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).

Methods 16 patients with RA according to the 1987 ACR criteria, of whom 5 were in complete clinical remission, 6 patients with PsA, and 2 CO were studied. MRI was performed with a 0.2T dedicated device (Artoscan, Esaote, Genova, Italy). The sequence used was a Spin Echo (TR/TE = 100/16 ms, matrix = 160 × 128, FOV = 50 × 150, slice thickness = 5 mm). A bolus of 0.2 ml/kg of gadopentetate dimeglumine was injected intravenously and fast images of three slices of the wrist were repeated every 20 s thereafter. The enhancement ratio was calculated both as rate of early enhancement (REE) and as relative enhancement (RE). The signals from a small circular ROI in the region of maximal enhancement and from a larger segmented region including most of the enhanced synovial membrane were evaluated. The signal was normalised to the bone to reduced noise.

Results Both REE and RE were significantly higher in active RA vs. inactive RA ($p = 0.003$), PsA ($p = 0.002$), and CO ($p = 0.0002$). In addition, RE and REE were higher in inactive RA than in CO ($p = 0.008$). Results from the analyses using the small ROI and the segmented ROI showed a good correlation (mean $R = 0.75$). REE resulted slightly more sensitive than RE.

Conclusion Dynamic MRI is a useful method to evaluate synovitis by allowing quantitative estimation of the synovial enhancement. This promising technique is able to differentiate active from inactive RA, as well as RA from PsA and CO. The evaluation of a small area of the synovial membrane seems to be equally effective than the more time-consuming segmentation.

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SAT0207 DETERMINATION OF SYNOVIAL INFLAMMATION IN THE WRIST BY DOPPLER ULTRASONOGRAPHY AND MRI IN PATIENTS WITH ARTHRITIS

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Background Synovial membrane volumes obtained by Magnetic Resonance Imaging (MRI) have been suggested as a marker of joint disease activity.¹ Graded power Doppler images has been able to detect treatment response in joint synovium.² If ultrasonographic (US) parameters correspond with findings in MRI an alternative method in assessing inflammatory activity would be available.

Objectives To compare the evaluation of signs of synovial activity in patients with arthritis as determined by MRI and DUS respectively.

Methods 11 patients (5 women and 6 men, median age 52,6 years, range (32–69)) with arthritis were included. All patients were examined by DUS with a 15 MHz linear transducer and by 1.5 T MRI before and after contrast injection. The area and thickness of the synovial membrane were outlined after contrast injection on MRI. US flow pattern of the synovium in the wrist was evaluated by quantitative spectral DUS ($n = 10$), recording resistance index (RI). The relative RI (rRI) = meanRI/extra synovial RI, was calculated to adjust for changes in peripheral resistance unrelated to the joint. The synovial vascularisation was determined by colour Doppler ($n = 10$). Using a colour recognition function, all marked pixels were changed to a reference

colour and the total amount of pixels finally depicted using a colour histogram.³

Each patient was evaluated by ESR, CRP and joint assessment.

Results The colour Doppler pixel (CDP) measurements correlated significantly with both max area and thickness of the synovial membrane on post contrast MR images ($R_s = 0.88$ and 0.84 , $P < 0.002$). Also the rRI values correlated significantly with both max area and thickness of the synovial membrane on post contrast MR images ($R_s = 0.89$ and 0.93 , $p < 0.001$). Kappa statistics were made on MRI and DUS: Kappa was 0,8 between the max area and thickness of the synovial membrane on post contrast MR images and the CDP measurements. Kappa was 1,0 between the max area and thickness of the synovial membrane on post contrast MR images and the rRI values. No correlation was found between ESR, CRP and joint assessment and the imaging modalities.

Conclusion The estimation of synovial inflammatory activity on DUS was comparable with post contrast MRI. DUS appears to be an alternative method to determine inflammatory activity in patients with rheumatic diseases.

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SAT0208 THE PREDICTIVE ROLE OF BONE SCINTIGRAPHY IN OSTEOARTHRITIS, RELATIONSHIP WITH AGE AND SEVERITY OF THE DISEASE

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Background Osteoarthritis (OA) is the most common cause of musculoskeletal diseases in the developed countries. The diagnosis of OA is usually dependent on clinical and radiological evaluations which have some limitations in measuring the outcome.

Objectives The aims of this study were to evaluate the predictive role of bone scintigraphy in OA, and to study the relationship with age and severity of the disease.

Methods Ninety-nine female subjects were included in this study. Conventional x-rays of the hand, knee, hip and lumbar regions were obtained from each subjects. According to Kellgren and Lawrence Grading System the radiological score of the joint which had the highest grade was accepted as the Maximum Radiological Score (MRS). A bone scan was performed for each subjects 4 h after the injection of 740 MBq of technetium ^{99m}-MDP. Spot images of hand, knee, lumbar vertebrae and pelvis were acquired using a gamma camera (Toshiba GCA 601). Besides the increased or normal uptake of activity at the affected joints, the ratios of lesion/non-lesion were also calculated. In the areas where the increased uptake of activity were present, the maximum lesion/non-lesion ratio was accepted as Maximum Scintigraphic Score (MSS). According to the American College of Rheumatology- clinical and radiological ? criteria for diagnosis of OA 46 patients were included in OA group (Group 1) and