Axial spondyloarthritis: on the interface between healthy and diseased

**Background:** Fatty lesions (FL), similar to bone marrow oedema (BME) and sclerosis (SCL), are characteristic finding in MRI examinations of patients with ankylosing spondylitis (AS) and degenerative disc disease (DDD). It has recently been shown that FL are associated with syndesmophyte formation in AS. The anatomic correlate of FL has not been studied to date. Current assumptions are solely based on non-invasive data.

**Objectives:** To examine the cellular composition of FL in the edges of vertebral bodies of patients with AS or DDD by histology.

**Methods:** Patients with AS or DDD undergoing planned kyphosis correction surgery by spinal osteotomy (in AS) or surgery to correct spinal stenosis (in DDD) were included into this biopsy study. The spinal surgeon (HB) took all biopsies mainly in the area close to the vertebral edge in many of which FL had been seen by MRI (figure 1a for AS and 1b for DDD). Biopsies were decalcified, embedded in paraffin, cut and stained by hematoxylin and eosin. The marrow composition was analysed and the cellularity graded (% surface area) by two different investigators blinded to patients’ diagnosis. Four different marrow compositions could be differentiated: (i) fat, (ii) fibrosis, (iii) inflammation and (iv) hematopoiesis (normal).

**Results:** A total of 60 biopsies mostly obtained from the lower thoracic spine and the lumbar spine of 21 AS patients (mean age 51.7 years, mean disease duration 24.6 years) and of the lumbar spine in 18 DDD patients (mean age 60.1 years, mean disease duration 6.4 years) were available. On the patient level, the histological appearance of MRI-FL was found to have at least 3 positive spinal lesions in any spinal region. In comparison, the prevalence of FL was higher (36.7% in the cervical, 72.4% in the thoracic and 52.7% in the lumbar spine). Overall, 86.5% volunteers were found to have ≥3 positive spinal lesions in any spinal segment. Logistic regression analysis showed that age was the only demographic characteristic that independently contributed to the occurrence of both BME (RR=1.22, 95% CI: 1.03 to 1.46, p<0.025) or FL (RR=1.12, 95% CI: 1.07 to 1.19, p<0.001).

**Conclusions:** In this large population-based study with healthy volunteers a relatively high prevalence of inflammatory and structural MRI lesions was found. Whether these lesions are to be explained by mechanical stress needs to be further studied. The high prevalence of BME and FL in the axial skeleton in the general population indicates a limited diagnostic value of these MRI findings. Thus, those should be interpreted with caution in relation to diagnosis, classification and assessment of disease activity.

**REFERENCES:**

**Disclosure of Interest:** None declared

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