MR imaging after Microfracture/Marrow Stimulation Techniques

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Marrow stimulation techniques include abrasion, subchondral drilling, and microfracture, of which microfracture remains the most commonly performed cartilage repair procedure (1). MR imaging is a noninvasive method to comprehensively assess the state of cartilage healing, allowing evaluation of the extracellular matrix, as well as the biochemical state of the repaired cartilage (2, 3, 4-7). The same MRI techniques that are used for evaluation of native cartilage should be used in evaluation of reparative cartilage, as recommended by the International Cartilage Repair Society (8). Intermediate-weighted fast SE and 3D fat-suppressed T1-weighted GRE sequences are most commonly used and usually a MR scanner of at least 1.5T magnet is required with a high-performance gradient system and a dedicated extremity coil (1). Parameters evaluated on MRI include degree of filling defect, morphologic characteristics of repaired tissue, presence of delamination, and extent of peripheral integration (1).

Tissue matrix at the repair site can be assessed using delayed gadolinium-enhanced MR imaging, T1 rho imaging (for glycosaminoglycan content), or T2 mapping (for collagen content) (2, 3, 4, 7). Recent studies have reported on the longitudinal follow-up imaging evaluation of microfracture surgery (9, 10).

References
7. Glaser C. New techniques for cartilage imaging: T2 relaxation time and diffusion-weighted
