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Novel imaging modalities in spondyloarthritis

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A B S T R A C T

Novel imaging techniques have emerged in the field of spondyloarthritis. This article will cover the role of, and the sensitivity and specificity of magnetic resonance imaging (MRI) and ultrasound in the diagnosis and monitoring of axial and peripheral SpA. It will discuss how the definition of a 'positive MRI' of the sacroiliac joints and spine is evolving. Differential diagnoses of inflammatory lesions of both the sacroiliac joints and the spine are addressed due to their importance in image interpretation. The article will also discuss the role of sonography in assessing peripheral entheses, joints, tendon sheaths, nails and soft tissues. The utility for clinical as well as an outcome measure will be discussed. We finally aim to give guidance on when and how to use these new modalities and on how to analyse and interpret the imaging findings in daily practice.

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Practice points

- Imaging is important in early diagnosis of spondyloarthritis
- MRI plays a key role in diagnosis and classification of patients with axial spondyloarthritis
- Ultrasound shows arthritis, enthesitis and dactylitis in patients with peripheral spondyloarthritis

Research agenda

- A more stringent definition of a positive MRI' may decrease false positive diagnosis of spondyloarthritis
- Developing validated ultrasound arthritis, enthesitis and dactylitis scoring systems as outcome measures according to the OMERACT filter.

Introduction

Seronegative axial spondyloarthritis (SpA) is a chronic inflammatory disease that affects the sacroiliac joints (SIJs) and the spine [1–5]. Peripheral manifestations of SpA include arthritis of synovial joints in the appendicular skeleton, enthesitis or dactylitis. On average, axial SpA remains undiagnosed for up to 7 years from the onset of clinical symptoms. There is an ongoing debate about the appropriate imaging approach in patients with suspected or confirmed SpA. As magnetic resonance imaging (MRI) of the SIJs enables the early diagnosis of axial SpA, its use in clinical practice has increased dramatically during the last decade [1]. Sonographic evaluation of non-axial manifestations of spondyloarthropathy may aid in diagnosis and may have a role as an outcome measure. In the following article, we will discuss utility of ultrasound in imaging the joints, entheses, soft tissues and digits of patients with spondyloarthropathy.

MR imaging

A thorough knowledge of normal imaging findings, typical features in SpA, and the differential diagnosis are crucial in image analysis and interpretation. This article presents recommendations for the use and interpretation of MRI and ultrasound in SpA based on expert opinion and on literature review.

Why should we image?

Axial SpA can be distinguished on the basis of patient history and typical clinical and laboratory findings. Patients with inflammatory back pain with an insidious onset of symptoms, <45 years of age and a duration of at least 3 months should initially be imaged with radiography, according to the Assessment of SpondyloArthritis Society (ASAS) criteria [4].

The ASAS classification criteria for axial SpA consists of two arms, an imaging arm and a clinical arm, both considered equally important [4]. The key feature in the imaging arm is sacroiliitis, either diagnosed by MRI in the nonradiographic stage, or by radiographs in the radiographic stage. We should be aware that SpA may remain undiagnosed if only radiographs are obtained, as a negative study does not exclude SpA. If radiographs are negative in patients with a suspicion of SpA, MRI may detect early inflammatory lesions in the nonradiographic stage of the disease (Fig. 1) [6]. MRI enables confirmation of a diagnosis of early SpA, suspected on the basis of clinical aspects, as early as 4 months after symptom onset [7]. MRI is established as the most sensitive imaging modality for the early detection of axial SpA since active and structural lesions in the SIJs and the spine can be detected by MRI long before they become evident on radiography [8]. Early inflammatory changes may lead to later structural changes, with only structural damage visible on radiographs.

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