



Baseline (left) shows erosions in the 2nd and 4th metacarpal heads. They have healed on follow-up MRI (right).

MRI Improves Rheumatoid Arthritis Care

BY NANCY WALSH
New York Bureau

Supplementing standard x-rays with extremity magnetic resonance imaging for the in-office diagnosis and monitoring of patients with rheumatoid arthritis could significantly improve the quality of care, according to Dr. Norman B. Gaylis, a rheumatologist in Aventura, Fla.

With biologic therapy having rev-

olutionized the treatment of rheumatoid arthritis (RA), the key concern now is the early identification of erosive disease, Dr. Gaylis explained. "We're faced every day with the dilemma of which patients to put on a biologic agent. If you see erosions you are more likely to go with a biologic agent rather than staying with a conventional disease-modifying drug."

But early erosions and other early poor prognostic signs such as

bone edema and synovial inflammation extending into bone and marrow cannot be visualized on standard x-rays. By the time these erosions can be seen radiographically it's too late—the damage has been done, he said.

Unlike x-ray, magnetic resonance imaging can detect early bone changes, where marrow is being replaced by inflammatory synovial tissue, a process that results in penetration of the cortical barrier, invasion of the cortical bone, and exposure of the marrow to inflammatory triggers (J. Immunol. 2005;175:2579-88).

That MRI is more sensitive than radiography for detecting synovitis and marrow edema is not in question. However, the conventional large-magnet high-field machines are typically used in hospital diagnostic facilities and are impractical for day-to-day-use in rheumatology, Dr. Gaylis said in an interview. The recent introduction of smaller, less expensive, in-office MRI units designed for use on the extremities eliminates these obstacles to access.

Studies have shown that the results obtained with these extremity MRIs in the evaluation of rheumatoid hands are equivalent to those obtained with the standard units. In one study that compared extremity low-field MRI with conventional MRI and radiography, sensitivity and specificity for both types of MRI read by more than one radiologist exceeded 90% (Ann. Rheum. Dis. 2005;64:1280-7).

The American College of Rheumatology (ACR) has remained skeptical about the utility of extremity MRI for RA. In a white paper 2 years ago, ACR indicated that, in their view, more work needed to be done to establish its validity.

Two central questions raised by the naysayers, according to Dr. Gaylis, are whether the MRI findings, invisible on x-rays, are indeed erosions, and whether these MRI findings are consistently reproducible.

An answer to the question of whether MRI-detected erosions and edema are valid signs of early RA, however, was recently shown in a study in which patients scheduled for joint replacement surgery underwent MRI the day before surgery. Following removal, sequential sections of the joint were analyzed histologically for bone marrow changes. The erosions and edema that had been detected on MRI clearly correlated with inflammation of the bone marrow and synovium (Arthritis Rheum. 2007;56:1118-24).

Extremity MRI also encourages adherence to therapy. The situation is very similar to what happened with bone densitometry for osteoporosis. "When bone density measurement first was available, the only treatment for osteoporosis was calcium as well as the off-label use of medications such as sodium fluoride and etidronate disodium. Since bone densitometry was introduced, there has been an explosion of new medicines. We also have learned to make the diagnosis earlier and to more closely monitor disease activity, and it has certainly helped with patient compliance," Dr. Gaylis said. Patients will be much more inclined to continue taking their medication if they can see concrete results, he said.

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