

# ORTHOPEDIC IMAGING: New Frontiers in Musculoskeletal MRI

By Jennifer Swart, M.D.



**AS** THE SUMMER DRAWS to a close, orthopedic injuries are a common reason for patients to seek medical attention. Magnetic resonance imaging (MRI) is a valuable tool in the diagnosis and management of these injuries. Whether the patient has a suspected meniscal tear in the setting of an acute anterior cruciate ligament (ACL) injury of the knee or a shoulder rotator cuff tear, MRI is a noninvasive method of evaluating the type and the extent of the injury. This evaluation aids the internist, emergency room doctor, sports medicine physician and orthopedic surgeon in the diagnosis and management of these patients' conditions.

Routine MRI of the knee, shoulder, spine and ankle remain the most common studies performed in those with orthopedic injuries. MR arthrography performed after the intra-articular injection of contrast is the standard of care in evaluating tears of the labrum in either the shoulder or hip and is excellent for imaging suspected intrinsic ligament tears in the wrist and elbow. These MR studies can be performed with either a 1.5 or 3 Tesla MR magnet, including the new, open-bore MRI magnets for patients who are claustrophobic or have a large body habitus. Obtaining an optimal MRI scan requires the radiologist to ensure protocols are optimized for the individual magnet, the appropriate study is performed to answer the clinical question, and the radiologist has the dedicated orthopedic imaging expertise to perform and interpret the study.

At South Texas Radiology Imaging Centers (STRIC), we are pushing the boundaries of orthopedic MRI with

the design and implementation of new MRI techniques and protocols to image patients with problems previously thought not amenable to imaging evaluation. These techniques have been used to image professional and high-end athletes, sports professionals, weekend warriors and young, school-age athletes.

One specialty technique is cartilage mapping. MRI is used to create T2 maps of cartilage to evaluate for early chondral degeneration or softening in those athletes who have pain and exhibit morphologically normal cartilage on standard MR pulse sequences. This helps assess patients at risk for future chondral damage.

Another recent important MR imaging advance is the development of STRIC's MARS (metal artifact reduction sequences) protocol, which can be used to image patients with orthopedic hardware, including hip and knee replacements. Metal implants had heretofore been a contraindication to MR imaging, so the development of this protocol has been particularly exciting. The MARS can be performed in patients with pain after joint replacement to assess for soft tissue complications surrounding the prosthesis, such as fluid collections, tendon avulsions or nerve injuries, as well as to assess for bony osteolysis due to small particle disease or metallosis. This has been invaluable in those patients with metal-on-metal hip replacements that have been recalled by manufacturers.

Other new advances in orthopedic MRI include a dedicated sports hernia protocol for male athletes with groin pain and athletic pubalgia, and an MR neurography protocol for those patients

with injuries, tumors or neuritis of peripheral nerves. These new protocols have expanded our ability to aid referring clinicians in the diagnosis and management of previously difficult to diagnose and image orthopedic conditions, and offer exciting new frontiers in the application of musculoskeletal MRI.

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*Dr. Swart has designed and implemented specialized MRI protocols for the evaluation of sports hernia injuries, nerve injuries and complications of joint prostheses. Dr. Swart is a member of the American Board of Radiology, the Society of Skeletal Radiology and the American Medical Women's Association. She was recently named a 2012 Texas Super Doctors Rising Star in Radiology by Texas Monthly Magazine.*

*For more information, please call South Texas Radiology Imaging Centers at (210) 319-4021, visit [www.stric.com](http://www.stric.com) or follow STRIC on Facebook. ■*



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