

Letters to the Editor

To the Editor:

As a radiologist specializing in orthopaedic MRI, I read with great interest the article entitled "Magnetic Resonance Imaging Assessment of the Rotator Cuff: Is It Really Accurate?" by Wnorowski et al. in the December 1997 issue of *Arthroscopy*.

The debate about the utility of MRI for the evaluation of the shoulder continues to divide sharply along party lines. Radiologists write articles proclaiming its utility and accuracy while orthopaedic surgeons publish articles indicating its lack of utility and accuracy. This letter is not intended to add to that argument. However, I would like to review some of the images that were part of that article.

The images provided in Fig 1 were incorrectly interpreted by the radiologist. It is a basic tenet of orthopaedic MRI that rotator cuff tears have increased signal on T2-weighted scans. The T2-weighted scan in this case is 1A. As stated in the caption there is, "normal signal within the supraspinatus tendon . . ." indicating that there is no tear. Figure 1B, a T1-weighted scan, shows increased signal intensity within the supraspinatus tendon. This increased signal, if abnormal at all, represents degeneration or inflammation and not a tendon tear.

Figure 2 shows case 8. These images clearly show a large, partial tear of the distal supraspinatus tendon near its insertion into the greater tuberosity. In addition, there is a significant amount of fluid in the subdeltoid bursa, which outlines the bursal side of the tendon. More proximally, the supraspinatus tendon is discontinuous. The findings of fluid in the bursa and the discontinuity of the tendon more proximally are highly suggestive of a combination of partial- and full-thickness tendon tears.

Figure 6 shows images of case number 3. Image A clearly shows a large area of abnormal signal intensity on T2-weighted scans within the distal supraspinatus tendon. There appears to be a band of low-signal intensity extending along the bursal side of this abnormal fluid collection, which probably represents an intact layer of cuff tissue. This may explain why no tear is identified on the bursal side of the tendon. In addition, the T1-weighted scan seen in Fig 6B shows thickening of the tendon suggesting chronic tendinosis. This may explain why this sizeable lesion also does not extend to the joint surface of the tendon. While the lesion seen on the T2-weighted scan may not be visually identifiable, it is clearly abnormal and in all likelihood would have been found had the tendon been dissected.

As in any other area of medicine, the expertise of the radiologist interpreting these studies varies greatly. Use of a 1.5 super-conducting MRI to obtain images in multiple planes does not assure the adequacy and

accuracy of the MRI examination. Orthopaedic MRI requires the intensive interest of the radiologist to not only interpret the scans but to see that they are performed correctly. Unfortunately, too often neither of these objectives is met. Something as simple as incorrectly filming the cases can preclude an accurate diagnosis. It is necessary for the orthopaedic surgeon to be knowledgeable enough about MRI to evaluate and demand excellence in both of these areas. If a significant percentage of MRI interpretations are discordant with the arthroscopic diagnosis, it is not the fault of the technology.

It is also incumbent upon orthopaedic surgeons to provide the radiologist with appropriate clinical and surgical follow-up. Only this way will we know whether or not we are correctly interpreting these cases. Even requesting follow-up with each report, I, unfortunately, receive almost none. I would encourage each surgeon to provide their radiologist with both negative and positive feedback when indicated. This is invaluable and should help correct unacceptable interpretations that limit the utility of this extraordinary technology.

Sincerely,
Robert A. Skib, M.D.
Tulsa, Oklahoma, U.S.A.

Author's Reply

In response to Dr. Skib's comments regarding our article entitled "Magnetic Resonance Imaging Assessment of the Rotator Cuff: Is It Really Accurate?" we make the following comments.

Dr. Skib said that Fig 1 was incorrectly interpreted. Figure 1A is a T2-weighted image showing fluid in the subacromial space. Figure 1B shows a region of increased signal in the rotator cuff. We believe that these findings are consistent with a rotator cuff tear. We agree that optimally there should have been a region of high signal within the tear seen best on T2-weighted images. That depends, however, on there being enough native joint fluid present to fill the tear. The absence of that finding only indicates lack of filling of the tear by synovial fluid. The finding of focal areas of high signal on T2-weighted images depends entirely on the presence of free fluid filling the gap created by the tear. It is for that reason that a saline (or gadolinium) enhanced examination increases the yield of positive results because we are providing fluid that may not have been adequately present before. If natural joint fluid does not fill the gap caused by the rotator cuff tear, the finding will be as we see in Fig 1B. That finding is a focal region of increased signal seen on T1-weighted images.

Dr. Skib said that the interpretation of Fig 2 was incorrect. He feels that there are partial and complete tears of the rotator cuff. We have difficulty with this interpretation. If there is a complete tear present, the findings will be as shown. Adjacent foci of abnormal cuff tissue may likely be present but calling that finding an incomplete tear is superfluous. We do

not believe that adding “partial tear” to the diagnosis of a complete tear is of diagnostic value.

There is criticism directed also at the interpretation of Fig 6. The findings show a complete fluid-filled gap indicating rotator cuff tear. The very thin band of lower signal tissue at the apex of the tear could represent scar or synovial tissue covering the bursal side of the tear. We do agree that complete cuff tendon dissection may have shown a tear missed at arthroscopy.

Dr. Skib has confidence in his MRI accuracy despite no mention of any clinical/surgical correlation with his interpretations. A strength of our study is that we correlated each MRI with the surgical findings. How, without correlation, can Dr. Skib know that his interpretations are accurate? Certainly the expertise of the radiologist is an important factor in accurately interpreting an MRI exam. One of our points in this article was that we compared the accuracy of community radiologists to a radiologist with special interest in musculoskeletal imaging and we concluded that the more experienced radiologist was more accurate.

Obviously, there remains lack of agreement on interpretation of these images. This illustrates the likelihood that we have not yet reached consensus on the radiographic definition of tears, and the range of variation of normal and degenerative nontorn rotator cuff images.

The bottom line is that the MRI interpretation of rotator cuff signal must be viewed with caution, and also with an increasing knowledge of the strengths and limitations of one's local radiographic capabilities. If there is doubt, an arthrogram or MRI saline contrast study may be useful, or if clinically warranted, proceed directly to an arthroscopic examination.

Sincerely,
Daniel C. Wnorowski, M.D.
E. Mark Levinsohn, M.D.
Syracuse, New York, U.S.A.

To the Editor:

I read with interest the article by Grelsamer et al.¹ and applaud their efforts to address various important issues pertaining to magnetic resonance imaging (MRI) of the knee and patellofemoral joint. Since our group developed the kinematic MRI technique for the assessment of patellar alignment and tracking in 1988² and, along with other investigators,³⁻⁹ continue to apply kinematic MRI to examine various normal and abnormal aspects of the patellofemoral joint,¹⁰⁻¹⁸ I feel compelled to offer my comments on their article.

First, while I agree that the normal position of the patella with the joint in a slightly flexed position (e.g., 5°) is centered over the underlying femoral trochlear groove, I recommend extreme caution regarding making statements pertaining to the position of the patella on routine MRI studies of the knee unless several factors related to positioning are carefully controlled and documented. In consideration that the study by