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MR Imaging of Arthritis

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When an arthritic process is well established, it will usually achieve a typical appearance, which allows diagnosis by means of radiography, however, it is not seen in rheumatic diseases until late in the disease. We are now diagnosing arthritic processes at an earlier stage, prior to any radiographic change utilizing MRI. The benefit of early diagnosis is obvious, yielding longer patient productivity and decreasing the need for arthroplasty. Moreover, recent research indicates that the therapeutic management, including medication and therapy monitoring, has to be adapted for each type of arthritis. Hence, differential diagnosis of rheumatic disorders is important issue in daily practice.

The Outcome Measures in Rheumatology (OMERACT) Rheumatoid Arthritis (RA) Magnetic Resonance Imaging (MRI) scoring system (RAMRIS), evaluating bone erosion, bone marrow edema/osteitis, and synovitis, was introduced in 2002, and is now the standard method of objectively quantifying inflammation and damage by MRI in RA trials. Technical improvements, including higher field strengths and improved pulse sequences, allow higher image resolution and contrast-to-noise ratio. These have facilitated development and validation of scoring methods of new pathologies: joint space narrowing and tenosynovitis.

Axial spondyloarthritis (SpA) is a chronic rheumatic disease characterized by inflammatory back pain and several other disease manifestations and comorbidities. Assessment in SpondyloArthritis International Society (ASAS) classification system utilizes imaging features of the sacroiliac joints on MR imaging to assist in characterizing the presence of sacroiliitis: bone marrow edema or bone marrow contrast enhancement. Important differential diagnoses include diffuse idiopathic skeletal hyperostosis and osteitis condensans. A negative examination of the pelvis on MRI bears the risk of a delayed diagnosis because radiographs cannot exclude the possibility of SpA. MRI is the imaging modality of choice for the detection of early inflammatory spinal and sacroiliac lesions in SpA. Inflammatory changes in the sacroiliac joints and the spine can be detected by MRI before they can be seen by radiographs or computed tomography. Therefore, MRI is established as the most sensitive imaging modality for the early detection of axial SpA.

In two cohorts of patients with chronic back pain of less than 3 years duration, spinal inflammation in the absence of sacroiliitis was observed in only 1– 2% of patients, resulting in marginal impact on classification according to the ASAS criteria. Caution is warranted if a suspicion of SpA is based on spinal MRI alone, which is often the only examination when imaging for back pain is ordered in daily routine.

In this lecture, typical imaging findings of rheumatic diseases will be discussed along with those of important differential diagnoses.

Keywords: Rheumatoid arthritis; RAMRIS; Axial spondyloarthritis, ASAS