

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



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



History

- 2003 Ganz et al. coined “Femoracetabular Impingement”
 - Defined how these subtle deformities can cause OA
 - Introduced idea that correction of the deformity could reduce or slow development of OA
- Access was an issue
 - Open surgical dislocation best option
- Mid 2000's – Byrd, Kelly, Philippon....etc.
 - Developed arthroscopic techniques



Joint Preservation and Function

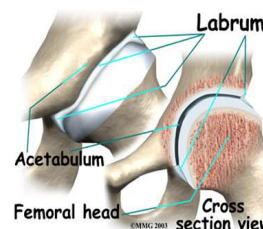
– Depends on three biomechanical factors

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



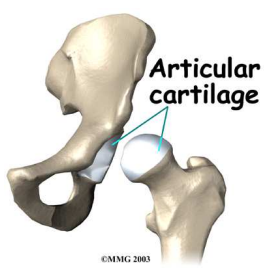
Hip Labrum

- 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

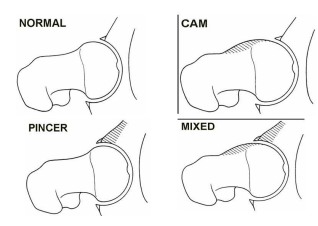


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What is Femoroacetabular Impingement?

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



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Cam Impingement

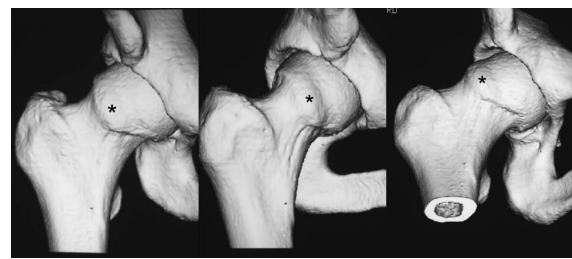
- CAM = Abnormally shaped femoral head
 - More common in males
 - Symptoms reproduced w/ flexion/IR
- Bump at femoral head/neck junction
 - Causes shearing of labrum off of acetabular rim
 -damages cartilage underneath, then..

Why??

Abnormal extension of epiphyseal scar
-more about that later...

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Cam lesion – 3D CT



Byrd 2010 – Sports Health

CAM - Alpha Angle

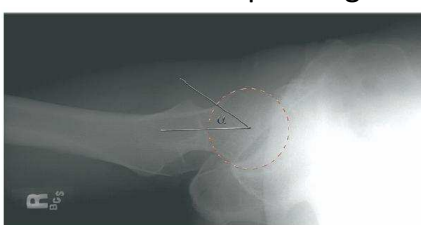


FIGURE 1. The alpha angle is measured by defining the center of the head with a circular template and then drawing the circumference of a circle. One line is drawn from the point at which bone deviates from the circle toward the center of the head; the second is drawn from the center of the isthmus of the femoral neck to the center of the head.

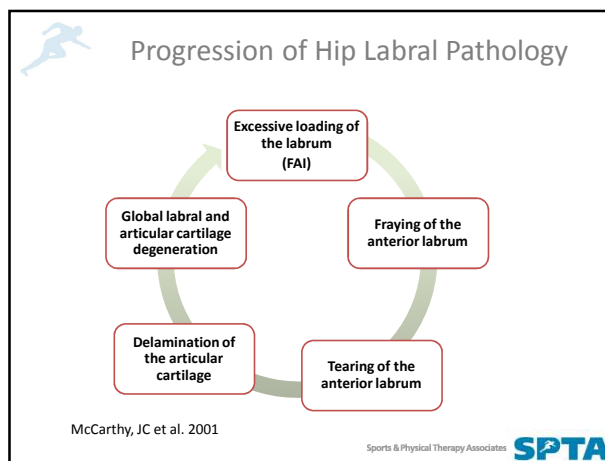
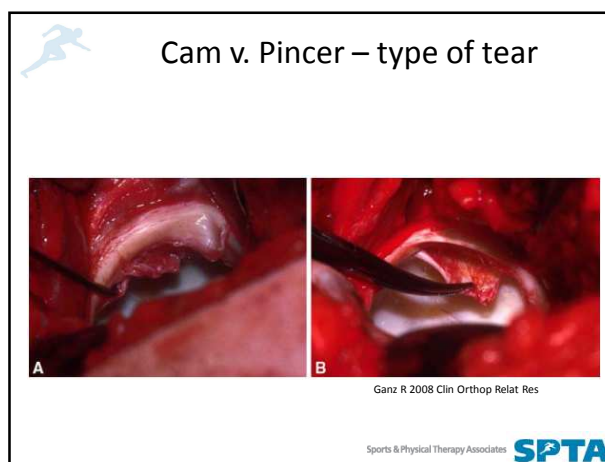
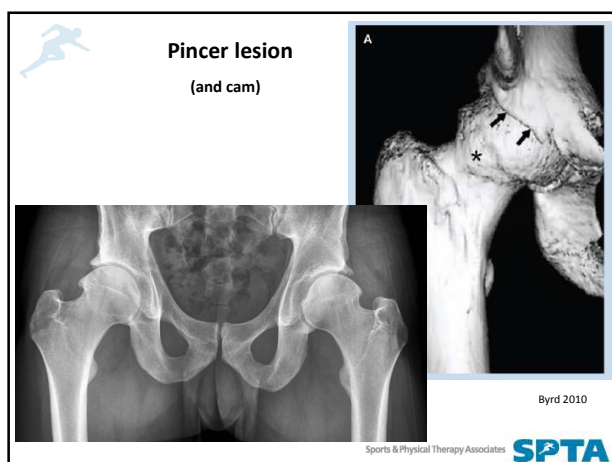
Johnston, TL et al 2008

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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....

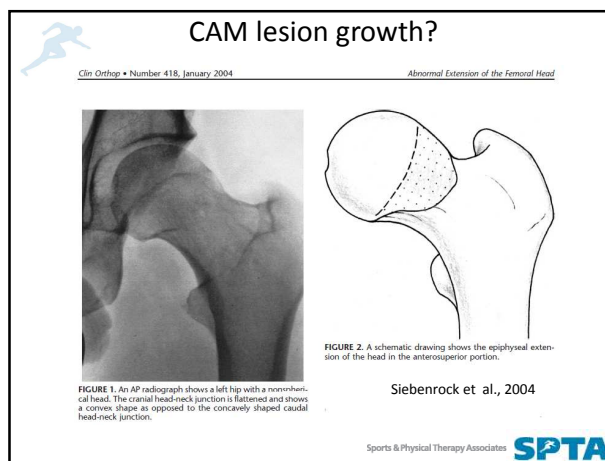
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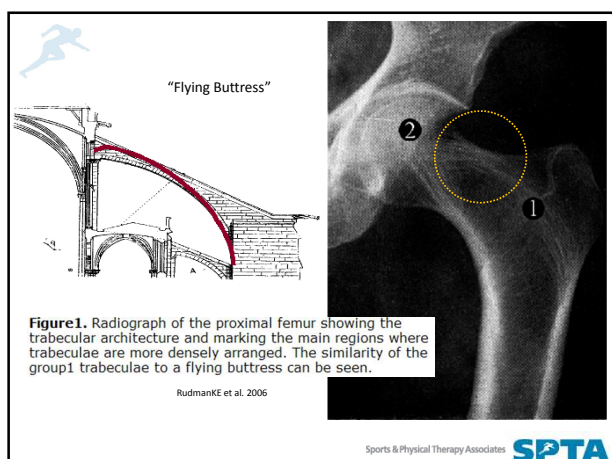


Etiology?

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

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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.

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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**

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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).

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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

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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

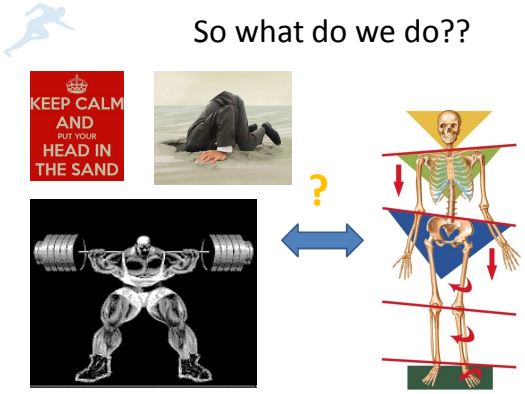
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Prevention Strategies

- Prevent FAI???
 - Are kids pushed too hard, or **specializing too early?**
- Can we identify those at risk?
- Can we slow progression of pathology?

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So what do we do??



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FAI/LT treatment

non- surgical	surgical
<ul style="list-style-type: none"> • Manual therapy <ul style="list-style-type: none"> – Joint mobilizations – A.R.T./IASTM, etc • Injections <ul style="list-style-type: none"> – Tx and dx in nature • Postural control • Neuromuscular re-ed • Restore “joint centration” 	<ul style="list-style-type: none"> • Arthroscopy <ul style="list-style-type: none"> – Labral repair – Capsular plication – Chondroplasty/osteoplasty – Rim trimming – Microfx • RTP ~ 4-6 months

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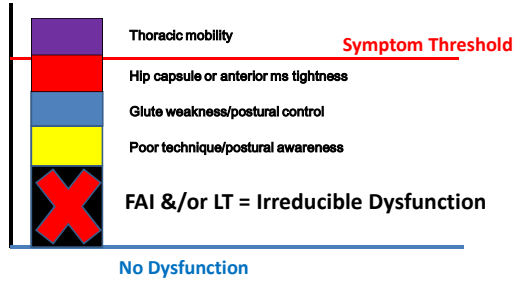
Physical Evaluation

- 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, iliopsoas, adductors
 - Increased lumbar lordosis
 - w/ limited thoracic extension/rotation

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Conservative Management Strategies:

What is our goal?




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Screening Athletes

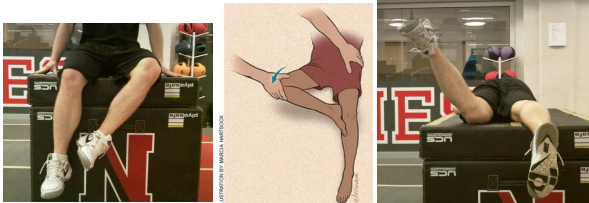


FMS Overhead Squat


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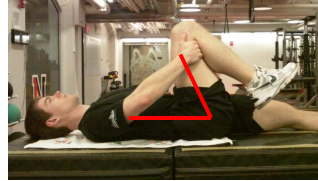
- IR norm – 25-40 deg. →
- ER norm – 50-75 deg.
– Or FABER



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PROM – hip flexion

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



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Joint Mobilization
Inferior





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Joint Mobilization
Anterior





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Lateral MWM – w/ belt



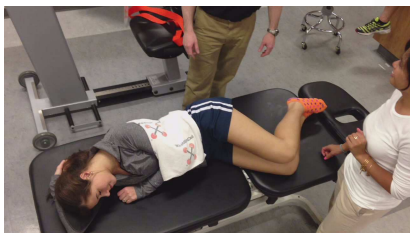
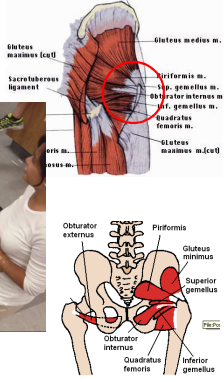
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Lateral Mob - manual



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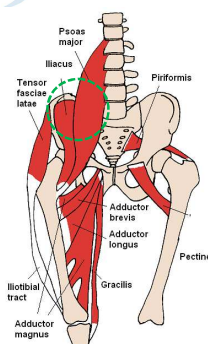
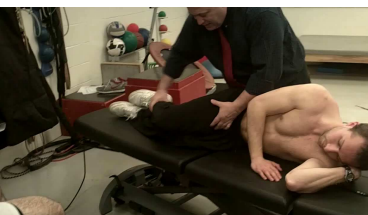
Tight posterior capsule/musculature

Posterior capsule ART

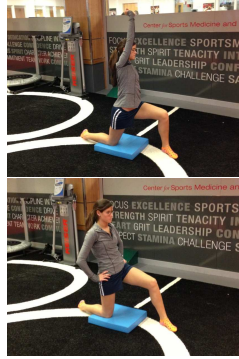
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Iliopsoas tightness/adhesions

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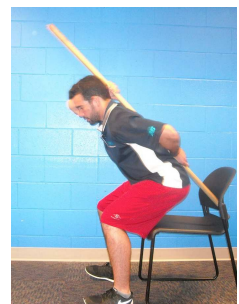
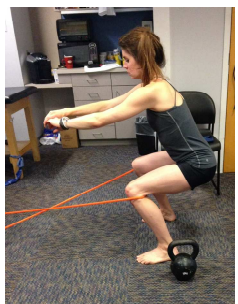
f/u hip flexor stretch



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

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Squat Patterning

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Glute Strengthening




FIGURE 3. Single-limb squat exercise.
DiStefano et al. 2009 JCSPT



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Glute Strengthening

Band walk series

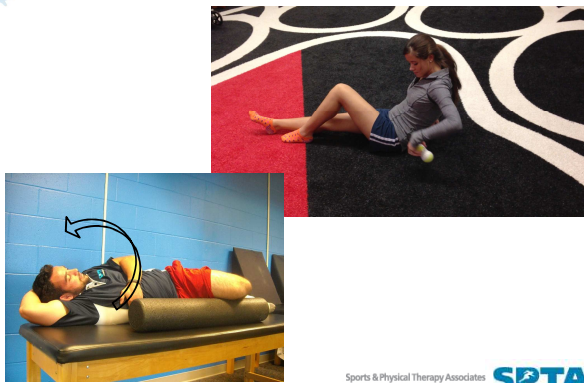


1/3 SLDL rotations



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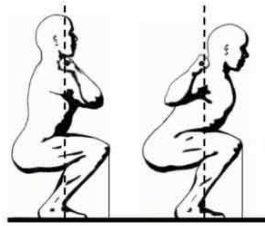
T-spine mobility



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Pelvic positioning

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



Front squat v. back


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Taping option

- Perhaps K-tape or similar
- Proprioceptive input



Gelber & Dames, NATA News Feb. 2010

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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.

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Thank You !!



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