Objectives: To compare different forceps and needle-based instruments in hrMSUS-guided synovial biopsy in a cadaver study.
Methods: A core needle biopsy (A, Quickcore, Cook Medical, Bloomington, IN, USA), a retrograde forceps (B, Retroforce, Karl-Storz GmbH Tuttlingen, Germany), an anterograde arthroscopy forceps (C, Karl Storz GmbH, Tuttlingen, Germany) and an convexly shaped integrated core needle system (D, Synovex, Hipp Medical, Kolbingen, Germany) were tested for ultrasound-guided synovial biopsy of the suprapatellar recess in cadaver knee joints. Four senior rheumatologists scored each intervention from 0–5 regarding the following characteristics: visualization, handiness, accuracy, synovial tissue yield, invasiveness and overall suitability. Each intervention was recorded as static images and video clips.
Results: In all devices, enough representative synovial tissue was obtained and the instruments were all well visualized by hrMSUS. Core needle biopsy and the integrated needle system were best visualized due to their horizontally shaped closing mechanism. The core needle obtained a high yield of superficial synovial tissue and was the least invasive procedure. Despite handiness and accuracy were higher in the forceps instruments, overall suitability for hrMSUS-guided synovial biopsy was rated highest for the core biopsy needle.
Conclusions: Technically, all of the tested devices can be used for hrMSUS-guided synovial biopsy. Core needle biopsy seems to be most suitable for this intervention due to a low invasiveness, good visualisation and optimal yield of superficial synovial tissue.
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Disclosure of Interest: T. Hügle Shareholder of: Prof. Hügle contributed to the development of the Retroforce and Synovex instruments and receives royalties from Karl-Storz GmbH and Hipp Medical AG., P. Urbaniak: None declared, M. Müller-Gerbl: None declared, C. Marx: None declared, G. Tamborrini: None declared
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AB1066 DIAGNOSTIC UTILITY OF THE MEDIAN/ULNAR NERVE CROSS-SECTIONAL AREA RATIO IN CARPAL TUNNEL SYNDROME

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Background: The most commonly used ultrasonographic measurements for the diagnosis of CTS are measurement of the median nerve cross-sectional area (m-CSA) at different levels of the carpal tunnel.[1] The cross-sectional area of a nerve may differ according to biometric characteristics such as age, sex, height, weight and wrist thickness.[2–4]
Objectives: The aim of this study was to assess the diagnostic utility of the ultrasonographic ratio of m-CSA to ulnar nerve cross-sectional area (u-CSA), the m-CSA/ u-CSA ratio, in carpal tunnel syndrome (CTS).
Methods: Patients (n=50) with positive symptoms and electromyography results of CTS and control subjects (n=50) with negative electromyography results of CTS were evaluated. The most symptomatic hand of each participant were included in the assesment. Ultrasonographic m-CSA and u-CSA measurements were made at the level of the pisiform bone, and m-CSA/u-CSA ratio was calculated.
Results: Using the m-CSA cut-off value of 9.95 mm^2 showed a sensitivity of 92% and a specificity of 42%. Conversely, the cut-off value 13.90 mm^2 showed a sensitivity of 56% and a specificity of 92%. Using the cut-off value 2.96 for the ratio of m-CSA/u-CSA showed a sensitivity of 86% and a specificity of 38% while using the cut-off value 3.71 showed a sensitivity of 52% and a specificity of 90% in the diagnosis of CTS.
Conclusions: The ratio of m-CSA/u-CSA at the level of the pisiform bone did not provide an additional benefit for the diagnosis of CTS. Ultrasonographic m-CSA measured at the same level was found to be more sensitive and specific method.
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AB1067 SUITABILITY OF CADAVER MODELS IN ULTRASOUND DIAGNOSTICS AND INTERVENTIONS IN RHEUMATOLOGY: FOOT AND ANKLE

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Background: Employment of cadaver specimens in ultrasonography provides a useful and safe model for education, enhances the anatomical knowledge of sonographers and may help determine the accuracy of ultrasound-guided interventions.
Objectives: In this systemic literature review (SLR) we assessed the role and use of cadaver specimens in sonographic studies of the foot and ankle in the field of rheumatology.
Methods: For our literature review we utilized the MEDLINE database, which were supplemented by searches in Google Scholar and Science Direct when the articles were not available through PubMed. Original studies in English language were included in the full paper review with an exception of three German language studies with English abstracts were also included. In the full paper review studies were selected for inclusion featured the sonographic study of cadaver specimens of the foot and ankle. Data were extracted on study characteristics and interventions.
Results: The search yielded 1241 articles, of which 130 were selected for detailed review. In the end, 23 full papers met inclusion criteria. The studies could be grouped as follows: description of detailed ultrasound anatomy (9), testing of accuracy of ultrasound guided interventional procedures (8), examination of artificial tears and lesions (4), foreign bodies (1) and joint effusions (1). The results that were obtained in the studies of the fully reviewed papers utilized a total of 294 cadaveric specimens, with an average of 12.78 (range: 1–48) cadaveric specimens included in each study.
Conclusions: The use of cadaver specimens of the foot and ankle may facilitate the validation of new sonographic methods which assess these joint regions, however the major disadvantage of these studies was the low number of cadaveric specimens.
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AB1068 ULTRASOUND OF SALIVARY GLANDS IN SJOGREN'S SYNDROME- WHICH SEMI-QUANTITATIVE SCORING SYSTEM IS THE BEST?

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Background: Sjogren Syndrome (SS) affects mainly exocrine glands. The latest diagnostic criteria designed for clinical studies are also used as guidance in clinical practice [1].
Ultrasonography (US) demonstrates specificity and sensibility in parotid and submandibular gland evaluation (SG). Parameters considered are echogenicity, homogeneity and margins regularity [1,2,3]. To standardize the assessment of B mode US of SG, different semi-quantitative scores were proposed.
Objectives: To apply and compare 9 US semi-quatitative scoring systems in B mode scanning of salivary glands in Sjogren Syndrome.
Methods: A research using keywords "salivary glands", "ultrasonograpy", "Sjogren Syndrome", "semi-quantitative score" in Medline/Pubmed was performed. There was a selection of most relevant articles. There were not considered relevant publications with impact factor <1. We performed the examination on SG in B mode US and applied these scores (De Vita, Niemela, Hocevar, Salaffi, Yukinori, Cornec,Theander) to our patients (primary and secondary SS).
Results: Eighty four SG in patients diagnosed with primary and secondary (57.15%) SS were assessed. In the group of patients with SSA/SSB presence (85.7%), mean score was De Vita 1.78+/-1.21, Niemela 2.56+/-2.17, Hocevar and Wernicke 2.39+/-2.14, Salaffi 2.83+/-2.52, Yukinori 2.39+/-2.14, Milic 3.39+/-2.14, Cornec 1.78+/-1.215, Theander 1.28+/-0.752. Schirmer test and the need for using the artificial tears was correlated to SG alterations in scoring systems proposed by Niemela (r 0.465, $p<0.05$) and Salaffi (r 0.496, $p<0.02$). All scoring systems were strongly correlated between them ($r>0.8$, $p<0.01$).
Conclusions: Inhomogeneity of parenchyma was considered in all scoring systems. Others considered relevant glandular dimension and margins regularity [2,3.4]. There was no difference between the scoring systems. Xeroftalmia valided through Schirmer test is correlated to SG parenchymal alterations. Our data is an update about semi-quantitative scoring systems in US of SG in SS.
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AB1069 SHOULDER ULTRASONOGRAPHY IN DIABETIC PATIENTS – IS THERE DAMAGE WITH NO CLINICAL SIGN?

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Background: Degenerative lesions in shoulder rises exponentialy with age and diabetes was found to be associated with shoulder pain [1,2].
Objectives: To evaluate the prevalence and type of lesions of shoulder in diabetic patients with no pain using ultrasound (US).
Methods: We included consecutive patients with diabetes with no pain or clinical tumefaction in shoulder. US was performed in both shoulders using the standard scanning planes and dynamic maneuvers. Clinical data as fasting glycemia, BMI, treatment were recorded.
Results: Forty two shoulders were examined in 21 consecutive patients (mean age 67.92+/-7.35 years, weight 81.75 +/- 13.57 kg, BMI 25+/-2 kg/m^2, fasting glycemia 151.85+/-33.72mg/dl) with diabetes diagnosis mean 5.33 years +/- 5.99. Majority of patients were under treatment with oral antidiabetics (58.3%). Degenerative lesions were found in subscapular (SSc) 33.3% and supraspinatus (SpS) 8.3%) tendons as well as intratendinous micro ruptures with calcifications (33.3% bilateral calcifications in SSc, SpS). Impingement syndrome was objectified in 16.6% of examinations. Minimal inflammatory signs as: sub-acromion sub deltoidian bursitis in 50% (minimum in 33.3%, 8.3% bilateral) and long head biceps tenosynovitis in 58.33% (8.3% minimal Doppler signal). 83.3% showed humeral irregularities and also erosions were found (8.3%).
Conclusions: Degenerative and minimal inflammatory lesions in shoulder of diabetic patients exist with no clinical sign (pain, tumefaction). Ultrasonography might be an usefull technique to confirm these alterations before the appearance of symptoms.
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AB1070 UNRAVELLING AUTOIMMUNE DISEASES THROUGH NAILFOLD CAPILLAROSCOPY

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Background: Nailfold capillaroscopy (NC) is non-invasive and used by clinicians as a diagnostic tool. It allows the distinction between primary and secondary Raynaud Phenomenon (RP), the latter usually associated to autoimmune diseases (AID).
Objectives: Characterize the utility of NC assessment for diagnosis of AID and to evaluate main differences in NC pattern, according to the presence of RP.
Methods: NC were performed with a Videocap biomicroscope using well established classification criteria [1]. NC images and reports from all patients evaluated from January 2011 to final December 2016 were retrospectively analysed. Comparisons were made using the Wilcoxon Rank Sum and Chi square tests, p values of $<$0,05 were considered statistically significant.
Results: In the last 6 years, 1100 NC were performed, 159 to man and 941 to women. Mean age was 42 [±19] years. NC requests came from 17 different hospital units. RP was present in 83% of patients (RP+, n=909) of whom 71% (n=641) had a prior diagnosis of AID, most frequently Systemic Sclerosis (SSc) (24%, n=143), Systemic Lupus Erythematosus (SLE) (21%, n=123), Sjögren's Syndrome (SS) (10%, n=62), Mixed Connective Tissue Disease (MCTD) (9%, n=52) and Antiphospholipid Syndrome (APS) (8%, n=48). NC patterns allowed for the classification of RP+ subjects into primary (3%) and secondary (81%); in 4% of subjects NC findings were abnormal but inconclusive. From secondary RP, scleroderma (37%) and non-scleroderma pattern (62%) were further separated; the former was later classified according to scleroderma-like (15,02%), early (33%), active (38%) and late (15%) scleroderma patterns.29% of RP+ patients did not have AID diagnosed; NC disclosed the diagnosis of SSc (n=24), APS (n=5), SS (n=4), SLE (n=2), MCTD (n=1), overlapping syndrome (n=1) and paraneoplastic syndrome (n=1).
In RP- patients, the main diagnosed AID were SLE (20%, n=17), SSc (14%, n=12) and SS (8%, n=7). NC results in RP- subjects were normal (24%) (including 92% of controls), inconclusive (22%) and suggestive of capillaritis (16%). Although RP-, some patients (38%) presented dysmorphic capillaries suggestive of secondary involvement (38%); NC findings in these patients included megacapillaries and microhemorrhages (scleroderma-like (26%), early (41%), active (30%) and late (7%)).
Demographic data was similar in both groups. Statistically significantly higher frequencies of AID ($p<0.0001$), SSc ($p=0.0006$), NC secondary non-SSc pattern ($p<0.0001$) and NC secondary active SSc pattern ($p=0.002$) were found in RP+ patients.
Conclusions: NC findings in RP+ were more pathological than in RP-subjects, probably due to pre-existing AID and more frequent positivity. Secondary non scleroderma pattern was more prevalent in RP+ patients. In RP- group, almost a quarter of NC assessments were normal, but capillary abnormalities were also revealed, suggesting this diagnostic approach can help to disclosure microvascular disease, even if RP is absent. NC further disclosed important leads to diagnose SSc, APS and MCTD in our population.
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AB1071 SIMPLIFIED ASSESSMENT IN NAILFOLD CAPILLAROSCOPY IN RHEUMATOLOGY

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Background: Nailfold Capillaroscopy is a non-invasive diagnostic technique designed to evaluate small vessels of the microcirculation. The most important indication for capillaroscopy is Raynaud's phenomenon. The complexity and meticulous evaluation of the eight fingers is difficult to apply in daily practice given the limited availability of time to perform. For this reason it is necessary to develop simple and abbreviated techniques, to achieve an optimal and rapid evaluation of the patient.
Objectives: Determine the performance of the method of the 4° finger for the diagnosis of SD pattern in patients with Raynaud's Phenomenon taking the eight finger pattern as a gold standard.
Methods: Cross-sectional study with blinded and independent measurements. Nailfold Capillaroscopy was performed on the four fingers of each hand, except thumbs. Another observer evaluated the 4th finger of the hands. The interobserver agreement was made before carrying out the study and was 100%. The 8-finger method (gold standard) was considered positive when at least one finger has SD pattern and the 4° finger method was considered positive when at least one of them presents the SD pattern. We included patients older than 18 years with a diagnosis of Raynaud Phenomenon. Patients with thickening of the skin in the nailfold, digital lesion that made it difficult to assess (trauma, amputation, burns, etc.) and patients who did not consent to the procedure were excluded.
Results: We included 78 patients, 90% was female. The mean age was 53 years (DS +/- 13.5). Sixty-three patients had a score of eight fingers positive (cases) and 15 had a score of eight fingers negative (controls). The sensitivity of the 4° finger evaluation method was 89% (95% CI: 82–96%) and 93% specificity (95% CI: 88–99%). The positive predictive value of this method was 98% (95% CI: 95–100%) and the negative predictive value was 67% (95% CI: 56–77%). The positive likelihood ratio was 13 (95% CI: 2–89).
Conclusions: The simplified method of the 4° finger showed good performance for the diagnosis of SD pattern compared to the standard method of evaluation of the 8 fingers.
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