

# Harnessing Imaging to Improve Diagnosis and Treatment of Rheumatic Diseases

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Imaging methods allowing us to look into the human body and enhance our anatomic and pathologic knowledge have been used as an extension of clinical assessment since radiography was first developed more than 100 years ago. The optimal imaging modality should facilitate an early, sensitive, and specific diagnosis; cover multiple disease target sites, not involve ionizing radiation; and at the same time be quick, accessible, and relatively inexpensive. The main imaging modalities currently available are X-rays, computed tomography (CT), ultrasound, nuclear medicine including positron emission tomography (PET), and magnetic resonance imaging (MRI).

The role of imaging in the diagnosis, management, and follow-up of patients with suspected or known rheumatologic diseases has gained an increasingly important role over the past decade, especially with the introduction of biologic therapies. These agents, each with their novel mechanism of action, have changed the treatment paradigm making low disease activity and remission a realistic therapeutic goal. Their enhanced efficacy led to targeted radiographic remission on top of a clinical one in addition to their utilization in early

disease to improve treatment outcomes and reduce long-term disability.

A radiology-rheumatology meeting focusing on the contribution of imaging to the understanding of the pathogenesis and treatment decisions in musculoskeletal rheumatic diseases took place in December 2016 at the Sheba Medical Center, Tel Hashomer, Israel. Several lectures focusing on lessons learned from imaging in different fields of rheumatology were given. Some of these lectures are presented in the current issue of *IMAJ*.

Ultrasound as a dynamic imaging technique is capable of visualizing both the morphology and the function (i.e., inflammatory activity) of the structure under evaluation. The role of ultrasound in the diagnostic workup, the monitoring of disease activity, and the definition of remission in rheumatoid arthritis was presented by D'Agostino [1].

MRI is currently considered the most sensitive and accurate diagnostic tool for the evaluation of early spondyloarthritis (SpA), by which the two main components of the disease, the active inflammatory and the structural damage, can be reliably assessed. Baraliakos [2] reviewed contemporary perspectives on developments and advancements in the field of SpA imaging and gave a detailed overview of the benefits and limitations of available imaging techniques in patients with axial SpA. The role of MRI in identifying alternative diagnoses to sacroiliitis, the main target area of SpA, is also presented in the current issue [3].

Enthesitis, representing inflammation at the insertion of a tendon or a ligament to a bone, is considered a hallmark of the SpA diseases, which include ankylosing spondylitis (AS), psoriatic arthritis (PsA), inflammatory bowel related arthritis, and

reactive arthritis. A detailed review on the lessons learned from imaging (specifically MRI) on enthesitis in PsA, including its relationship to dactylitis and psoriatic nail disease, was presented in the meeting by McGonagle and is summarized in the current issue by an article by Watad and co-authors [4]. Two additional manuscripts in the current issue reflect the importance of imaging in diagnosing enthesopathy in rheumatic diseases [5,6].

To summarize, promising new techniques in the field of rheumatology imaging are constantly emerging. The recognition of imaging patterns and distribution facilitates early diagnosis and allows for prompt initiation of remission-targeted therapy. In addition, these techniques allow for a better understanding of disease pathogenesis as well as the development of disease specific imaging biomarkers, which will ultimately further improve outcomes.

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