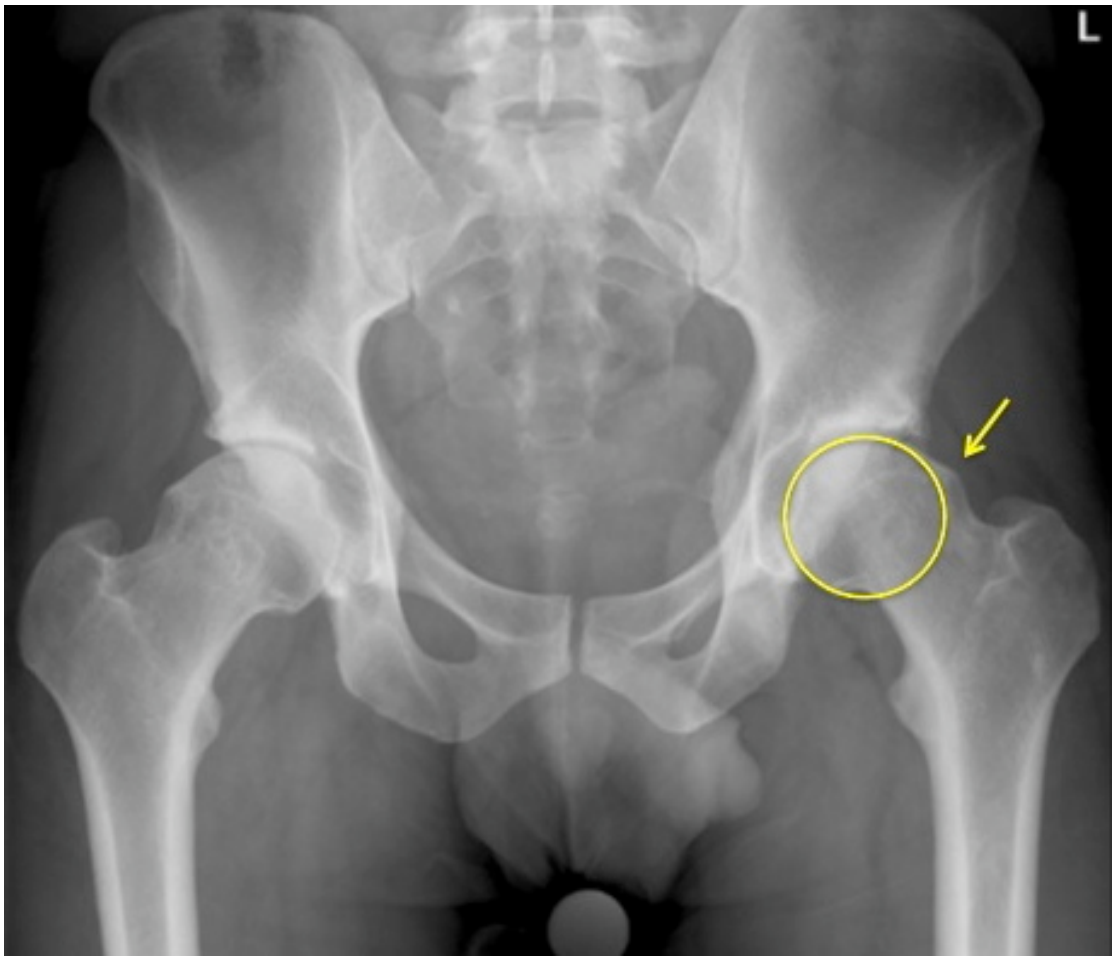
Case

This 16-year-old female, soccer athlete was treated for pain in the right groin previously. Now has acute onset of pain in the left hip. The pain was in the groin that was worse with activities.

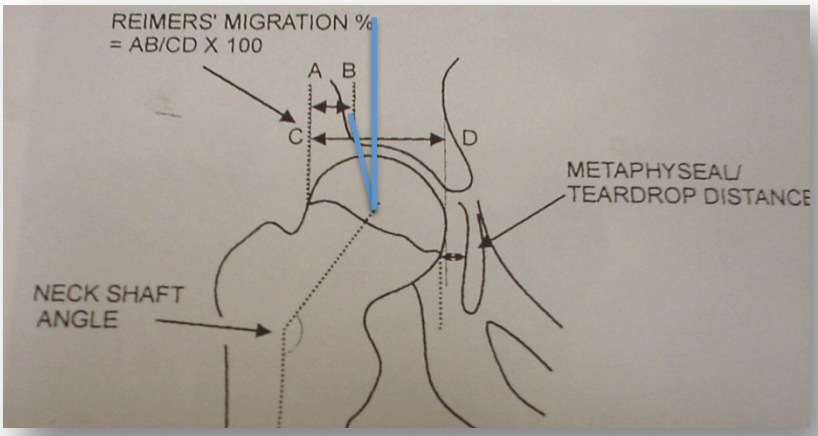


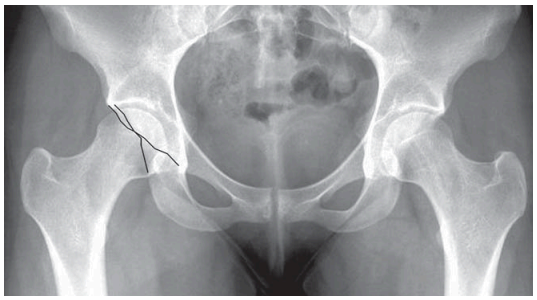
Diagnosis FAI syndrome with or without labral tear.

Other investigations required

1.X ray:

1. Anterolateral bony prominence on the femoral neck (AP or lateral radiograph)
2. Lateral subluxation
3. CE angle [in AP <20 degrees]: centre-edge angle as shown in blue lines
4. Sourcil and weight distribution Sourcil angle
5. Cross over sign and prominent ischial spine suggest retroversion of the acetabulum

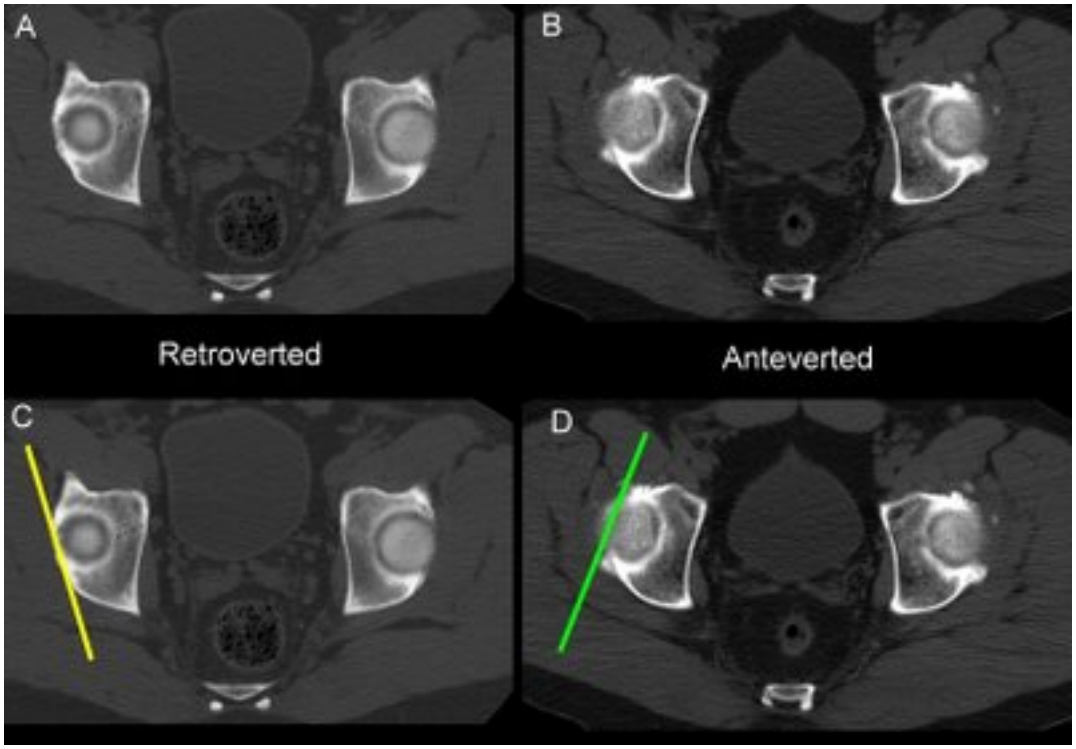




- AP radiograph

1. The crossover sign.
- 2. Prominence of ischial spine

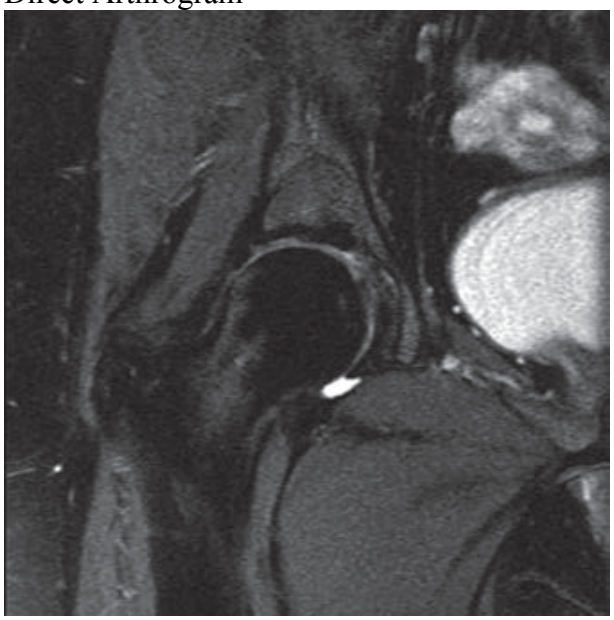
2. CT assessment for retroversion



3. MRI

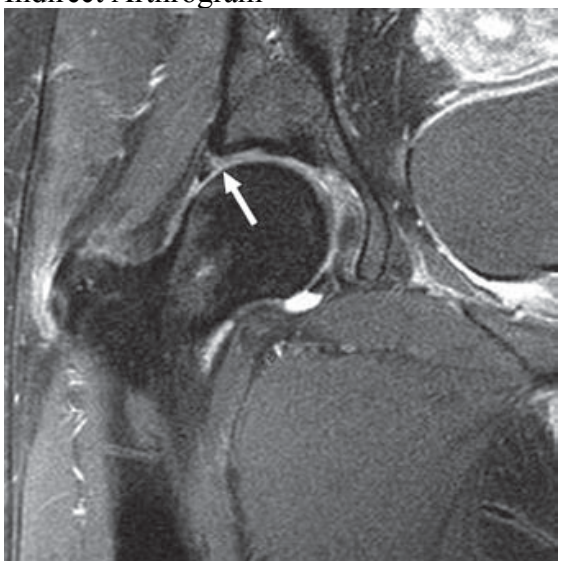
MRI: Of the 13 labral tears found at arthroscopy, 85% were detected by conventional MRI, whereas 100% were identified via indirect MR arthrography.

Direct Arthrogram



A, Coronal proton density fast spin-echo fat-suppressed unenhanced image obtained without exercise.

Indirect Arthrogram



The patient received IV gadolinium contrast medium (0.2 mL/kg) and was instructed to exercise for 15 minutes.

B, Coronal T1-weighted image with fat suppression after IV gadolinium enhancement performed after exercise and delay. The acetabular labrum tear (*arrow*) is more clearly depicted on the contrast-enhanced portion of the

IV contrast-enhanced indirect MR
arthrography appears to be an effective means of hip evaluation for labral tears. It does not appear to improve detection of cartilage abnormalities when compared with conventional MRI. [AJR:194, March 2010: 719]

However, presently noncontrast magnetic resonance imaging (MRI) has been the gold standard using 1.5-T MRI for detection of labral tear.

4. Arthroscopic Classification[Wardell]

Stage 0: contusion of the labrum with adjacent synovitis

I: Discrete labral free margin tear with intact articular cartilage

II: Labral tear with damage to the subjacent femoral head

III: II + Acetabular cartilage damage

IV: Diffuse labral and acetabular cartilage damage

SUMMARY

The acetabular labrum has various functions including enhancing joint stability, shock absorption, proprioception, joint lubrication, pressure distribution, deepening of the joint, and creating a seal.

Intra-articular abnormalities of the hip are being diagnosed with increased frequency by diagnostic methods such as conventional MRI, conventional MR arthrography, and hip arthroscopy.

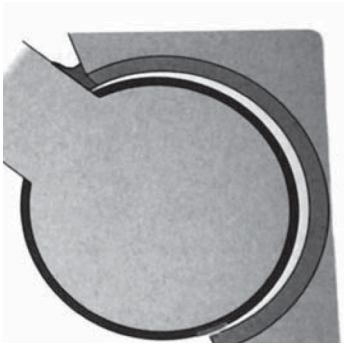
However, labral tear can be seen in asymptomatic young population. In a recent study [Am J Sports Med. 2012 Jun;40(6):1337-41]. Acetabular paralabral cysts were identified in 25% with an interobserver reliability of 90.5% and intraobserver reliability of 95%. In addition, acetabular labral tears were identified in 85%.

More recently, many of these lesions have been shown to be due to underlying femoral acetabular impingement [FAI]. Recently, FAI has been diagnosed more frequently in younger active individuals.

FAI is commonly classified as a cam-type, pincer type, or mixed cam-pincer.

Cam-type impingement occurs when the femoral head is abnormally shaped and contacts a normal acetabulum. This "bump" abuts the acetabular rim creating shearing and compressive forces that may result in tearing of the acetabular labrum and chondral injury. Males have a predilection for cam-type impingement.
Asymptomatic male subjects using MRI found a cam-type deformity in every fourth male
[Arthritis Care & Res. 2010;62 (9): 1319-1327.]

Pincer-type impingement occurs when the acetabular rim is abnormally shaped, deep, or retroverted and contacts a normally shaped femoral head. This "over-coverage" often results in labral degeneration and tearing. Pincer-type impingement is more common in females.
In 18-19 years-old, its prevalence is high in girls.
[Arthritis Care & Res. 2010;62 (9): 1319-1327.]



Studies have shown that mixed impingement can occur in 57-85% of younger individuals.
Damage to the acetabular labrum from FAI can affect overall hip function.

The presence of FAI in younger football players may be more prevalent than previously suspected. In fact, Kapron [J Bone Joint Surg AM. 2011;93:e111(1-10)] looked at the radiographic prevalence of FAI in collegiate football players (age, 21 Y) and found that 95% had a least one sign of cam or pincer impingement and 57% had signs of both (mixed). Although a labral tear may occur with a single traumatic event, often another underlying cause may be already present, predisposing the individual to injury [Clin Sports Med. 2011 Apr;30(2):293-315].

Labral tears occur most frequently in the anterior quadrant. This is due to
(1) the anterior labrum has a low vascular supply which results in poor healing;
(2) this region is mechanically weaker than other regions;
(3) the anterior labrum experience higher loads and shear forces than other regions.

How Does a Tear Occur in the Hip Labrum?
There are two general types of hip labral tears: degenerative tears and traumatic injuries.
A **degenerative tear** is a chronic injury that occurs as a result of repetitive use and activity. Degenerative labral tears can be seen in the early stages of hip arthritis.

A **traumatic hip labral tear** is usually an acute injury as a result of a sports injury, fall, or accident. Hip labral tears can be seen in association with episodes of hip dislocation or subluxation. They are commonly associated with sudden, twisting maneuvers that cause immediate pain in the hip. Isolated athletic injury or repetitive traumatic activity can lead to labral tears [Clin Sports Med. 2006 Apr; 25(2):279-92].

Classification Arthroscopy. 1996 ;12(3):269-72.
a. Etiology
Traumatic, 18.9%
Degenerative, 48.6%;
Idiopathic, 27.1%;
Congenital, 5.4%.

b. Morphology
Radial flap, 56.8%;
Radial fibrillated, 21.6%;
Longitudinal peripheral, 16.2%;
Unstable, 5.4%).

What Are the Symptoms of a Hip Labral Tear?
A hip labral tear can be difficult to diagnose.
Many of the symptoms of a hip labral tear are similar to symptoms of a groin strain, snapping hip syndrome, sports hernia, or other athletic injuries of the hip joint.

Furthermore, just because a tear is seen in the hip labrum on an MRI, it does not mean the tear is necessarily the cause of the pain.

Typical symptoms of a hip labral tear include:
- Groin pain
- Clicking and snapping sensations in the hip
- Limited motion of the hip joint

Clinical tests:
1. Provocation impingement sign

Flexion, adduction and internal rotation cause pain.

This combination brings the proximal and anterior part of the femoral neck into contact with the rim of the acetabulum

2. Hip Apprehension Test

- In the patient with classic dysplasia, pain is reproduced anteriorly as the extremity is forcefully externally rotated with hip in extension and slight abduction.
-
- In the patient with degenerative changes of the posterior acetabulum, pain is reproduced posteriorly.

McCarthy [Clin Orthop Relat Res. 2001 Dec;(393):25-37]
(1) FAI excessively loads the acetabular labrum at the extremes of joint motion,
(2) Fraying of the articular margin of acetabular labrum, tearing along the articular margin of the acetabular labrum,
(3) delamination of the cartilage from the articular margin adjacent to the labrum
(4) more global labral and articular cartilage degeneration.

Treatment
Arthroscopic surgery for FAI & labral tears has become an accepted procedure for many athletes of varied ages.

Hip arthroscopy: assessment
Traction 1cm distraction on the fracture table
Entry point: 1 Cm: anterior and posterior to the trochanter
Labral tear: isolated tear or with cartilage
Debride or reattach the labrum and cartilage

Open method [Ganz]
Capsulotomy close to the acetabulum
Dislocate the hip
Cam anterior: impinges ➔ excise
Excise any osteophytes anterior
Debride cartilage
This surgery meant to improve ROM

Post op:
There is little evidence regarding the rehabilitation of younger athletes who undergo arthroscopic hip surgery. This case study described a four phase rehabilitation program for a high school football player who underwent hip arthroscopy and labral repair. The patient achieved positive outcomes with a full return to athletic activity and football. [The International Journal of Sports Physical Therapy | Volume 7,

For younger football players, future studies should focus on risk factors for the development of FAI that may be related to position, training methods, and maturation. Future research should also focus on the outcomes of the four phase rehabilitation program for younger athletes in specific sports including: dance, hockey, and soccer.

Recent review: The American Journal of Sports Medicine, Vol. 38, No. 11

1.Femoroacetabular impingement as the cause of primary idiopathic osteoarthritis in young patients

2.Treatment for FAI succeed in improving patient symptoms? Both arthroscopic and open treatment methods for FAI significantly improved mean postoperative scores.

3. Avoid : Surgery in Outerbridge grade III or IV cartilage injury

3. Labral refixation superior to labral resection? The studies examined varied in their treatment of labral injury.

4. Does treatment for FAI affect the progression of osteoarthritis? Because all case series were relatively recent and degenerative joint disease is generally a gradual process, it was difficult to elucidate the effect of surgical correction of FAI on the progression of osteoarthritis with radiographic imaging.

In addition to a lack of high level of evidence studies, there has yet to be a direct comparison between open and arthroscopic methods.

Patients with advanced osteoarthritic change as shown on preoperative radiographs will likely benefit less from treatment of FAI.