Hip Arthroscopy: FAI and Labral tears
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Tal Lassiter, MD, MHA
Director,
Bassett Shoulder and Sports Medicine Research Institute
FAI
Femoral-acetabular Impingement

• First identified by Ganz after PAO
• Abutment of proximal femur against acetabular rim
Femoral-acetabular Impingement
FAI

• Occurs at Ant-Sup acetabulum
• IR decreased w/
  - Increased flexion
  - Increased adduction
CAM

- Aspherical head
- Pistol grip deformity
Pincer

- Acetabular retroversion- crossover sign
- Protrusio
- Coxa Profunda
- Ossified labrum
FAI

• Cam 17%
• Pincer 11%
• **Combined 72%**

• Varieties of associated pathology
  - Labrum
  - Articular cartilage
  - Premature OA

Beck, 2005
Evaluation- FAI

- Groin pain
- Difficulty with socks & shoes
- Complain of sitting in car
- Limited ROM & pain- Flex, Abd & IR
- Pain w/ squatting, pivoting
Which athletes may need hip arthroscopy?

Twisting
Symptoms

- Groin pain
- Antalgia
- Catching, locking
- Difficulty sitting with hips flexed, getting out of a car
- May masquerade as back or pelvic pain
Signs and Symptoms

- The “C” sign

Impingement Test
FADIR

FABER Test
### Physical Examination Technique Incorporating Five Different Positions

<table>
<thead>
<tr>
<th>Patient Position</th>
<th>Standing</th>
<th>Seated</th>
<th>Supine</th>
<th>Lateral</th>
<th>Prone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standing</td>
<td>General (laxity, body habitus, posture)</td>
<td>Neurologic</td>
<td>Passive range of motion</td>
<td>Paipation</td>
<td>Craig test (rotate limb until the greater trochanter is parallel to floor)</td>
</tr>
<tr>
<td>Standing</td>
<td>Gait (swing, stance, foot progression, pelvis)</td>
<td>Circulation</td>
<td>Impingement test (flexion, adduction, internal rotation (FADIR))</td>
<td></td>
<td>Ely test (flex knee and draw lower leg into thigh)</td>
</tr>
<tr>
<td>Standing</td>
<td>Spine (lateral, posterior, scoliosis, lordosis)</td>
<td>Skin</td>
<td>Thomas test (flex hips and lower affected leg)</td>
<td>Ober test (knee and hip extended, hip abducted)</td>
<td>Hyperextension</td>
</tr>
<tr>
<td>Standing</td>
<td>Pelvis (shoulder height, iliac crests)</td>
<td>Lymphatic</td>
<td>FABER test (flexion, abduction, external rotation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing</td>
<td>Trendelenburg test</td>
<td>Internal and external hip rotation</td>
<td>McCarthy hip extension sign (with both hips flexed, pain is reproduced by extending the affected hip, first in external rotation and then in internal rotation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing</td>
<td></td>
<td></td>
<td></td>
<td>FADIR test (flexion, adduction, internal rotation)</td>
<td>Paipation</td>
</tr>
<tr>
<td>Standing</td>
<td></td>
<td></td>
<td></td>
<td>Lateral rim impingement (flexion→extension in abduction)</td>
<td>Strength</td>
</tr>
</tbody>
</table>
Average Time to Diagnosis Of FAI or Hip Labral tears

22 Months!

Reason = Confused with back, pelvic and sacro-iliac problems
My Workup

• Plain XR
  ◆ AP Pelvis
  ◆ Dunn Lateral hip
• MRI Arthrogram w/ anesthetic
• 3D CT rarely
Alpha Angle

>60 abnl

Point where head loses sphericity

Head-neck center line
FAI

- Alpha angle
- CAM lesion
Cam on MRI
Conservative Rx

- Activity modification
- Reduce ROM extremes
- NSAIDs
- Strengthen hip muscles and core
- Inject hip
RX

• Restore head/neck offset
• Eliminate impingement
• Rx associated pathology
  ❑ Labrum
  ❑ Chondral
Arthroscopic Options

Labrum
• Debride
• Repair
CAM
• Osteoplasty

Pincer
• Acetabuloplasty
Chondral delamination
• Microfracture
• Chondroplasty
Traction with Fluro
Traction/Setup
Landmarks/Portals
Tools
HIP ARTHROSCOPY: What can you see?
The 23-Point Arthroscopic Examination of the Hip: Basic Setup

Carlos A. Guanche, M.D.
23 Points

Central compartment—Anterolateral portal
- 1 Cotyloid fossa, pulvinar, ligamentum teres Synovitis, tears of the ligamentum teres
- 2 Posterior medial acetabulum and labrum Chondral injury, labral tears
- 3 Anterior triangle—anterior capsule, anterior labrum, femoral head Landmark for establishment of anterior portal, labral tears
- 4 Anterior labrum, paralabral sulcus Common area for labral tears and degeneration
- 5 Lateral labrum, capsular sulcus Labral tears
- 6 Posterior capsule, zona orbicularis Labral tears, loose bodies
- 7 Femoral head Chondral injury
- Central compartment—Anterior portal
- 8 Ligamentum teres Primary position to see tears of the ligamentum teres
- 9 Posterior transverse ligament, posteromedial labrum Loose bodies, labral tears
- 10 Anterior transverse ligament, anterior labrum Loose bodies, labral tears
- 11 Superior articular cartilage Chondral injury
- 12 Lateral labrum Primary position for treatment of most labral tears, point of entry of anterolateral portal
- 13 Posterolateral capsule Posterolateral portal placed in this view
- Central compartment—Posterolateral portal
- 14 Inferior gutter Loose bodies
- 15 Weight-bearing dome of the acetabulum Chondral injury
- 16 Anterolateral labrum Labral tears
- 17 Femoral head Chondral injury

Peripheral compartment—Anterolateral portal
- 18 Medial femoral neck, orbicular ligament, medial synovial fold Synovitis, loose bodies
- 19 Medial gutter Loose bodies, synovitis
- 20 Anterior labrum Labral tears
- 21 Lateral labrum Labral tears
- 22 Lateral femoral neck, orbicular ligament Cam lesions, visualized impingement
- 23 Anterior femoral neck, anterior synovial fold Synovitis

- Morphological Classification
  - Radial Flap (21)
  - Radial Fibrillated (8)
  - Longitudinal Peripheral (6)
  - Unstable (2)
- 62% tears on anterior labrum
- No correlation of tear type and location associated with etiology
- No mention of indications, history, or PE findings
- No mention of outcomes
Labral tear
Labral Tears & Loose Bodies
Hip Pathology

Synovial Chondromatosis

Labral Tear
Chondral Damage
Hip Labrum

Intra-substance tear

Pincer
Case Presentation

- 16 yo female gymnast
- >6 months groin pain
- No acute trauma
- “Catching”
- Can’t compete
AP Hip and Lat

[Images of X-rays showing the hip and lateral projections with annotations for CEA]
Coronal MRI
Cam and Labral Tears shown
Sag and Axial Views
Labral Tear and Femoroplasty

White is normal labrum
Purple is damaged labrum
Labral Repair Steps
Cam Femoroplasty

Contouring head-neck junction

Dynamic Testing

Labrum
Cam excised
Use of Fluro
Change Rotation to Complete Femoroplasty

Scope

Burr

Rotate femur
PT/Rehab Key Points

- PWB with crutches 2-4 wks
- Early motion: avoid contracture
- Avoid inflammation
- Protect labral repair
- Core
- Hip stabilizers
- Stretch anterior hip
Results
Hip arthroscopy in athletes: 10-year follow-up.

Byrd JW, Jones KS.


METHODS: Since 1993, all patients undergoing hip arthroscopy at our institution have been prospectively assessed with a modified Harris hip score preoperatively and then postoperatively at 1, 3, 6, 12, 24, 60, and 120 months or until a subsequent procedure was performed. The variables studied included age, sex, type of sport, level of sport, diagnosis, duration of symptoms, onset of symptoms, and center edge angle. Fifty-two procedures were performed on 50 patients who had achieved 10-year follow-up. Fifteen patients developed symptoms in the course of athletic activities and their cases represent the substance of this study.

RESULTS: Follow-up information was available for all 15 patients (11 men and 4 women). The average age was 31.7 years (range, 14-70 years). Type of sport involved included football (3), tennis (3), basketball (2), golf (2), and others (5); with 9 recreational, 4 high school, and 2 intercollegiate athletes. Diagnoses included chondral damage (8), labral tear (7), arthritis (5), avascular necrosis (1), loose body (1), and synovitis (1).

The median improvement in the modified Harris hip score was 45 points (from 51 preoperatively to 96, on the 100-point scale), with 13 patients (87%) returning to their sport. All 5 athletes with arthritis eventually underwent total hip arthroplasty at an average of 6 years. There were no complications.
Arthroscopic labral repair and treatment of femoroacetabular impingement in professional hockey players.

Philippon MJ, Weiss DR, Kuppersmith DA, Briggs KK, Hay CJ.

BACKGROUND: Hip injuries are common among professional hockey players in the National Hockey League (NHL).

HYPOTHESIS: Professional hockey players will return to a high level of function and ice hockey after arthroscopic labral repair and treatment of femoroacetabular impingement.

METHODS: Twenty-eight professional hockey players (NHL) were unable to perform at the professional level due to unremitting and debilitating hip pain. Players underwent arthroscopic labral repair and were treated for femoroacetabular impingement from March 2005 to December 2007. Players who had bilateral hip symptoms were excluded. Athletes completed the Modified Harris Hip Score preoperatively and postoperatively and also completed a patient satisfaction questionnaire postoperatively. Return to sport was defined as the player resuming skating for training or participation in the sport of ice hockey.

RESULTS: The average age at the time of surgery was 27 years (range, 18-37). There were 11 left hips and 17 right hips. Player positions included 9 defensemen, 12 offensive players, and 7 goaltenders. All players had labral lesions that required repair. In addition, all patients had evidence of femoroacetabular impingement at the time of surgery. The average time to return to skating/hockey drills was 3.4 months. The average time to follow-up was 24 months (range, 12-42). The Modified Harris Hip Score improved from 70 (range, 57-100) preoperatively to an average of 95 (range, 74-100) at follow-up. The median patient satisfaction was 10 (range, 5-10). Two players had reinjury and required additional hip arthroscopy.
The outcome of hip arthroscopy in Australian football league players: a review of 27 hips.

Singh PJ, O'Donnell JM.

PURPOSE: The purpose of this study was to investigate on hip pathology found at hip arthroscopy in Australian Football League (AFL) players and describe our current treatments and outcomes.

METHODS: From 2003 to 2008, 24 consecutive AFL players (27 hips) had arthroscopic hip surgery by use of the lateral position. Patients were assessed preoperatively and postoperatively with the modified Harris Hip Score (MHHS) and Nonarthritic Hip Score (NAHS) and postoperatively with a satisfaction survey.

RESULTS: All hips were available for review. The mean duration of follow up was 22 months (range, 6 to 60 months). The mean age was 22 years (range, 16 to 29 years). The mean body mass index was 24 points (range, 21 to 26 points). The mean traction time was 21 minutes (range, 11 to 60 minutes). The most common pathology was a rim lesion, affecting 93% of cases. Microfracture was performed in 22%. Synovitis was found in 70%, and this was most commonly associated with a rim lesion. Labral pathology was present in 33%, the most common of which was labral separation. On the femoral side, 81% had cam impingement and underwent a femoral neck ostectomy. Rim lesions and labral pathology were the most commonly associated lesions. Also seen were loose os acetabuli in 7% and loose bodies in 7%. The former were associated with labral tears and required repair. The MHHS and NAHS improved in all patients postoperatively, and they maintained their improvement from 1 year up to 4 years. In all but 1 case, the players returned to playing at the AFL level and were satisfied with their outcome.
Complications

• Traction injuries
  – Transient neuropraxia to pudendal and sciatic nerves
  – Pressure necrosis to foot, scrotum, or perineum

• Direct neurovascular injury

• Iatrogenic chondral injury

• Iatrogenic labral injury

• Instrument breakage

• Myositis
Remaining Questions

• Do we need to repair the labrum?
  “Probably”

• Can we delay hip OA?
  “Unknown”
Key Points

- Diagnosis (3)
- Radiology- AP pelvis & lateral
- MRA of the one hip with anesthetic
- Cam
- Pincer
- Labral tears
The End

That’s all Folks!