

MR arthrography of acetabular cartilage delamination in femoroacetabular cam impingement.

Pfirrmann CW, Duc SR, Zanetti M, Dora C, Hodler J.; Radiology. 2008 Oct;249(1):236-41

PURPOSE: To retrospectively assess the frequency and performance of magnetic resonance (MR) arthrography to help diagnose acetabular cartilage delamination in femoroacetabular impingement (FAI).

MATERIALS AND METHODS: Institutional review board approval and informed consent were waived for this retrospective study. Forty-four consecutive patients with FAI of the cam type were included (mean age, 30.7 years; range, 16-49 years), including 30 men (mean age, 30.5 years; range, 16-49 years) and 14 women (mean age, 31.4 years; range, 18-48 years). The inclusion criteria were no previous surgery, surgery within 3 months after MR imaging, and availability of a detailed surgical report with acetabular cartilage findings. MR arthrographic findings were assessed independently by two blinded readers. Findings at surgery served as reference standard. Sensitivity, specificity, accuracy, and kappa statistics for interobserver agreement were calculated.

RESULTS: At surgery, acetabular cartilage delamination was seen in 23 (52%) of 44 patients (mean size of cartilage flap from acetabular rim, 7.6 mm; range, 2-30 mm). At MR, patients with fluid signal intensity under the cartilage delamination had a respective sensitivity, specificity, and accuracy of 22%, 95%, and 57% for reader 1 and 30%, 95%, and 61% for reader 2. A hypointense line in the acetabular cartilage on sagittal three-dimensional double-echo steady-state images with water excitation demonstrated moderate diagnostic performance (respective sensitivity, specificity, and accuracy were 70%, 57%, and 64% for reader 1 and 70%, 62%, and 66% for reader 2). Hypointense areas in the acetabular cartilage were quite specific on both coronal intermediate-weighted fat-saturated images (respective sensitivity, specificity, and accuracy were 52%, 90%, and 70% for reader 1 and 74%, 90%, and 82% for reader 2) and coronal T1-weighted images (respective sensitivity, specificity, and accuracy were 35%, 90%, and 61% for reader 1 and 61%, 95%, and 77% for reader 2).

CONCLUSION: Cartilage delamination is common in patients undergoing surgery for FAI. Fluid under the cartilage delamination is a specific but rare finding. Hypointense areas in the acetabular cartilage seen on intermediate-weighted fat-saturated or T1-weighted images appear to be helpful diagnostic criteria.

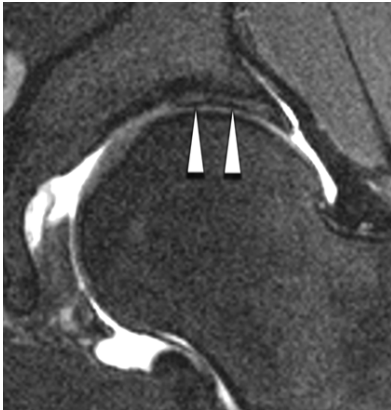


Figure 1: Coronal intermediate-weighted turbo spin-echo MR image with fat saturation (2500/42) shows surgically proved delamination of acetabular cartilage. Hypointense zone (arrowheads) corresponds to delaminated cartilage.

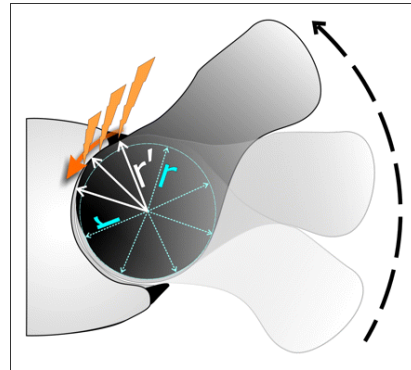


Figure 2: Diagram shows shear injury to acetabular cartilage in cam FAI. Note normal radius of femoral head (r) and aspherical portion with laterally increasing radius (r') on anterior side. Friction is caused in acetabular cartilage layer (orange arrows) each time femoral head section with increased radius enters joint in internal rotation and flexion, which leads to delamination of acetabular cartilage.

Link

(http://www.ncbi.nlm.nih.gov/pubmed/18682585?ordinalpos=3&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DefaultReportPanel.Pubmed_RVDocSum)