AB1219  CONTRIBUTION OF MRI TO CERVICAL INVOLVEMENT IN RHEUMATOID ARTHRITIS: PROSPECTIVE STUDY OF 30 CASES

S. reki1, K. Zouaoui1, S. bousaid1, H. sehli1, E. cheour1, M. elleuch1.
1rheumatology, la rhabta hospital, 2rheumatology, charles nicole hospital, tunis, tunisia, tunisia

Background: Cervical spine involvement is common during RA and is characterized by its potential severity.

Objectives: To determine the prevalence of cervical involvement in RA, to clarify the contribution of MRI to diagnosis and to identify predictive factors for cervical rheumatoid involvement.

Methods: Our study included 30 RA patients with a duration of more than 2 years.

Results: 16 patients (53%) were assessed on the two imaging methods (standard radiographs in 37% and MRI in 53%), of which 2 cases (7%) were asymptomatic. This cervical involvement was dominated by the C1-C2 pannus, erosions and subluxations of the cervical spine in 50% of cases. The aSIs of the AAS, aAAS were the most frequent with a prevalence of 23%, followed by the pAAS found in 10% of the cases, the vAAs present in 7 cases and then the AAs and the vAAs objectivated in 3% each. The ASS was found in 3 cases (10%), odontoid erosions in 11 cases (37%), C1-C2 arthritis in 5 cases (16%) and inflammatory spondylodiscitis in 6 cases (20%). MRI resulted in a better study of the C1-C2 pannus and odontoid erosions as well as the evaluation of the impact of the cervical lesions on the neural axis: a medullary imprint was noted in 4 cases (13%). Several factors were associated with cervical rheumatoid involvement: the presence of coccobrochial neuralgia or bulbar movements, duration of PR > 5 years, HAQ score > 1.1 and positive RF. The search for factors associated with AAS has revealed the duration of the disease, DAS 28 > 3 and the presence of a biological inflammatory syndrome.

Conclusions: Cervical involvement accompanies the active and destructive forms of RA. It can be asymptomatic, it is the interest to seek it in a systematic way in RA. The standard radiography with dynamic views is to be realised first-line. The MRI must be indicated in order to make an early diagnosis, to carry out an accurate lesion assessment and to guide the therapeutic decision.

Disclosure of Interest: None declared

AB1220  STUDY OF THE RELATIONSHIP BETWEEN TOE DEFORMITIES IN THE FOREFOOT REGION AND THE FLEXOR TENDONS IN RHEUMATOID ARTHRITIS USING 3D VOLUME RENDERING

1Department of Orthopedic Surgery, AKITA CITY HOSPITAL, Akita; 2Department of Orthopedic Surgery, Hirakaa General Hospital, Yotok; 3Department of Orthopedic Surgery, Ogachi Central Hospital, Yuzawa; 4Department of Orthopedic Surgery, Akita Kousei Medical Center, Akita; 5Department of Orthopedic Surgery, Noshio Kousei Medical Center, Noshio; 6Department of Orthopedic Surgery, Nakadori General Hospital, Akita University Graduate School of Medicine, Akita, Japan

Background: Multi-slice computed tomography (CT) is frequently used to evaluate the morphology, arrangement, and other characteristics of bone. Three-dimensional volume rendering (3D-VR) has made it possible to three-dimensionally visualise tendons and other structures by arbitrarily changing CT values. In deformities of the forefoot region in rheumatoid arthritis (RA), dislocation of the metatarsophalangeal (MTP) joints results in the forefoot deformities which require surgery; however, the toes can sometimes be displaced inwards or outwards by this dislocation. MTP joint dislocation also causes the flexor tendons to dislocate from their original positions, although the relationship with toe displacement is unclear.

Objectives: We therefore used 3D-VR to examine the relationship between the flexor tendon displacement and toe dislocation in the dislocated toes of RA patients.

Methods: Thirty-one feet (10 right and 21 left) of 24 patients (5 men and 19 women) were examined. The Tsuobi classification was used to classify MTP joint dislocation in subluxation (Grade 2) or dislocation (Grade 3). CT images taken with no load applied to the feet were used for preoperative evaluation. The mean age of the patients at the time of imaging was 59.0 (36–76) years. A Fujifilm volume analyzer (SYNAPSE VINCENT) was used for 3D-VR reconstruction and CT values were adjusted to visualise the flexor tendons and examine their relationship with the heads of the metatarsal bones. When the flexor tendons were displaced inwards or outwards from the base of the metatarsal bone head, this was classified as flexor tendon dislocation. Toe displacement was identified when the proximal phalanx was displaced inwards or outwards from the extended line of the metatarsal axis.

Results: MTP joint dislocation was seen in 80 toes (63 cases of dislocation and 17 cases of subluxation). The flexor tendons were dislocated in 27 s toes (15 inward and 12 outward), 27 third toes (21 inward and 6 outward) and 16 fourth toes (15 inwards and 1 outward). Of the cases of MTP joint dislocation, toe displacement was seen in 32 cases (1 inward and 11 outward), 12 third toes (9 inward and 3 outward). The flexor tendons were dislocated towards the dislocated toes in all cases. No flexor tendon dislocation was seen in any of the cases of subluxation.

Conclusions: RA is often accompanied by hallux valgus and toe displacement is affected by retraction of the first toe. The results of this study demonstrate that the toes are displaced inwards in some cases and can be displaced independently of the influence of the first toe. All the toes were displaced towards the dislocated flexor tendons and MTP arthritis had resulted in loosening of the joint capsule and ligaments and dislocation of the flexor tendons, which was likely to cause displacement.

Disclosure of Interest: None declared

AB1221  THE ASSOCIATION BETWEEN SYNOVITIS IN THE FOOT ON JOINT ULTRASONOGRAPHY AND CLINICAL PARAMETERS IN PATIENTS WITH RHEUMATOID ARTHRITIS

1Department of Orthopedic Surgery, AKITA CITY HOSPITAL, Akita; 2Department of Orthopedic Surgery, Hirakaa General Hospital, Yotok; 3Department of Orthopedic Surgery, Ogachi Central Hospital, Yuzawa; 4Department of Orthopedic Surgery, Akita Kousei Medical Center, Akita; 5Department of Orthopedic Surgery, Noshio Kousei Medical Center, Noshio; 6Department of Orthopedic Surgery, Nakadori General Hospital, Akita University Graduate School of Medicine, Akita, Japan

Background: Treatment of rheumatoid arthritis (RA) has improved dramatically with the widespread use of biological disease-modifying antirheumatic drugs. In this context, the number of RA patients who undergo orthopaedic surgery is reportedly decreasing. However, the number of RA patients who undergo foot surgery is increasing. Joint ultrasonography has been used for early diagnosis and

Disclosure of Interest: None declared
disease activity assessment in RA, allowing visualisation of synovitis. However, few detailed studies or evaluations of clinical parameters related to synovitis in the foot have been performed.

Objectives: This study investigated the association between synovitis in the foot as observed on joint ultrasonography and the degree of disability on the health assessment questionnaire (HAQ) in RA patients.

Methods: The study included 79 outpatients (101 feet) with RA. Patients who had undergone surgery were excluded. The mean age was 66.0 years (24–92 years), and the mean disease duration was 13 years and 5 months (ranging from 1 month to 49 years). Joint ultrasonography was performed by the same examiner using the same diagnostic instrument in the same room. Synovitis was defined as a power Doppler score of ≥Grade 1. The scanning sites were forefoot (metatarsophalangeal joints of toes 1–5), metatarsus (calcaneocuboid and talonavicular joints), and hindfoot (talocrural and subtalar joints, peroneal tendon, posterior tibial tendon). The presence or absence of synovitis was evaluated at each site, and the association with the HAQ score was examined.

Results: Synovitis was detected in the forefoot of 40 feet (39.6%), in the metatarsus of 34 feet (33.7%), and in the hindfoot of 63 feet (62.4%). Patients with synovi-
tis in the forefoot (PD+: 0.41±0.1, PD-: 0.80±0.1), PD+ had significantly higher HAQ scores.

Conclusions: Given that assessment of foot impairment is not included in the dis-
ease activity index for RA, there may be a delay in diagnosis of foot lesions. Our results showed that patients with synovitis in the forefoot and rearfoot had lower HAQ scores (disability measure), suggesting that increased physical activity may be associated with increasing incidence of synovitis in the foot. The ability of RA patients to perform activities of daily living may have improved with advances in pharmacotherapy, leading to increased physical stimulation, resulting in an increased incidence of synovitis of the foot.

REFERENCES:

Disclosure of Interest: None declared

Comparative quantification of MRI fat-fraction measurement in SIJ joint on different scanner platforms

A. Bainbridge1, T. Bray2, J. Jones3, S. Tansley4, N. Fulstow4, R. Sengupta4, R. Thomas3, A. Bainbridge1, A. Bainbridge1,
1Medical Physics and Biomedical Engineering, University College London Hospitals NHS Foundation Trust; 2Centre for Medical Imaging, University College London, London; 3Radiology, Nuffield Health Hospital, Bristol; 4Royal National Hospital for Rheumatic Diseases, Bath, UK

Background: Quantitative MRI Proton Density Fat Fraction (PDFF) measure-
ment can objectively identify areas of active inflammation and structural damage in spondyloarthritis by identifying oedema and fat metaplasia in bone marrow. PDFF is typically implemented as a 3D multi-echo Gradient-echo protocol and all of the major MRI equipment manufacturers have PDFF imaging products available that combine a complex multi-peak fat-spectrum model with simultaneous determination and correction for T2* signal decay. However, if the appropriate specialist imaging option has not been purchased, as is commonly the case, then the user may have to rely on simpler base-level protocols for fat-fraction measure-
ment. An important step to implementing quantitative fat-fraction measurement as a clinical tool is to demonstrate that measurements are robust to both scanner platform and measurement technique.

Objectives: We aimed to compare quantitative PDFF measurements obtained using 3 scanners supplied by different manufacturers, and using a range of techniques.

Methods: The sacroiliac joints (SIJ) of 10 healthy volunteers (mean age 42 years, range 23–63) were scanned on 3 scanners: a) 3T Philips Ingenia using MDixon Quant (MDO) – a specialist PDFF package; b) 1.5 T GE Optima MR450W, using IDEAL and LAVA – both base-level options; and c) 3T Siemens Skyra, using DIXON – a base-level option. We also scanned a fat-water phantom constructed with tubes of emulsions of peanut oil and 3% agar. MDO uses data from 6 differ-
ent echo-times: IDEAL from 3; and LAVA and DIXON from 2. The excitation flip angle was set to 3 degrees for all acquisitions to minimise the T1 weighting. Each technique yields Fat-only (F) and Water-only (W) images. FF images were calculated using the formula: FF=F/(W+F). Regions of interest (ROIs) were drawn in the SIJ as shown in the first figure. MDO PDFF was used as the ‘gold-standard’ meas-
urement for comparison to IDEAL, LAVA and DIXON.

Results: The figure shows the results of the ROI analysis. For the phantom meas-
urements, both LAVA and IDEAL correlated well with MDQ, but Siemens DIXON deviated away from the expected linear relationship. The in vivo data showed good linear relationships with MDQ for all 3 base-level techniques for FF in the range 0.4–0.8, although all 3 slightly underestimated FF compared to MDQ.

Conclusions: A clinically useful quantitative image-analysis tool should be appli-
cable to results obtained from several platforms. FF measurement in the bone marrow of the SJ is robust to both technique and platform. The slight underesti-
mation of FF values on base-level FF measurements is probably due to the influence of T2* weighting. However, these variations are smaller than the FF changes found in areas of oedema or fat metaplasia.1 FF measurement is a quantitative and widely applicable method for the diagnosis and assessment of spondyloarthritis.

References:
[1] Bray TJ, Bainbridge A, Punwani S, Iannou Y, Hall-Craggs MA. Simulta-

Disclosure of Interest: None declared

Ultrasoundography examination of elbows is useful when combined with examination of PIP and wrist joints

T. Nakajima1, M. Shimizu2, M. Hashimoto3, H. Yamamoto2, R. Kawahara2, S. Nakabo2, R. Hiwa3, Y. Goni4, S. Funakoshi5, Y. Nakamura5, T. Sasaki6, T. Tomizawa3, K. Nishitani3, K. Murata5, M. Tanaka5, H. Ito4, Y. Fujii3, T. Mimori1, Department of Rheumatology and Clinical Immunology, Kyoto University Hospital; 1Department of Human Health Sciences, Kyoto University Graduate School; 2Center for Rheumatic Disease; 3Department of Orthopedic Surgery, Kyoto University Hospital, Kyoto, Japan

Background: Because elbows are important joints for the function of upper limbs, the daily activity of the patients with rheumatoid arthritis (RA) may be impaired by synovitis of elbows. Although elbows are included into the 28 essential joints for evaluation of the disease activity of RA, ultrasonography (US) examination of elbows is not routinely performed and there have been a few surveys on the correlation between US scores of elbows and disease activity.

Objectives: To reveal whether there is a correlation between US scores of elbows and disease activity in the patients with RA.

Methods: We recruited 198 patients with RA form KURAMA cohort, which is the database of the patients with RA treated in the Kyoto University Hospital, and performed US examination of proximal interphalangeal (PIP) joints, metacarpophalangeal (MP) joints, wrist joints and elbow joints. Synovial hypertrophy is scored semiquantitatively on a scale of 0–3. We analysed correlations between the total scores of each component (PIP, MP, wrist and elbow) and clinical parameters.

Results: We found weak correlations between DAS28-ESR and the US scores of PIPs, MP joints and wrists (r=0.25, 0.21 and 0.29, respectively) whereas there was little correlation between DAS28-ESR and the US score of elbows (r=0.16). However, multivariable analysis showed that the US scores of PIPs, wrists and elbows were independently associated with DAS28-ESR (p=0.021, 0.0027 and 0.025, respectively). US scores of elbows showed little or weak correlations with US scores of PIPs, MP joints and wrists (r=0.23, 0.16 and 0.11, respectively).

Conclusions: US examination of elbows may be useful to assess the disease activity of patients when combined with US examination of PIPs and wrists although US scores of elbows alone has a weak correlation with DAS28-ESR. US examination of elbows may detect the disease activity which is overlooked by the US examination of joints of hand.