

## Use of Femoral Abduction External Rotation (FABER) Positioning for the Diagnosis of Acetabular Labral Tear During MR Arthrography

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### Summary

Evaluation of tear of the acetabular labrum is difficult by MR imaging. Our hypothesis is that introduction of capsular stress to the hip joint during imaging could improve diagnostic capability. This was performed through femoral abduction and external rotation (FABER) during MR arthrography. Twelve patients with suspected labral tear underwent MR arthrography in both neutral and FABER position. Quality of labral visualization was improved on the FABER images, as was detection of labral tears. MR arthrography of the hip performed in the FABER position appears to improve visualization of the acetabular labrum and associated tears.

### Introduction

Evaluation of tear of the acetabular labrum of the hip joint is difficult by MR imaging because of its small size, close apposition of the capsule, as well as its distance from the skin surface. MR arthrography has improved accuracy over non-contrast MR imaging [1], but the modality remains limited. Capsular traction has shown benefit in making subtle tears of the glenoid labrum of the shoulder more apparent; this traction is applied by placing the arm in abduction and external rotation (ABER) [2]. Our hypothesis is that introduction of capsular stress to the hip joint during imaging could improve visibility of the labrum and associated tears. This was performed through femoral abduction and external rotation (FABER) during MR arthrography.

### Materials and Methods

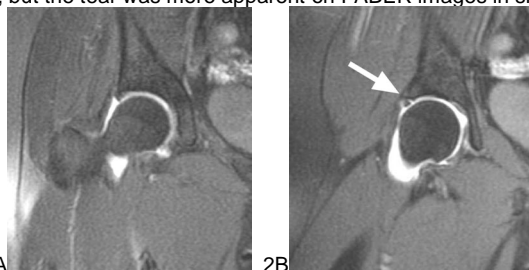
Twelve patients (M:F = 5:7, age range 19-78 years, avg 45) underwent MR arthrography for suspected labral tear. Dilute gadolinium contrast (1:200 dilution in saline) was injected into the joint using fluoroscopic needle guidance, with 1-2cc iodinated contrast used to verify intraarticular position. MR imaging of the hip was performed on a 1.5T unit (Horizon LX short bore, GE Medical Systems, Milwaukee, WI) using a Torso PA coil and FOV of 15cm. First, each patient was imaged with the leg straight, toes together (neutral position) using a coronal T1w fat suppressed spin echo sequence. Next, the affected leg was abducted and externally rotated, with the lower leg crossed underneath the contralateral leg in order to facilitate positioning in the gantry (Figure 1). In this position a repeat coronal T1w fat suppressed spin echo sequence was acquired. Images were reviewed retrospectively by three musculoskeletal radiologists in consensus for visualization of the labrum (graded 0=poor to 5=excellent). Labral tear was recorded if contrast was observed extending into or under the labrum; if a tear was seen, visibility was graded as better, equivalent, or poorer on the FABER images compared to the neutral images, using side-by-side comparison.

### Results

All patients tolerated MR examination in the FABER position. Compared to images acquired in neutral position, visualization of the labrum was better on FABER images in 8/12 (67%), and equivalent in 4/12 (33%). The average score for quality of labral visualization was 3.83 (range 3-5) for FABER images, versus 2.83 (range 1-4) for images in neutral position. Labral tear was seen in 10/12 (83%). In 3/10 the tear was seen only on FABER images (Figure 2); in 7/10 the tear was visible in both FABER and neutral positions, but the tear was more apparent on FABER images in six of these.



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Figure 1. Subject in FABER position.



2A 2B  
Figure 2. A) Neutral and B) FABER images with labral tear (arrow) on the stress image only.

### Conclusion

MR arthrography of the hip performed in the FABER position appears to improve visualization of the acetabular labrum and associated tears.

### References

- 1) Czerny C, Hofmann S, Neuhold A, Tschauer C, Engel A, Recht MP, Kramer J. Lesions of the acetabular labrum: accuracy of MR imaging and MR arthrography in detection and staging. *Radiology* 1996;200:225-230.
- 2) Cvitanic O, Tirman PF, Feller JF, Bost FW, Minter J, Carroll KW. Using abduction and external rotation of the shoulder to increase the sensitivity of MR arthrography in revealing tears of the anterior glenoid labrum. *AJR Am J Roentgenol* 1997;169:837-844.