SUMMARY

MR imaging has revolutionized the evaluation of patients with soft tissue injuries about the knee. Much has been written about the ability of MR imaging to diagnose injuries noninvasively. Although the overwhelming majority of these reports support the role of MR imaging, their results are influenced by available equipment, imaging protocol, and study design.

The greatest impact of MR imaging is its ability to allow clinicians to manage their patients effectively in a cost-effective manner and improve the patient's quality of life.

Multiple different examination protocols are possible to evaluate ligamentous and meniscal injuries. Most protocols use T1-weighted, proton density, T2-weighted spin echo (SE), and T2*-Weighted pulse sequences or some combination. Fast spin echo (FSE) pulse sequences have been reported to be more technique dependent and less sensitive in diagnosis of meniscal tears than conventional SE pulse sequences. This is due to image blurring that occurs on FSE pulse sequences resulting in decreased ability to detect areas of abnormal signal. Inversion recovery or fat-suppressed spoiled T2*-weighted pulse sequences can be added to evaluate osseous or cartilage abnormalities. The exact pulse sequence used often depends more on user preference and system capabilities than some theoretical advantage or proven diagnostic superiority. A combination of axial, coronal, and sagittal imaging sequences is performed to evaluate the complex anatomy about the knee joint.

All types of subtle osseous injuries are well displayed on MR imaging. MR imaging can provide useful information about the osseous abnormalities as well as any associated soft tissue injuries.

MR imaging is an accurate, noninvasive, and cost-effective method for the evaluation of acute knee ligament injuries and in the examination of the postoperative knee. Understanding the normal anatomy and the pertinent clinical aspects of knee injuries is a prerequisite for accurate interpretation of MR imaging studies. The increasing popularity of ACL reconstruction following disruption of this ligament requires knowledge of the various surgical techniques and their MR imaging appearance as well as the appearance of possible complications.

MR imaging of the knee is highly accurate for the noninvasive diagnosis of meniscal tear and other meniscal pathology. Familiarity with the normal anatomy and common pitfalls reduces errant interpretations, but does not eliminate them entirely. The two MR imaging signs of a meniscal tear are abnormal intrameniscal signal on a short-TE image that unequivocally contacts the meniscal surface, and abnormal meniscal morphology in the absence of prior meniscal surgery. To help guide the treatment of meniscal injuries, which continues to evolve, the MR imaging report should throughly describe tears, and not simply indicate whether a meniscal tear is present.

In conclusion, MRI is considered the imaging modality of choice supplementing the physical examination in the evaluation of knee injuries. It is a simple, safe, easy and non-invasive technique allowing visualization of all structures within the knee joint.

MRI is recommend as a screening test prior to arthroscopy or arthrotomy to avoid unnecessary surgical intervention.