SAT0201 IMPROVEMENT OF MYOSITIS OSSIFICANS CIRCUMSCRIPTA DIAGNOSIS BY MAGNETIC RESONANCE IMAGING

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Background Myositis ossificans circumscripta (MOC) is a focal benign heterotopic ossification in musculoskeletal tissues, often occurring in young adults. Early stages of MOC may be mistaken for infection or malignancy. Since magnetic resonance (MR) imaging has now a key role in the diagnosis of soft tissue masses, MR features of MOC have to be recognised.

Objectives To compare the different features of MOC, as shown by the different imaging modalities (plain radiographs, computed tomography (CT) and MR examinations).

Methods 19 cases (M/F: 0.9, mean age: 32 years) of MOC from several hospitals in Paris were retrospectively studied with a special focus on imaging features. Diagnosis of MOC was based upon clinical and radiological criteria. Pathological examination was also obtained for 6 patients. The lesions were analysed for margin definition, MR signal intensity, surrounding oedema and contrast enhancement.

Results Post contrast enhancement was observed in the peripheral typical rim-like ossification, whatever the stage of the MOC. Enhancement of the calcified rim in mature lesions was an unexpected finding, since, to our knowledge, no mature calcified or ossified musculoskeletal lesions disclose such enhancement. The surrounding oedema was frequently observed on CT or RM examinations. It appeared in 3 patients as uncommon concentric intramuscular streaks. Oedema extension did not correlate with the early or mature stage of MOC. Synovitis or articular effusion were seen for 4 patients when MOC was located close to a joint.

Conclusion In this study, imaging patterns of MOC, specially MR imaging, could be analysed. Interestingly, original findings could be observed, which could help early diagnosis, thus avoid needless invasive procedures.

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SAT0202 SHORT-TERM EROSION PROGRESSION ON MAGNETIC RESONANCE IMAGES IS HIGHLY CORRELATED WITH LONG-TERM RADIOGRAPHIC PROGRESSION IN RHEUMATOID ARTHRITIS WRISTS

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Background

Objectives In patients with rheumatoid arthritis (RA) to compare the development of wrist joint bone erosions on conventional radiography (CR) performed annually for 5 years with erosions

detected by magnetic resonance imaging (MRI) at baseline and 1-year follow-up.

Methods Fifteen patients with RA (disease duration 0.5-20 years, median 1.5 years) were followed for 5 years. MRI of the dominant wrist was performed at year 0 and 1, and CR at years 0, 1, 2, 3, 4 and 5. In each image set, the number of wrist bones (metacarpal bases, carpal bones, radius and ulna) with erosions was determined.

Results The number of bones with erosions detected by CR and MRI at the different time points are shown in the Table 1. The total number of CR-erosions at baseline and after 5 years, compared with the number of MRI-erosions at baseline, were 21% and 64%, respectively.

The MRI-erosion score at 1 year was the parameter from the initial 1 year of follow-up, that showed the closest statistical correlation with the radiographic erosion score at 5 years ($\rho = 0.67$, $p = 0.006$), while corresponding correlations for radiographic erosion scores at baseline and 1 year were $\rho = 0.41$ ($p = 0.12$, NS) and $\rho = 0.60$ ($p = 0.02$).

The erosive progression rate on radiographs during the 5 years (CR 5 minus CR 0) was significantly correlated with the MRI erosive progression rate during the initial year (MRI 1 minus MRI 0) ($\rho = 0.64$, $p = 0.01$), and, more weakly, with the corresponding 1-year radiographic progression rate ($\rho = 0.56$, $p = 0.03$).

Abstract SAT0202 Table 1

	MRI 0 (baseline)	MRI 1 (year 1)	CR 0 (baseline)	CR 1 (year 1)	CR 2 (year 2)	CR 3 (year 3)	CR 4 (year 4)	CR 5 (year 5)
Number of bones with erosions	89	108	19	28	32	44	47	57
% of erosions at MRI 0	-	-	21%	31%	36%	49%	53%	64%

CR: conventional radiography; MRI: magnetic resonance imaging.

Conclusion In the present study, short-term (1-year) MRI progression was highly significantly correlated with long-term (5 year) erosive progression. The study suggests that MRI is more useful than radiography itself for prediction of long term radiographic joint damage in rheumatoid arthritis.

SAT0203 VALIDATION OF A NEW SINGLE-PHOTON SYSTEM OF RADIOABSORPTIOMETRY OF THE PHALANX FOR MEASUREMENT OF BONE MINERAL DENSITY

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Background A new method for the measurement of bone density of the phalanx using digitised conventional X-ray films of the hand has been developed in our centre.

Objectives To test the reliability and internal validity (test-retest) of this method, especially regarding the digitalisation process

and the software developed for segmentation and optical density analyses.

Methods The non-dominant hand is radiographed together with an aluminium wedge used for calibration and correction of the variability associated with the XR technique and digitalisation process. A single exposure at 46 kV is performed and the resulting film is read with an AgfaScan T1200 device with predefined settings.

Results To assess the reproducibility of our technique, XR hand films of 17 patients were scanned 5 times in different days. CV was found to be 0,913 (95% CI 0,650–1,825) for the middle phalanx; 0,632 (95% CI 0,470–1,265) for the proximal phalanx; and 1,194 (95% CI 0,918–2,387) for the central area of the third metacarpal. A test-retest experiment with 2 films in 50 patients gave an almost perfect internal correlation (Pearson's R of 0,985; 0,995 and 0,986) for these same sites.

We also validated our technique in a sample of 171 women referred by general practitioners with a clinical diagnosis of osteoporosis. Construct validation was performed against conventional lumbar spine and hip DXA (Lunar DPX). Also, 78 of these women had a phalanx DXA measurement with a commercial device (AccuDXA).

Correlations between BMD in several sites are described below:

Abstract SAT0203 Table 1

	Prox Phal	MCP	Spine	Hip	AccuDXA	Age
Middle Phal	0,851*	0,755*	0,562*	0,565*	0,674*	-0,264
Prox Phal		0,845*	0,551*	0,580*	0,742*	-0,366*
MCP			0,548*	0,603*	0,713*	-0,430*
Spine				0,708*	0,510*	-0,385
Hip					0,623*	-0,495*
AccuDXA						-0,394*

Correlation among different BMD measurement procedures.

Conclusion The reproducibility and internal correlation of measurements made with our newly developed technique is very high for the three areas of the hand studied.

Correlation of BMD of the hand with BMD in the lumbar spine and hip is moderate and similar to that found among these places themselves.

SAT0204 INVESTIGATION OF FLUOROQUINOLONE-INDUCED MYALGIA USING 31P MAGNETIC RESONANCE SPECTROSCOPY AND *IN VITRO* CONTRACTURE TESTS

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Background Adverse rheumatological effects of fluoroquinolone treatment such as tendinopathies, arthralgia and myalgia have been reported. The exact mechanism of fluoroquinolone toxicity remains unclear.

Objectives To investigate muscle function in patients suffering from severe myalgia resulting from fluoroquinolone treatment. We used histology, *in vitro* contracture tests (IVCT) and 31P magnetic resonance spectroscopy (31P MRS) to explore muscular contraction and metabolism.

Methods Three patients were investigated suffering after fluoroquinolone treatment from myalgia, hyperalgia tendinopathy and arthralgia. Control group included nine subjects, all of them were free of any muscle disease.

Muscle biopsies were performed on the left biceps, IVCT were performed in accordance with the protocol recommended by European Malignant Hyperpyrexia Group (EMHG). 31P MRS concited to MR spectra of forearm flexor muscles were recorded at 4.7 T throughout a rest-exercise-recovery protocol.

Results No specific histologic anomalies were observed in muscle biopsies. *In vitro* contracture tests diagnosed one patient as susceptible to Malignant hyperthermia. 31P MRS detected in all patients a significant reduction of pH magnitude changes measured at end of exercise and a faster rate of proton efflux measured during recovery.

Conclusion Muscle abnormalities described in the present study of three patients after fluoroquinolone treatment clearly pointed out the organicity of fluoroquinolone-induced myalgia. All three patients displayed an acceleration of proton efflux and a limited acidosis likely in relation with changes of transporters involving in the transport of Na⁺, H⁺ and Ca²⁺.

SAT0205 OSTEOPOROSIS: A NEW METHOD OF SCREENING

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Background

Objectives Usefulness of calcaneus densitometry as a method of screening in osteoporosis.

Methods Study of 69 women with osteoporosis, with DMO (L2-L4, Ward) and a comparison of the results obtained with a calcaneus densitometry (photonic dual measure, Lunar PIXI model). We considered osteoporosis when we find -2.5 SD in DMO and -1.6 SD in the calcaneus densitometry.

Results After comparing the DMO lumbar results and DMO Ward, individually, with results of calcaneus densitometry, we observed a coefficient correlation of 0.5 and 0.6 respectively.

Conclusion In our study the measures of the calcaneus densitometry have a relation to DMO, then we could consider it as a method of screening with patients we suspect of a osteoporosis.

SAT0206 DYNAMIC MAGNETIC RESONANCE IMAGING OF THE WRIST: A COMPARISON OF PATIENTS WITH ACTIVE RHEUMATOID ARTHRITIS, RHEUMATOID ARTHRITIS IN REMISSION, AND PSORIATIC ARTHRITIS

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Background Objective quantification of synovial membrane inflammation is an important goal of rheumatology research. Recently, magnetic resonance imaging (MRI) has been used to evaluate synovitis in rheumatoid arthritis (RA).^{1,2}

Objectives Our work is concerned with an evaluation of synovitis in patients with active RA, RA in remission, and psoriatic arthritis (PsA) in comparison with normal controls (CO).