HIP IMPINGEMENT IN THE ATHLETE: THE COMPLEX MADE SIMPLE

J. Kristopher Ware MD, DPT
Orthopedic Associates of Hartford
Bone and Joint Institute/Hartford Hospital

DISCLOSURES

- I have no financial interest or contractual relationships with any commercial interest relating to this presentation.
- The views expressed in these slides and today’s discussion are my own.

OBJECTIVES

- Understand the different types of femoroacetabular impingement and how to distinguish between them.
- Understand the important history and physical examination findings with hip impingement.
- Describe the imaging studies used to diagnose hip labral tear and impingement.
- Differentiate when conservative versus surgical management is warranted, and the outcomes associated with each method.
FEMOROACETABULAR IMPINGEMENT

- Structural mismatch of proximal femur and acetabulum
- Results in abnormal loading of hip joint leading to damage of articular cartilage and labrum
- May lead to early joint degeneration and osteoarthritis

FEMOROACETABULAR IMPINGEMENT

- Cam impingement (45%)
- Pincer type (<10%)
- Combined (45%)
- Extra-articular impingement
- Subspine impingement
- Ischiofemoral impingement

ETIOLOGY

- Can occur secondary to pediatric hip conditions resulting in structural deformity
  - SCFE, Perthes disease
- Most cases present with no prior history of disease
- Likely combination of genetic and environmental influences on hip development
ETIOLOGY

- Males: 3-5x risk of cam lesion
  - RR of 2.8 for siblings with cam
  - Genetic influence
  - Increased prevalence in football, soccer, and hockey players
- Environmental
  - NFL combine: 90% showed radiographic evidence of FAI
    - 31% symptomatic
    - Larger cam deformity associated with increased chance of being symptomatic

CAM IMPINGEMENT

- Shear forces at chondrolabral junction leading to separation of labrum from acetabular rim
- Chondral damage that often extends deep into acetabulum
  - Begins as softening → debonding → delamination
- Anterosuperior cartilage loss over the femoral head

PINCER IMPINGEMENT

- Overcoverage
  - Global: coxa profunda/ protrusio
  - Focal: cephalad retroversion of acetabulum
- Degenerative tearing of anterosuperior labrum
- Calcification/ ossification of labrum may occur
- Posteroinferior contrecoup injury to posterior femoral head and posterior inferior acetabulum
PRESENTATION

- Often insidious onset
- Anterior groin pain is typical but may also present with low back, lateral hip, or knee pain
- Deep hip pain - “C” sign
- Worse with flexion and internal rotation
- Often aggravated by running, pivoting, and sitting with hip flexed
- Pincer patients tend to be older than cam patients
  - cam = young male in 20s
  - pincer = middle-aged female in 40s

PHYSICAL EXAMINATION

- Comprehensive examination including lumbar spine, SI joint, hip muscles
- Mild intermittent limp in 75%, may be subtle
- Occasionally Positive Trendelenberg sign
- Posture - look for hyperlordosis
- ROM: <100 deg straight flexion
  - <10 deg lift at 90 deg
- Dynamic examination
  - Single and double leg squat

PHYSICAL EXAMINATION

- Anterior impingement test (FADIR)
- Posterior impingement test (ischiofemoral impingement)
- Stinchfield test
- FABER
- Diagnostic anesthetic injection
RADIOGRAPHS

- Standing AP pelvic:
  - Joint space, acetabular depth, cross over sign, LCFA (nl 20-40), Tonnis angle (0-10)
  - True acetabular retroversion: cross over sign, ischial spine sign, and posterior wall sign

- False profile:
  - ACEA (nl 20-40)
  - AIS (subspin impingement)
  - Frog lateral or Dunn views
  - Cam deformity
  - Alpha angle (nl <50 degrees)

MRA

- MR arthrogram:
  - Labral tears
  - Chondral damage
  - α Angle
CT SCAN

- Can be helpful in select cases for determining appropriate resection of cam and pincer lesions.

TREATMENT

- Activity modification, NSAIDs
- Physical Therapy/Training room
- Hip injection (diagnostic & therapeutic)
- Surgery
  - Labral repair/reconstruction
  - Femoral/acetabular osteoplasty

PHYSICAL THERAPY/TRAINING ROOM

- Address pelvic tilt
- Core/hip stabilization
- Address flexibility (hip flexors, hamstrings, rectus femoris, ITB)
- Normalize walking and running gait
- Sports specific progression
- Dry needling
Pennock et al. AJSM 2018

- Prospective study of 93 hips in 76 patients with clinical and radiographic evidence of femoroacetabular impingement (78% with labral tears)
- 43 hips (46%) treated with PT alone
- 11 hips (12%) PT + injection
- 17 hips (18%) required surgery
- Similar outcomes in all 3 groups
- Cam or combined type 4.4x as likely to require surgery compared to pincer type

Hip Injection

Non Operative Outcomes

Surgery

Arthroscopic versus open
Labral repair/ reconstruction
Femoral neck osteoplasty
Acetabular osteoplasty
SURGICAL OUTCOMES

Byrd AJSM 2011
- 116 athletes with 2 year follow up
  - mHHS: preop 72, post op 96
  - 95% of professional athletes and 85% of intercollegiate athletes returned to prior level of competition

Chen et al. Arthroscopy 2019
- 31 basketball players followed for average of 4 years
  - 78% showed significant improvement on PROs
  - 84% returned to play (74% at same level or above)

Surgical Outcomes

Minkara et al. AJSM 2019
- Systematic review and meta-analysis
- 1981 hips included with average age of 29.9 yo
- Improved patient reported outcomes measures in all studies
- 87.7% returned to sports

TAKE HOME

- Think from the outside in
- The labrum is the victim not the cause in femoroacetabular impingement
- X-rays are the most important imaging tool for diagnosing femoroacetabular impingement
- MRA is primarily for surgical planning
- Non surgical treatment can be effective in many patients
- When surgery is needed outcomes are generally favorable in athletes without articular cartilage damage
REFERENCES


THANK YOU!