Rheumatoid Arthritis Atlas Opens Door for MRI

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The availability of a newly released set of standard magnetic resonance reference images may usher in even greater use of the technology in the evaluation of patients with rheumatoid arthritis.

The European League Against Rheumatism–Outcome Measures in Rheumatoid Arthritis Clinical Trials (EULAR-OMERACT) MRI reference image atlas published in February is intended to improve the performance and generalizability of the MRI scoring system previously developed by the group (Ann. Rheum. Dis. 2005;64 [suppl. 1]:i1-155). In 2002, OMERACT released the Rheumatoid Arthritis MRI Score (RAMRIS) for the evaluation of inflammatory and destructive changes in RA hands and wrists.

Intended for clinical researchers, but also translatable as an educational tool for practicing physicians, the atlas is composed of 1,002 representative images of synovitis, bone erosion, and edema in the metacarpophalangeal and wrist joints.

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The document displays all severity grades of synovitis in the metacarpophalangeal joints and in each of the wrist joint areas. In addition, it maps out various severity grades of bone erosion and edema in the metacarpal head and phalangeal base and in five selected wrist joint bones (distal radius, scaphoid, lunate, capitate, and metacarpal base). For each individual grade, the atlas includes examples of both the "low" and "high" ends of the spectrum.

The collection of reference images provides a much-needed visual touchstone for MR assessment of RA, said Orrin M. Troum, M.D., of the University of Southern California, Los Angeles. "This is a positive step forward …I think ultimately we may be able to do away with x-ray."

A number of studies have demonstrated the superior sensitivity of MRI compared with conventional radiography, particularly in identifying early disease, which is crucial to improving outcomes for patients with aggressive disease. MRI has been shown to be two to nine times more sensitive than x-rays for the detection of bone erosion.

"It's been well documented that people with RA, if identified and treated earlier, do better," Dr. Troum said. MRI can make all the difference in the patient with aggressive RA because erosions can be visualized earlier, allowing treatment to be initiated and disease progression to be halted, which all leads to less disability later.

The advent of structure-modifying therapies gave rise to the necessity of MRI assessment in RA patients, said Charles Peterfy, M.D., a musculoskeletal radiologist and a coauthor of the atlas.

Before biologics, there was no real need to have such detailed information about joint structure, because having it didn't alter the course of clinical management. The availability of agents that halt disease progression changed everything, he said.

The challenge now is to identify those patients who will go on to develop aggressive disease before severe impairment sets in. It's estimated that "20%-40% of patients with early disease aren't going to progress," said Dr. Peterfy, who also is chief medical officer of Synarc, a San Francisco–based company that does MR imaging for clinical trials.

Treating these patients empirically with biologics would be much too expensive and would entail an unacceptable level of unnecessary toxicity.

MRI can help identify those with aggressive disease because the technique allows direct visualization and assessment of synovitis and bone edema, which is a probable precursor of bone erosion.

"In early disease, MR identifies the aggressive phenotype much more sensitively than x-ray or any other test does so far," Dr. Peterfy said.

MRI could potentially be used to monitor the effect of treatment, allowing physicians to adjust the dosage or change the treatment regimens altogether. ■