**Objectives:** To find the micro-structural correlate of the origin of bone erosions in the bare area of the human joint

Methods: Bare areas of human joints were analyzed for early microstructural changes by in-vivo high-resolution peripheral computed tomography (HR-pQCT). First, bare areas were exactly defined by scanning 6 cadaveric hands for localization of the bare area in the human metacarpal head. Bone lesions found in the cadaveric hand by HR-pQCT were additionally by super-resolution ex vivo micro-CT (μCT40). Then, number and distribution of the type of bare area bone lesion found in cadaveric study were analyzed in a cohort of 105 healthy individuals and 107 anti-citrullinated peptide (ACPA) positive RA patients with similar sex and age distribution.

Results: HR-pQCT combined with adaptive thresholding allowed the definition of a new type of bone lesions in the bare areas of the human joint termed "COMIC" standing for "cortical micro-channel". Their existence in the bare area was additionally validated by microCT (Figure 1). RA patients showed significantly (p<0.001) more CoMiCs (112.9±54.7/joint) than healthy individuals (75.2±41.9/joint) with 20–49 years old RA patients exhibiting similar CoMiC numbers as observed in over 65 year old healthy individuals. Importantly, CoMiCs were found in RA patients already very early in their disease course with enrichment in the erosion-prone radial side of the joint.
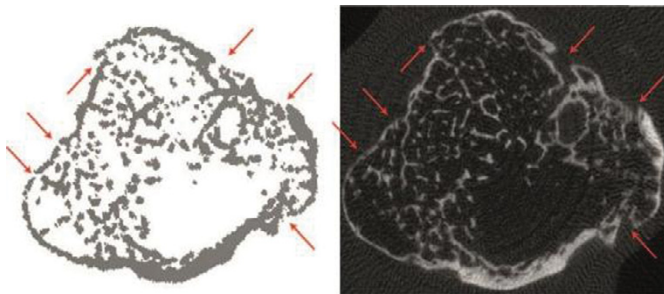
Conclusions: CoMiCs represent a new structural feature of the joint, which is characteristic for the bone of the bare area. COMICS at low level are also found in young healthy individuals but they significantly increase with age and particularly with RA. COMICs develop much earlier and much more pronounced in RA patients than in healthy individuals and therefore represent an interesting new early indicator for erosion development in ACPA positive RA patients.

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SAT0629 **ELECTRODIAGNOSTIC VS ULTRASONOGRAPHY: WHICH ONE IS BETTER TO CONFIRM DIAGNOSIS OF ULNAR NEUROPATHY AT ELBOW?**

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Background: Ulnar neuropathy at the elbow is the second most common compression neuropathy preceded by carpal tunnel syndrome. Although this diagnosis has been traditionally confirmed by electrodiagnosis (EDX), ultrasonography (US) is a re-emerging alternative method which can also evaluate the cubital zone anatomy. This study determines the maximum amount of US sensitivity and specificity by assessing different sonographic parameters and evaluates consistency and diagnostic value of the best US method in compare with EDX.

Methods: We included 66 participants (32 elbows of patient and 34 normal elbows) and performed physical exam, US and EDX for both groups. Patients were classified into four severity grades using EDX criteria. The parameters of US were cross sectional area (CSA) of ulnar nerve at three levels: medial epicondyle (CSA med), 2cm distal (CSA dist) and 2cm proximal (CSA prox) to medial epicondyle. Then we would be able to evaluate consistency between two tests using area under receiver operating curve (AU-ROC) method and also to determine the optimum CSA cut-off point to better diagnosis of ulnar neuropathy by US.

Results: Our findings showed that CSA med and CSA dist had significantly larger size in patients compared to normal participants (P-value =0.01 and 0.05, respectively). This increase in nerve size was more prominent among those who had axonal lesion rather than patients with demyelinated lesion (p-value <0.01). Moreover those who had longer duration of symptoms had significantly higher CSA med. and CSA dist. (p-value=0.015 and 0.001 respectively). The other promising findings were two important points; First a strong correlation between CSA med. and severity grade (p-value=0.034) and the second correlation was between CSA med and CSA dist. with a cross-elbow nerve conduction velocity (NCV) (p-value=0.01 and 0.02, respectively). Finally we assessed US diagnostic value as it showed AU-ROC =0.871, that means a very good coverage for an alternative diagnostic method. Also our results showed specificity of 80% and sensitivity of 84% for US in the CSA med cut-off point =9mm^2 for diagnosis of ulnar nerve entrapment at elbow.

Conclusions: Based on these results we can conclude that US is a highly sensitive and specific method to diagnose ulnar neuropathy at elbow and can be used as an alternative and complementary method in diagnosis of ulnar neuropathy at elbow in particular when EDX is not available. However it could not be still a definitive and substitute mutually exclusive method to EDX in diagnosis of ulnar neuropathy

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SAT0630 **EXTRA-ARTICULAR MUSCULOSKELETAL INVOLVEMENT IN JUVENILE IDIOPATHIC ARTHRITIS: CLINICAL AND ULTRASONOGRAFIC FINDINGS**

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Background: in Juvenile Idiopathic arthritis (JIA), musculoskeletal ultrasound (MSUS) has been proven to be more sensitive than clinical evaluation in detecting articular synovitis. Nevertheless, many studies report a variable percentage of clinically active joints, that are judged normal by ultrasound examination. In absence of a feasible and reliable gold standard for pediatric synovitis (histology or MRI), this point may weaken the confidence in ultrasound, that is nevertheless perceived as an interesting tool, in the management of JIA.

Objectives: This preliminary study investigates the possibility that sometimes the clinically detected synovitis could be missed by ultrasound, because of its extra-articular localization.

Methods: 43 consecutive children affected by JIA underwent separated clinical and ultrasound assessments, blindly, in the same day. Patients were followed up in a pediatric Rheumatology Unit. The following clinical data were collected: age, sex, disease duration, subset of JIA, ongoing therapy, previous therapy, disease activity. By MSUS, the synovitis was investigated bilaterally, both in gray scale and power Doppler, in the MCP and subtalar joints, wrists, knees, ankles, in the flexor and extensor tendons of the wrist and hand, in the anterior, medial and lateral tendons of the ankle, in the synovial bursae of knee and ankle. The possible involvement of the entheses was also investigated. The definition of ultrasonographic synovitis was based on the preliminary OMERACT definitions of synovitis in children. The inter and intra observer reproducibility of the MSUS examination was tested, independently, both between two operators and through a second assessment of the stored images.

Results: 43 children affected by JIA were recruited, in the outpatient clinic of the Regina Margherita Pediatric Hospital of Torino, Italy. They were 9 boys and 34 girls, median age 7,7 (IQR 5,5–10,1), 27 oligoarticular, 11 poliarticular, 4 psoriatic arthritis, 1 undifferentiated arthritis. The median disease duration was 44 months (IQR: 20,5–61,5), 20 patients in remission, 23 with active disease. 774 joints, 1548 synovial sheaths, 430 entheses and 258 synovial bursae were assessed. The physical examination detected inflammation in 54 joints, 33 tendons, 0 entheses,

0 bursae. Ultrasound abnormalities were found in 62 joints, 73 tendons, 8 bursae, 0 entheses. Overall physical examination and MSUS showed good concordance even if MSUS was more sensitive especially in detecting extra-articular locations.
Conclusions: If the extra-articular locations of synovitis are taken in consideration during the ultrasound examination, there is a good sensitivity of MSUS and a better concordance between clinical and MSUS assessment of JIA. MSUS seems more accurate than physical assessment in detecting the exact position of the inflamed synovial membrane in each anatomical location (joint, synovial sheath, synovial bursa). It could be helpful not only for better addressing the injective procedures, but also for a global quantification of the synovitis (both intra and extra-articular), even if the exact clinical meaning of these ultrasound findings is still unknown, in terms of response to treatments and prognosis.
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Disclosure of Interest: None declared
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SAT0631   **INTER-OBSERVER AND INTRA-OBSERVER RELIABILITY OF THE OMERACT ULTRASONOGRAPHIC (US) CRITERIA FOR THE DIAGNOSIS OF CALCIUM PYROPHOSPHATE DEPOSITION DISEASE (CPPD) AT THE METACARPAL-PHALANGEAL (MCP), WRIST, ACROMION-CLAVICULAR (AC) AND HIP JOINTS**

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Background: The OMERACT US subtask force "US in CPPD" recently created the definitions for US identification of crystal deposits in joints and tested the reliability at the knee [1].
Objectives: To assess the inter/intra-observer reliability of US on detecting CPPD at triangular fibrocartilage complex (TFCC) of the wrists, fibrocartilage of the AC joint, hip labrum (HL), hyaline cartilage (HC) of the metacarpal (MC) and femoral head.
Methods: The OMERACT criteria for CPPD were used for the exercise [1] using a 2 steps approach. First, the panel of experts gave a dichotomous score (presence/absence of CPPD) of 120 images of the sites included, using a web platform. The images were evaluated twice to assess the inter/intra-observer reliability. Then, the experts met in Siena for a patient based exercise. Bilateral evaluation of TFCC, AC, HL /HC of the hip and HC of the II-III MCP of 8 patients was carried out twice in a day, using a dichotomous score for CPPD. 8 US machines (3 GE, 1 Samsung and 4 Esaote) equipped with high resolution linear probes were used.
Results: Reliability values of static exercise were high for all sites, demonstrating that definitions were clear. The results of the second step are presented in table 1. On live scanning, the TFCC resulted the most reliable site for CPPD assessment, followed by AC. Other sites demonstrated lower kappa values and thus are not reliable for CPPD assessment.
Conclusions: TFCC of the wrist is the most reliable site for CPPD. By adding these results to the previous [2], we confirm that the OMERACT definitions for CPPD can be applied reliably at the knee (meniscus and HC), TFCC and AC, usually the most involved sites in CPPD. The next step of the OMERACT subtask force will be to test these findings in a longitudinal observational study.
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Disclosure of Interest: None declared

Section	Mean prevalence	Mean observed agreement	Mean kappa	PabaK*
Inter-Reader Agreement				
1) ALL	48,2	0,71	0,43	0,42
2) Fibrocartilage	72,7	0,75	0,39	0,51
3) Hyaline cartilage	23,7	0,67	0,09	0,34
4) Hand	22,6	0,69	0,12	0,38
5) Wrist Fibrocartilage	95,1	0,91	0,01	0,82
6) Acromion-Clavicular Joint	61,1	0,75	0,51	0,51
7) Hip	43,7	0,61	0,23	0,23
7a) Hip Labrum	61,8	0,6	0,16	0,19
7b) Hip Cartilage	25,7	0,63	0,04	0,26
Intra-Reader Agreement				
1) ALL	48,3	0,85	0,69	0,71
2) Fibrocartilage	73,1	0,85	0,57	0,71
3) Hyaline cartilage	23,4	0,86	0,53	0,73
4) Hand	23	0,84	0,48	0,69
5) Wrist Fibrocartilage	95,1	0,93	0,66	0,87
6) Acromion-Clavicular Joint	62,5	0,88	0,68	0,76
7) Hip	42,9	0,82	0,58	0,66
7a) Hip Labrum	61,7	0,73	0,32	0,47
7b) Hip Cartilage	23,9	0,91	0,67	0,83

Strength of agreement: < 0.20 Poor. 0.21 - 0.40 Fair. 0.41 - 0.60 Moderate. 0.61 - 0.80 Substantial. 0.81 - 1.00 Excellent
*Pabak: Prevalence-Adjusted Bias-Adjusted Kappa

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SAT0632   **IMPACT OF LUMBAR SPINE MORPHOLOGY (SCOLIOSIS) ON EARLY SPONDYLOARTHRITIS PATTERN (THE IMPALA-DESIR STUDY)**

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Objectives: To evaluate the impact of scoliosis on both clinical presentation and lumbar imaging of early inflammatory back pain suggestive of spondyloarthritis.
Methods: The DESIR cohort is a prospective longitudinal cohort study of adults aged 18–50 with inflammatory back pain (IBP) $\geq$3 months, $\leq$3 years. Baseline lumbar X-Rays of patients included in DESIR cohort were read by two central blinded fellow readers (and a rheumatologist spine specialist in case of discrepancy) for presence or not of scoliosis (defined as a Cobb angle$>10°$ and a Nash Moe grade$\geq$1). Associations between scoliosis and baseline clinical variables, presence of X-Rays (New York) and MRI (ASAS and MORPHO proposal definition) sacroiliitis, presence of spinal signs of spondyloarthritis (mSASSS, BASRI-total, SPARCC scores), presence of spinal degenerative MRI signs on X-rays (yes or no) and MRI (presence of Modic abnormalities, Pfirrmann score, Canal stenosis, Extrusion, High intensity zone Facet osteoarthritis) according to central reading (two readers) and axSpA diagnostic confidence (according to local clinician's confidence on a 0–10 visual analogic scale) were assessed by univariate analysis using the chi-square test (or Fisher's exact test where appropriate) and the Mann-Whitney test. Adjustment for multiple testing was performed according to Bonferroni method.
Results: 675 patients (47.1% men, mean age of 33.6 years, 89.6% had lumbar pain, 65% fulfilling ASAS criteria) were studied. The mean Cobb angle was 3.2° ($\pm$ 4.8) and 49/675 (7.3%) patients had lumbar scoliosis. The only significant difference was the lumbosacral sagittal balance. Indeed, scoliotic patients had greater lumbar lordosis (57.8° versus 50.9°; p$<$0.001) than non-scoliotic. About MRI findings, spinal degenerative manifestations were very scarce in both groups. The major part of degenerative changes was in the two last lumbar discs and vertebras, without significant difference between scoliotic and non-scoliotic patients.
Conclusions: Scoliotic patients with inflammatory back pain suggestive of spondyloarthritis do not have more lumbar degenerative lesions than non-scoliotic patients, nor difference of clinical presentation, but they have greater lumbar lordosis.
Disclosure of Interest: None declared
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SAT0633   **NOT A REPLACEMENT BUT A POSSIBLE SUBSTITUTION: DETECTION OF SACROILIITIS ON MAGNETIC RESONANCE ENTEROGRAPHY IN PATIENTS WITH AXIAL SPONDYLOARTHRITIS**

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Background: MR Enterography (MRE), a part of the diagnosis in patients with inflammatory bowel disease (IBD), is increasingly used to exclude Crohn's Disease (CD) in SpA patients with diarrhea. Two important retrospective studies[1,2], on IBD