

Femoroacetabular Impingement

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A 33 YEAR-OLD AVID MALE RUNNER presented to an orthopedic surgeon with complaints of worsening left hip pain interfering with activities of daily living and restricted motion. His examination was remarkable for a positive anterior impingement sign, reproducible pain with forced internal rotation and adduction in 90° of flexion.

Magnetic resonance arthrogram (Figure 1) of the left hip demonstrated a focal tear/detachment at the acetabulolabral junction in the anterosuperior quadrant with a focal osseous “bump” along the anterosuperior femoral neck. There was adjacent marrow edema and synovial herniation pits. No chondral injury was noted. Corresponding **computed tomography (CT)** of the left hip was performed with 3D volume rendering (Figure 2) which more clearly depicts the focal area of osseous ridging along the anterosuperior femoral neck. The patient subsequently underwent hip arthroscopy with debridement of the labral tear and femoral osteoplasty of the osseous “bump.”

DIAGNOSIS: FEMOROACETABULAR IMPINGEMENT (FAI) WITH LABRAL TEAR.

FAI and hip dysplasia comprise two opposing ends of the spectrum of hip morphologies associated with early hip osteoarthritis in young active patients. The farther one is from center (normal) the more likely one is to have symptoms. Morphology alone, however, does not directly equate to symptomatology as the prevalence of cam morphology was found to be 14% in asymptomatic volunteers.¹ The level and type of activity are equally, if not more, important to the clinical expression of disease with increasing levels of activity and those activities requiring more extremes in range of motion having higher likelihood of symptoms.

FAI is characterized by pathologic contact during hip joint motion between skeletal prominences of the acetabulum and the femur that limits the physiologic hip range of motion, typically flexion and internal rotation.² FAI is further divided into pincer type (acetabular causes), cam type (femoral causes), and mixed type

(both acetabular and femoral causes).

The typical clinical presentation in FAI is groin pain with hip rotation, in the sitting position, or both during and after sports activities in young active patients. On clinical exam, patients demonstrate restricted range of motion, particularly with flexion and internal rotation. A positive impingement sign should be present. Patients may also have a “Drehmann’s” sign if there is unavoidable passive external rotation while performing hip flexion.³

Imaging of FAI starts with radiographs that can evaluate for focal or general acetabular overcoverage as well as for osseous “bumps” or loss of concavity at the femoral head/neck junction. They can also exclude alternate pathology. Ultimately, advanced imaging such MR arthrography is typically performed to evaluate for labral tears and chondral lesions (typically anterosuperior) associated with the disorder. Although MR imaging may demonstrate the osseous bumps on the femoral neck, CT, with 3D reconstructions, is often helpful in preoperatively defining the bony anatomy.



Figure 1: Axial oblique 3D water excitation true FISP MR image of left hip with intra-articular gadolinium demonstrates focal detachment of the anterosuperior labrum (arrow) and osseous bump (arrowhead) on the anterosuperior femoral neck with associated marrow edema.



Figure 2: 3D volume rendered image from a CT of left hip demonstrates focal osseous ridge (arrow) along the anterosuperior femoral neck.

Surgical treatment of FAI focuses on alleviating femoral abutment by either femoral osteoplasty or trimming the acetabular rim. Labroplasty, chondroplasty, and focal synovectomy also play a role in specific cases. Rarely, more extensive surgery including periacetabular osteotomy may be indicated.

In conclusion, FAI is a clinical entity with an associated pattern of imaging findings which physicians should be aware of in active young patients presenting with hip pain. One must be cautious in making the diagnosis based on imaging findings alone as asymptomatic patients may have hip morphologies that fall within the FAI end of the spectrum.⁴ Long-term data is needed to determine whether early surgical intervention will ultimately delay or prevent future osteoarthritis.

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Disclosure of Financial Interests

Peter T. Evangelista, MD, is a consultant for BioMetric Therapeutics, Inc.

Holly C. Gil, MD, and/or their spouse/significant other has no financial interests to disclose.

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