

Radiological Imaging and Knee Chondral Injuries

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This presentation will focus on the MRI imaging of articular cartilage injury in sport. Cartilage injuries can be acute, as a result of a direct impact or shear force. The classification and imaging appearances of acute cartilage injury will be described.

With developments in MR imaging there is increased interest in the early diagnosis of overuse or misuse cartilage disease in athletes, prior to the appearances of frank morphological damage. The goal of newer MR techniques is the detection of alterations in cartilage microstructure, particularly proteoglycan depletion and alterations in collagen content and function, to detect early disease. The goal of such detection is to identify vulnerable areas of cartilage, and either treat the underlying cause of that vulnerability, or design therapies that either prevent or slow disease progression.

New MRI techniques that assess GAG content include dGEMRIC, sodium imaging, chemical exchange saturation transfer. Techniques that are sensitive to alterations in cartilage water content and fibre orientation include T2 mapping, T1 rho, T2* mapping and diffusion weighted MR imaging. Many of these are currently research tools but some are beginning to appear on routine imaging protocols of newer MR systems. The advantages and disadvantages of these methods will be discussed.