Conservative Management of FAI & Hip Labral Tears

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Outline

• Brief history
• Define FAI and subtypes
  – Cause of LT
• Etiology
• Screening techniques
• Non-invasive treatment ideas
  – Manual and therapeutic exercise strategies

Hips Don’t Lie

History

• 1960s Murray suggested a deformity of proximal femur as cause of hip OA
  – Minor developmental deformity
  – Perhaps a mild untreated SCFE
• 1970s and ’80s Harris, Soloman et al expanded on this theory
  – Additional data
  – “Pistol grip” deformity

Joint Preservation and Function

— Depends on three biomechanical factors

1. Good femoral head-neck offset
   — For proper ROM of femoral head w/in acetabulum
2. Proper acetabular anteversion
   — Decreased anteversion increases external rotation
3. Correct acetabular coverage of the femoral head
   — Amount of femoral head coverage
Normal Bony Alignment

- Acetabular face –
  - 35-45 deg caudally,
  - 15-20 deg anterior (anteverted)
  - Figure C next slide

- Depth – 170 deg coverage of femoral head

- Femoral Neck-shaft angle
  - 125-135 degrees

Normal Bony Alignment

- Femoral anteversion
  - Gradual decrease throughout childhood
  - 10-15 degrees in adulthood
  - With respect to the femoral condyles
    - ↑ = toe in
    - ↓ = toe out

- Acetabular anteversion
  - ~ 20 degrees

Hip Labrum

- Fibrocartilage
- Deepens already stable FA joint
- Helps contain femoral head in extreme ROMs
- Flexion mostly
- Maintains vacuum seal of joint space
- ↑ Joint congruity

Articular Cartilage

- Articular hyaline cartilage
- Collagen, chondroitin sulfate...
- No innervation, avascular
- SHOCK ABSORPTION
- GLIDING of joint surfaces

What is Femoroacetabular Impingement?

- Simple!
  - Subtle deformity of the bony structure of the FA joint
- 3 types
  1. CAM
  2. Pincer
  3. Mixed CAM/Pincer

Cam Impingement

- CAM = Abnormally shaped femoral head
  - More common in males
  - Symptoms reproduced w/ flexion/IR
  - Bump at femoral head/neck junction
    - Causes shearing of labrum off of acetabular rim
    - Damages cartilage underneath, then...

Why??
  Abnormal extension of epiphyseal scar
  - More about that later...
Cam lesion – 3D CT

CAM - Alpha Angle

Pincer Impingement
- More common in females
- Two types of Pincer
  - Acetabular overcoverage
    - Coxa profunda
  - Acetabular retroversion
    - Functionally, over coverage of the anterior/superior femoral head
- "crushes" femoral head/neck into acetabular rim, destroying labrum...then cartilage...then....

Cam v. Pincer – type of tear

Who has FAI?
Progression of Hip Labral Pathology

- Excessive loading of the labrum (FAI)
- Global labral and articular cartilage degeneration
- Fraying of the anterior labrum
- Delamination of the articular cartilage
- Tearing of the anterior labrum

Etiology?
- Inconclusive body of evidence
- Congenital?
  - Sure, lets just blame genetics
- Subacute SCFE?
  - Mild slip over time untreated
- Growth of CAM over time?
  - Deep flex/abduction/impingement causes and remodels osteophyte
  - Enlargement head/neck junction due to loading during adolescence.

CAM lesion growth?

- Siebenrock et al., 2004

“Flying Buttress”

FAI in College FB players

Kapron et al JBJS 2011

Radiologic Prevalence of FAI in College FB
- 67 players, avg. age 21
  - Measured alpha angle, femoral head-neck offset, lateral center-edge angle, acetabular index, crossover.
- 95% of 134 hips had at least one sign of cam or pincer impingement, 77% > 1 sign
- Hip morphologic changes common in highly trained powerful athletes.

CAM FAI in Adolescents

- Philippon et al (2013 AJSM)
  - 61 youth IH and 27 male youth skiers (ages 10-18)
  - Clinical hip exam and MRI alpha angle compared
  - Clinical exam findings did NOT differ b/w groups
  - but IH group had higher α than skiers
  - AND, Alpha angles increased with age
Is this as bilateral problem?

- Klingenstein et al. 2013 AJSM
- Reported 514 bilateral and 132 unilateral FAI patients.
  - Bilateral pts:
    - Higher alpha angles
    - Sig. lower acetabular anteversion
  - Younger pts had higher alpha angles, less acetabular anteversion, and more likely for bilateral FAI treatment (surgery).

Asymptomatic imaging

- Silvis et al. 2011 AJSM
  - 21 pro & 18 male college hockey players
    - Asymptomatic w/o hx pelvis/hip injury
  - 77% (30/39) demonstrated hip or groin abnormalities on 3T MRI
    - 64% hip pathology
    - 56% labral tear
    - 36% "common adductor/abdominal rectus dysfunction"

MRI must be adjunct to clinical evaluation of hip/groin pain

Relationship w/ Athletic Pubalgia

- Economopoulos et al. (2014 Sports Health)
  - Retrospective review 43 pts w/ 56 athletic pubalgia repairs
    - 42 male, 1 female; 22.3 y/o; mostly college/HS athletes
    - AP and frog leg lateral films evaluated
  - FAI identified in 86% pts
  - CAM lesions found in 83.7%
  - Pincer lesions in 28% of hips

Prevention Strategies

- Prevent FAI???
  - Are kids pushed too hard, or specializing too early?

- Can we identify those at risk?

- Can we slow progression of pathology?

So what do we do??

FAI/LT treatment

non-surgical

- Manual therapy
  - Joint mobilizations
  - A.R.T./IASTM, etc
- Injections
  - Tx and dx in nature
- Postural control
- Neuromuscular re-ed
- Restore “joint centration”

surgical

- Arthroscopy
  - Labral repair
  - Capsular plication
  - Chondroplasty/osteoplasty
  - Rim trimming
  - Microfr
- RTP ~ 4-6 months
Physical Evaluation

- Regardless of your evaluation techniques
  - Physical exam, SFMA/FMS...
- Your likely going to find some variation of the following:
  - Movement impairment
    - Poor motor patterns (squat)
    - Tight capsule - flexion, extension, internal rotation
    - Tight/inhibited gluteals and deep external rotators
    - Tight hip flexor complex
      - TFL, ilioptosis, adductors
    - Increased lumbar lordosis
      - w/ limited thoracic extension/rotation

Conservative Management Strategies:
What is our goal?

- Thoracic mobility
- Hip capsule or anterior ms tightness
- Glute weakness/postural control
- Poor technique/postural awareness
- FAI &/or LT = Irreducible Dysfunction

No Dysfunction

Screening Athletes

FMS Overhead Squat

- IR norm – 25-40 deg. →
- ER norm – 50-75 deg.
  - Or FABER

PROM – hip flexion

- Clinician monitors lordosis
  - Norm ~ 125°
- Decreased ROM:
  - Anterior block
    - FAI - irreducible
  - Posterior tightness
    - Glutes, piriformis posterior capsule

Joint Mobilization

Inferior
Joint Mobilization

Anterior

Lateral Mob - manual

Tight posterior capsule/musculature

Posterior capsule ART

Iliopsoas tightness/adhesions

f/u hip flexor stretch

- Also, standing IR v. supine 90-90
- Iliopsoas
  - lean
  - Hands up
- RF
  - Tilt
- Adductors/abductors
  - Move med-lat

Squat Patterning
Glute Strengthening

Band walk series

1/3 SLDL rotations

T-spine mobility

↑ lumbar lordosis = ↑ anterior pelvic tilt
= ↑ hip flexion

Pelvic positioning

Front squat v. back

Taping option

• Perhaps K-tape or similar

• Proprioceptive input

Gelber & Dames, NATA News Feb. 2010
So, when is surgery?

• Generally 3-6 months of conservative care before surgery
  — Insurance driven; not evidence based

• Timing of surgery
  — Life events, season, etc.

Thank You!!

References

• References at end of talk #2.