On US, 63 patients (88.7%) were classified as eroded. On US, erosions prevailed at baseline in MTP5 joints, then MCP2 and MCP5 joints on their lateral facets. During follow-up, 28 patients (39.4%) were classified as US progressors, 30 (42.3%) were stable and 13 (18.3%) considered as regressors (figure 1). In early RA disease, three of the four non eroded patients became eroded. USSe progressed in 11 patients (50%) while regression was observed in only one patient. In late RA disease, 17 patients (34.7%) progressed and 12 patients (24.5%) decreased significantly their USSe. Erosion progression prevailed on MTP 5 joints followed by MCP2 and finally MCP5 joints (figure 2).

Figure 1. USSe progression plots (n=71)

Figure 2. Differences of USSe by joints during follow-up in early and late RA

Conclusion: US structural examination is a highly reproducible method to assess erosion in RA disease. The USSe is able to detect structural changes (progression, stabilization and regression) in RA patients during a follow-up of two years especially in RA patients with short disease duration.

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Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.2444

AB1126

THE RELIABILITY AND DIAGNOSTIC ACCURACY OF DIGITAL TOMOSYNTHESIS COMPARED WITH CONVENTIONAL RADIOGRAPHY FOR THE INVESTIGATION OF SACROILIITIS

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Background: Conventional radiography remains part of the diagnosis of axial spondyloarthritis and determines qualification for biologic disease modifying anti-rheumatic drugs in many countries. The standard anteroposterior radiograph (XR) incompletely images the complex sacroiliac joint with recognised unacceptably low levels of agreement between readers. Digital tomosynthesis (DTS) uses conventional radiographic projections to create a three-dimensional image and is a potential alternative for the initial radiographic detection and grading of sacroiliitis.

Objectives: To compare the level of agreement between two radiologists when reporting sacroiliac joint imaging with digital tomosynthesis versus conventional radiography, as well as to compare the diagnostic accuracy of each imaging modality.

Methods: 229 consecutive patients that had radiography and digital tomosynthesis performed at Footscray Hospital, Melbourne, Australia were included. Two blinded radiologists independently re-reported all images according to the modified New York criteria, or listed an alternative diagnosis. An overall assessment of each image as inflammatory sacroiliitis, normal or non-inflammatory disease was also recorded. Demographic and clinical data were extracted from medical records. Agreement between and within readers was evaluated using kappa (κ) statistic. Diagnostic accuracy was calculated by comparing each reader's overall assessment against 2 reference standard comparators: most recent rheumatologist diagnosis and fulfillment of ASAS criteria at any time point.

Results: The intra-reader agreement of reader 1 was almost perfect for the left, right and overall sacroiliac joint assessments (κ 0.77 - 0.94), with DTS outperforming XR. Reader 2 agreement was mostly moderate (κ 0.39 - 0.69), with DTS and XR better on the left and right sacroiliac joint respectively, but XR having better overall assessment. The inter-reader agreement of DTS for all patients was moderate and better than XR as shown in the Table. When excluding non-spondyloarthritis patients, inter-reader agreement improved (κ 0.50 to 0.58) but there was no significant difference between DTS and XR. Using reader 1, the sensitivity of DTS (64.8 - 66.7%) was better than XR (54.9 - 60.7%) but low, in keeping with what is known about radiographic sacroiliitis and axial spondyloarthritis. The specificity of XR (78.5 - 80.3%) was better than DTS (72.3 - 73.1%). There were no significant differences when fulfillment of modified New York Criteria was used as a reader's positive test.

Table. Inter-rater reliability between the readers

	All patients (N=229)*	Inflammatory sacroiliitis & normal patients (N=164)**	Inflammatory sacroiliitis patients (N=92)**
XR Right	0.36	0.52	0.56
DTS Right	0.39	0.50	0.51
XR Left	0.34	0.55	0.56
DTS Left	0.42	0.55	0.58
XR Overall	0.40		
DTS Overall	0.45		

*Non-weighted kappa statistic

**Weighted kappa statistic

Conclusion: DTS demonstrated moderate reliability for assessment of sacroiliitis, marginally better than conventional radiography. Overall levels of agreement for both imaging modalities were however lower than radiography in previous studies, with several possible contributing factors. A prospective study in a selected spondyloarthritis cohort may better determine any benefit of DTS.

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Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.3521