ULTRASOUND OF RENAL ARTERIES IN PATIENTS WITH NEPHROPATHY, THE FOCUS IN RI COMPONENT

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OBJECTIVE AND PURPOSE: To evaluate with color Doppler ultrasound the renal arteries hemodynamic in patients with arterial hypertension and nephropathy providing sufficient evidence that screening with ultrasound with color Doppler of renal arteries is a valid alternative assessment in these patients. With the mission to prove that in some cases, since ultrasound with color Doppler of renal arteries is an examination with high reliability, it can replace CTA in making the diagnosis. In its way, it crystallizes the vision that ultrasound with color Doppler should be part of the protocol of examinations for the diagnosis and follow up of patients with nephropathy, especially in specific categories where CTA cannot be performed.

MATERIAL AND METHODS: The study form is transversal and it has considered all admitted cases to the Regional Hospital for the period March 2010 - September 2015 with clinical diagnosis of arterial hypertension. A total of 233 cases were examined with ultrasound. For the examination were used two machines ALOKA SSD - 1700, Sonoline SIEMENS S40. All patients were examined in the morning, fasting, from 8 am to 9 am, after a break of about 15 minutes after they arrived in the cabinet of ultrasound. Patients were initially assessed on B mode. Then were identified the integrity of the aorta and renal arteries origin. Doppler color is used to identify the origin of the renal arteries when it was not possible using mode B. Spectral analysis is done only with Doppler in all cases when patients had difficulty to keep up the respiration. In other cases it is also used color Doppler. All patients were evaluated for the presence or absence of stenosis using as well as the direct and indirect method. The average time of examination of patients was about 40 minutes. During ultrasound exams patients were evaluated for peak systolic velocity (PSV), aorto – renal ratio of PSV (RAR), the presence or not of turbulence, the presence or not of the tardus parvus wave, for differences of longitudinal diameters among the kidneys (DIF d / s) and for vascular resistance index (RI) in the renal artery and its intrarenal branches, this is the study component that we are analyzing in this article.

In all examined patients with a value of creatinine greater than 1.3 mg / dl were 115 ones who were divided into two groups in terms of the value of creatininemia level 1.4 - 2.2 mg / dl and> 2.2 mg / dl.
RESULTS: In examined patients, those with a value of creatininemia greater than 1.3 mg / dl had values of RI0.7 - 0.8 in 59 cases from 74 patients with creatininemia value 1.4 - 2.2 mg / dl and value of RI >0.8 in 39 cases from the 41 patients with creatininemia value > 2.2 mg / dl.

While the correlation between the blood level of creatininemia and value of RI noted that the correlation between them is strong in cases with ischemic nephropathy with strong statistical significance.

CONCLUSIONS: In this study, ultrasound resulted as a method with high sensitivity and specificity for the diagnosis of ischemic nephropathy. The indirect method was more effective because it is shorter and it takes into consideration parameters that are assessed and detected even in conditions where patients did not cooperate properly. Analyzing and assessing the value of RI had proven to be very valuable for assessment of ischemic nephropathy since the value of the coefficient of correlation indicates a very strong connection with creatininemi level as gold standard for evaluation of nephropathy, which is synchronous with the literature.

KEY WORDS: resistance index (RI), tardus parvus, peak systolic velocity, renal artery stenosis, Doppler-SPECIALITY: Imaging
PERCUTANEOUS ETHANOL INJECTION (PEI) ABLATION ULTRASOUND-GUIDED OF HEPATOCELLULAR CARCINOMA (HCC). A UNICENTRIC EXPERIENCE.

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Introduction
HCC is a leading cause of death in cirrhosis. Early diagnosis allows curative treatments as transplantation, resection and local ablation. Radiofrequency and PEI are the most common ablative therapies. Although with conflicting results, PEI and radiofrequency can be equally effective in terms of survival when treating single HCCs smaller than 2-3 cm, with better applicability, security and cost of PEI.

Material and methods
Retrospective analysis, 42 consecutive patients with HCC treated with PEI (November 2009-March 2018). Database included demographic, clinical, ablative treatment and survival variables. Ablation’s effectiveness was assessed 1 month later and further treatment was scheduled if necessary trying complete necrosis (dynamic MRI/CT). Data processing and analysis were carried out using STATA (StatCorp LLC, TX, USA).

Results
Twenty-four (57.1%) men, median age 75.5 years (range: 54-86), cirrhosis 42 (95.2%), Child-Pugh-A 35 (83.3%), MELD score ≤ 10 41 (97.7%). Etiology: HCV 25 (59.5%), alcohol 6 (14.2%), HCV+alcohol 5 (11.9%). ASA class III 35 (83.3%).
HCC detection: US 37 (88.1%), MRI 4 (9.5%) and CT 1 (2.3%); confirmation: MRI 42 (80.9%), CT (16.6%), biopsy (2.3%). BCLC stage: BCLC-A 30 (71.4%), BCLC-0 9 (21.4%), BCLC-B 3 (7.1%). Main nodule’s mean size: 18.5mm (range: 8-38). Mean dose ethanol: 14.2ml (range: 5-24). Thirty-nine (95.2%) patients were discharged during 24 hours after procedure. Morbidity: 2 (4.8%) adverse events, 1 (2.4%) death.
One month response: complete 11 (26.1%), partial 17 (40.4%), no response 12 (28.5%). Final response: complete 13 (56.5%), partial 5 (21.7%), no response 5 (21.7%). Survival rate at 1, 3 and 5 years: 37/42 (88.1%), 16/33 (48.4%) and 7/31 (22.5%). Patients with complete response obtained better 1-year survival (p=0.01), but not at 3 and 5 years.

Conclusions
PEI is an effective treatment in HCC, even in elderly patients with comorbidity. Recovery after the procedure is fast, not affecting the functionality of this population. A complete response increased 1-year survival.
SHOULD ABDOMINAL US REPLACE ABDOMINAL XRAY AS THE INITIAL IMAGING EXAMINATION IN THE PEDIATRIC PATIENT WITH ABDOMINAL PAIN?

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PURPOSE:
To determine the value of abdominal radiography and ultrasound (US) in the diagnosis of acute abdominal pain in children beyond the neonatal period by comparing the findings of plain films with those of US. Final diagnosis was based on surgical findings, enema and/or clinical follow-up

METHODS AND MATERIALS:
During a 3-year period, 1204 abdominal radiographs of children between the ages of 2 months to 14 years were prospectively analyzed. In 550 of these patients abdominal US was also available. All children with suspected appendicitis or intussusception underwent ultrasound evaluation to confirm diagnosis and evaluate perforation prior to surgery. Radiological findings were classified as normal, non-specific and abnormal (pneumoperitoneum, bowel obstruction, ileus, fecaliths, target sign, mass effect, urolithiasis and gallstones)

RESULTS:
Radiographs of the abdomen were negative in 709 patients, non-specific in 409 and abnormal in 86 children.
224/550 abdominal US showed pathological findings. In those cases, plain radiography was interpreted as negative in 49.5% and abnormal in 32.5%. Pneumoperitoneum was never identified. 98/550 children underwent surgery, of which 44.8% showed negative radiography. Appendicitis (87) and ileocolic intussusceptions (54) were the most frequent findings. In the appendicitis group 14.9% had fecaliths. Only 66% of ileocecal intussusceptions had abnormal plain films

CONCLUSION:
Appendicitis and intussusception were the most frequently diagnosed pathologies. Only 14.9% of appendicitis showed underlying specific plain film abnormalities. No signs of free air were detected in plain radiograph. Most intestinal obstructions were caused by appendicitis and intussusceptions. At our institution, US has replaced plain radiography as the initial imaging modality for accurate diagnosis of acute non-traumatic pain in children
Introducción
La tuberculosis (TBC) presenta un espectro clínico variado. La forma clásica es la pulmonar, aunque puede afectar a otros órganos hasta en un 25% de los pacientes. Las formas de presentación extrapulmonar, incluida la hepática, representan un reto diagnóstico, puesto que la clínica es muy inespecífica. Presentamos dos casos de TBC hepática en los que la ecografía abdominal (EA) ayudó al diagnóstico.

Caso clínico:
Caso 1: varón de 50 años con colitis ulcerosa en tratamiento con Adalimumab, estudiado por hepatitis aguda ictérica de etiología incierta. La EA mostraba hepatomegalia hiperecogénica de contorno liso y ecoestructura homogénea (Imagen 1 y 2). Se descartó patología biliar mediante colangioRM. Se realizó biopsia hepática guiada por ecografía que permitió alcanzar el diagnóstico de TBC hepática.

Caso 2: mujer de 38 años diagnosticada de Enfermedad de Crohn (EC) en tratamiento con Adalimumab. Ingresa por TBC pulmonar extensa. Tras el inicio del tratamiento antituberculoso se solicitó ecografía intestinal para valorar la EC. De forma incidental se visualizaron incontables lesiones hepáticas hipoecogénicas de borde hiperecogénico y contorno geográfico, menores de 3cm. Se realizó estudio con contraste intravenoso (SonoVue) identificando hipercaptación periférica en fase arterial con tabiques en el interior y lavado en fase venosa (Imagen 3, 4 y 5) siendo compatibles con abscesos tuberculosos.

Discusión:
La TBC hepática es infrecuente. Su diagnóstico requiere un elevado índice de sospecha, puesto que los síntomas clínicos y las pruebas complementarias suelen ser inespecíficas. Las pruebas de imagen, entre las que se incluye la EA, son de gran ayuda en esta entidad, a pesar de que no existe una lesión patognomónica. Es frecuente la hepatomegalia por infiltración difusa. La presencia de lesiones hepáticas compatibles con abscesos, en el contexto clínico adecuado, permiten establecer el diagnóstico. No obstante, en multitud de ocasiones es preciso realizar pruebas invasivas como la biopsia o PAAF guiada por ecografía.
Poster presentations

Imagen 1

Imagen 2

Imagen 3
Imagen 4.

Imagen 5.
PERFORACIÓN ILEAL POR CUERPO EXTRAÑO DETECTADO CON ECOGRAFÍA INTESTINAL

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INTRODUCCIÓN: La ingesta de cuerpos extraños es una entidad frecuente, aunque las complicaciones graves ocurren en menos del 1% de los pacientes. La ecografía gastrointestinal (GIUS) es un método que permite el estudio de alteraciones en el tubo digestivo. Presentamos el caso de una perforación contenida ileal secundaria a cuerpo extraño en una paciente con enfermedad de Crohn diagnosticada mediante GIUS.

CASO CLÍNICO: Mujer de 64 años diagnosticada de enfermedad de Crohn ileocólica estenosante, en tratamiento biológico. Ingresó por dolor en hemiabdomen derecho y febrícula, con elevación de reactantes de fase sin otras alteraciones analíticas. Se realizó GIUS que mostraba engrosamiento de la pared del íleon con una imagen lineal hiperecogénica que atravesaba la luz intestinal y se enclavaba en la pared (imagen 1), con hiperecogenicidad de la grasa mesentérica y plastrón adyacente a la lesión, sugerente de perforación contenida (imagen 2). Se confirmaron los hallazgos mediante TC abdominal. En diferido, fue intervenida mediante resección ileocecal, encontrando una cavidad abscesificada, pero sin identificarse cuerpo extraño.

DISCUSIÓN: La ingesta de cuerpos extraños es más frecuente en edad infantil y su manejo depende del tipo y localización del objeto. Las guías clínicas actuales indican la radiografía simple como la prueba inicial para estos pacientes, aunque el TC abdominal es el “gold estándar”. El rol de la GIUS no está estandarizado hasta el momento, pero hay estudios que avalan su uso con una sensibilidad hasta del 95%. Permite una valoración en tiempo real, la localización del cuerpo extraño, así como la relación de éste con la pared del tracto digestivo permitiendo, como en nuestro caso, detectar complicaciones, lo cual tiene repercusión sobre el manejo de estos pacientes. La principal limitación es la interposición de gas intestinal.
Imagen 1:

Imagen 2:

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SONOGRAPHIC EFFECTIVENESS ON PREGNANT PATIENTS WITH ABDOMINAL PAIN IN OUR EMERGENCY SERVICE

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Purpose
Abdominal emergencies during pregnancy occur in one out of 500-700 pregnancies and may involve gastrointestinal, gynecologic, urologic, vascular and traumatic etiologies; surgery is necessary in 0.2-2% of cases. Clinical presentations may be atypical and misleading because of pregnancy-associated anatomical and physiologic alterations, which often result in diagnostic uncertainty and therapeutic delay with increased risks of maternal and infant morbidity. The most common abdominal emergencies are acute appendicitis, acute calculous cholecystitis and intestinal obstruction. Acute pancreatitis is rare, usually resulting from trans-ampullary passage of gallstones. In this study, we aim to retrospectively review the files of the pregnant patients who applied to the emergency department with abdominal pain and to remind radiologic management of the painful pregnant in the emergency department.

Patients and Methods
This was a retrospective study comparing resource utilization in the last one year in a university hospital emergency department (ED). Result criteria included hospital resource utilization, demographics, and clinical characteristics. Descriptive statistics are presented with frequency, percentage, mean, standard deviation, and minimum and maximum values. Analyses were conducted using the SPSS 22.0 package program.

Results
In the ED, 90 pregnant women were admitted with abdominal pain. US and MRI is available 24/7 in our department. Ultrasonography was performed on all patients. Magnetic resonance imaging was needed only for 8 patients.

Conclusion
Ultrasound is the first choice for abdominal imaging in pregnancy because it is rapid, widely available, and because it avoids radiation exposure. It is an effective diagnostic tool for gynecologic, gastrointestinal, urinary, and hepatobiliary pathologies. It is also effective in detecting obstetrical pathologies and assessing fetal condition.
POPLITEAL SOFT TISSUE MASS WITH INDETERMINATE IMAGING FINDINGS: HISTOLOGICAL DIAGNOSES AT A TERTIARY CENTER.

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Objectives: Differentiation of benign and malignant soft tissue masses is clinical challenges for radiologists due to both categories have similar and overlapping imaging patterns and presenting features. Synovial sarcoma is a relatively common intermediate-to-high grade malignant tumor. The tumor is usually seen around knee in young ages without pain. In this report, we aim to indicate a popliteal soft tissue mass with benign imaging findings is not always benign.

Method and Result: A 45-year old male patient applied to hospital with knee restraint without pain. The patient suffered from slowly-enlarging mass in popliteal region. The patient underwent to US with a suspicion of Baker cyst. US findings were non-specific. There was a heterogeneous hypoechoic lesion with 3 cm long axis diameter in popliteal fossa. The preliminary diagnosis was a Baker cyst. The surgeon preferred an excisional biopsy to remove the lesion completely. Intraoperatively, the lesion was determined fixed, firm and the borders were undetermined; then, the surgeon suspected for malignancy and completed the surgery with the biopsy. Synovial sarcoma was the final pathological report with a delayed worsen practice.

Conclusion: Some conditions that affect the popliteal fossa may have benign imaging patterns on US. We believe synovial sarcoma should always be in the differential diagnosis of popliteal fossa lesions with indeterminate imaging features and needs a high index of radiological suspicion to avoid a worsen treatment practice.
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ULTRASONOGRAPHY MORPHOMETRIC EXAMINATION OF SPLEEN YOUNG VOLUNTEERS

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Abstract: In modern level the most perspective is development of noninvasive methods, one of these methods is ultrasonography morphometric examination of spleen, reflecting of immune status.

Purpose: Obtaining ultrasonography morphometric and hemodynamic parameters of spleen healthy people.

Methods: A total of 39 volunteers take part in research, medium age of examining were -21,4±2,7, medium weight were 65±20 kg and also medium height were-168 ±11sm. Ultrasonography examination realized by convex transducer, in a scanner of SonoScape and transducer frequency was 3-5.4 MHz. Three linear dimensions of spleen was measured (length, width, depth), estimated echo structure of organ. On the strength of morphometric figures was calculated coefficient of spleen mass(Km).

Results: Ultrasonography exploration showed that all volunteers have spleen with clear line, echo structure is homogeneous, one of the ten tested (10%) had sinus expression, only one of the thirty-nine tested has accessory spleen. Medium length of spleen was 10,2±1,26sm., width 6,9±1,69sm., depth 4,1±0,85sm., Accordingly, medium coefficient of spleen mass(Km) was 2,7±115. The amount of index differ from 0,7 to 6,1. Only 28,2% volunteers had Km ≤ 1,9, 22 people had Km 3,9 and 56,4% respectively. Km equal or more 4 had 6 of examined people 15,4%, established that volunteers had chronic infection diseases out of exacerbation, one of the at the moment of examining had exacerbation.

Conclusion:
1. Coefficient of spleen mass in healthy people have diapason from 1,3 to 3,9.
2. Increasing of Km more than 4 is a mark of infection disease.
THE ULTRASONOGRAPHIC DIAGNOSIS OF HYDRONEPHROSIS AFTER Hysterectomy WITHOUT INTRAOPERATIVELY RECOGNISABLE INJURY TO THE URETER AND THE RETROGRADE BALLOON DILATATION FOR THE TREATMENT

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Objectives: Ureter injury is a known complication secondary to hysterectomy procedure because of the anatomical proximity of the organs. This can affect renal function and even vital process. We herein describe the case of a ureter injury diagnosed by the ultrasonography and treated by the retrograde balloon dilatation which is a minimally invasive method.

Case report: A 49-year-old women with abnormal heavy bleeding and multiple leiomyomas underwent transabdominal hysterectomy. After surgery, she complained right side flank pain. Renal ultrasonography was performed and grade 2-3 hydronephrosis were diagnosed. Ureter was dilated till to the distal ending point. Retrograde balloon dilatation option was discussed with the patient instead of ureteroneocystostomy. The patient preferred minimally invasive approach. An ureteroscopic balloon dilatation catheter was placed across the stenotic segment by real time imaging under fluoroscopy. The guidewire was then removed to the stenotic junction and distend the renal pelvis with the help of iodine contrast. The guidewire was then re-inserted and kept until the operation was over. The balloon was inflated to a maximum diameter of 0.8 cm for 15 min. The balloon was deflated and the balloon catheter was removed after the operation. At last, a 10F double J stent was left and kept for 6 weeks. The Foley catheter was removed 3 days after operation. Ultrasonography were applied to evaluate the remission of hydronephrosis after 1-3 month and 1 year. After 3 months, the urinary tract was imaged by IVP. On IVP, the ureter calibration was in normal limits without any occlusion or stenotic segments. Pelvicalyceal system was minimally separated in right kidney.

Conclusion: We highlight the non-invasive diagnosis and the minimally invasive management of ureter injury after transabdominal hysterectomy. To the best of our knowledge, there are few case of such nature described in the literature. This complication can be diagnosed non-invasively by ultrasonography and treated by minimally invasive procedures.
ROLE OF ULTRASOUND IN PEDIATRIC VASCULAR HEPATIC DISEASES

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Imaging is essential for assessing normal liver vascular anatomy, its anatomical variants and vascular shunt, as well as determining the permeability of vessels and diagnosing porto-systemic anomalies. Aim: To present vascular hepatic diseases diagnosed in the last 2 years in the pediatric department. The ultrasound examinations were made by a clinician and not a radiologist. Results: Most of the patients were asymptomatic and the hepatic vascular anomalies were diagnosed incidentally. Five patients had portal vein variants (3 of them type 1), six patients were found to have portal cavernoma (splenomegaly was observed on physical exam), one had portal-systemic shunt type 2 Abernethy with portal aneurysm. One of two symptomatic patients was diagnosed with Budd Chiari disease, while the other had cardiac cirrhosis. Multiple hemangiomatosis was found in one case and MRI was performed to differentiate from hepatic metastasis. One case of Beckwith Wiedeman syndrome with a hepatic hemangioendothelioma needed periodic monitoring. Conclusions: Ultrasound remains a useful and non-invasive method of exploring abdominal pathology. Hepatic vascular exploration during the pediatric period brings extra information on congenital malformations, thrombosis, portal hypertension and tumors.