Orthopedics: Evaluation, Diagnosis, Pathology and Radiology for Hip, Back and Gluteus Medius Pain

Sarah M. Higginbotham, APRN, MSN, FNP-C

Objectives

- Perform proper history, physical exam and work-up of patients with hip vs back pain
- Identify hip pain as intra-articular or extra-articular
- Understand radiograph findings and when to order advanced imaging
- When should my patient see a hip specialist?

About Me

- Tulsa, OK native, live in Edmond, OK
- Higginbotham Family – me, Stephen, Alex and Evie
- OSU
- Thunder up!
- Enjoy family time, reading, being outside, traveling and talking about hips ;)

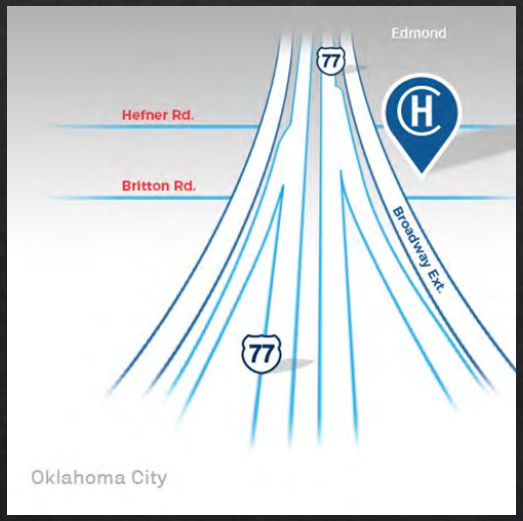
Education

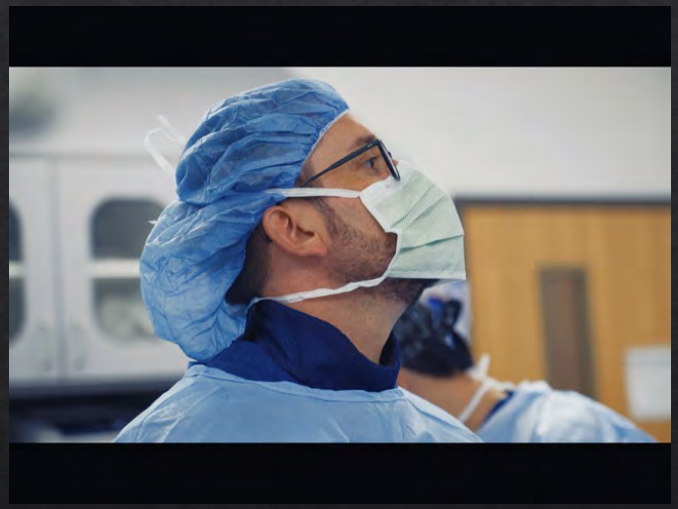
Oklahoma State University
B.S. Nutritional Sciences –
Allied Health

University of Oklahoma
B.S. Nursing

University of South Alabama
MSN – Family Nurse Practitioner

Current Practice

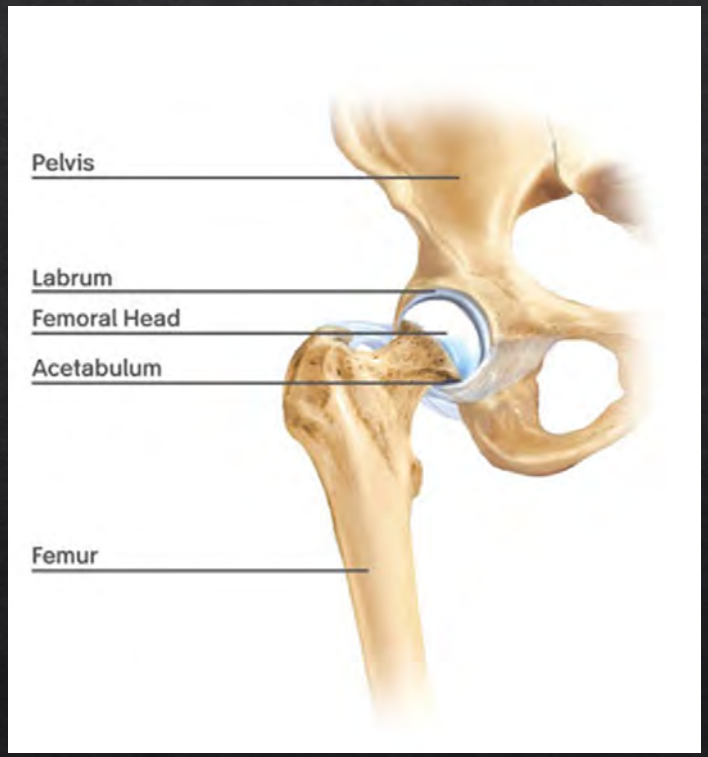




- Hip Arthroscopy
- Labral Repair
- Hip Impingement
- Labral Reconstruction
- Trochanteric Bursitis
- Gluteus Medius Tears
- Hamstring Tears

THE HIPCLINIC
M. BRANDON JOHNSON, M.D.

Hip Anatomy



- Ball and socket joint
- Femoral Head & Acetabulum
- Labrum – cartilaginous ring
- Largest weight bearing joint in the body

Hip vs Back

HIP

- Anterior, Groin Pain
- +C-Sign
- Dull, Achy, Pinch
- Worse with hip flexion and weight bearing activity
- Standing AP and frog leg lateral

BACK

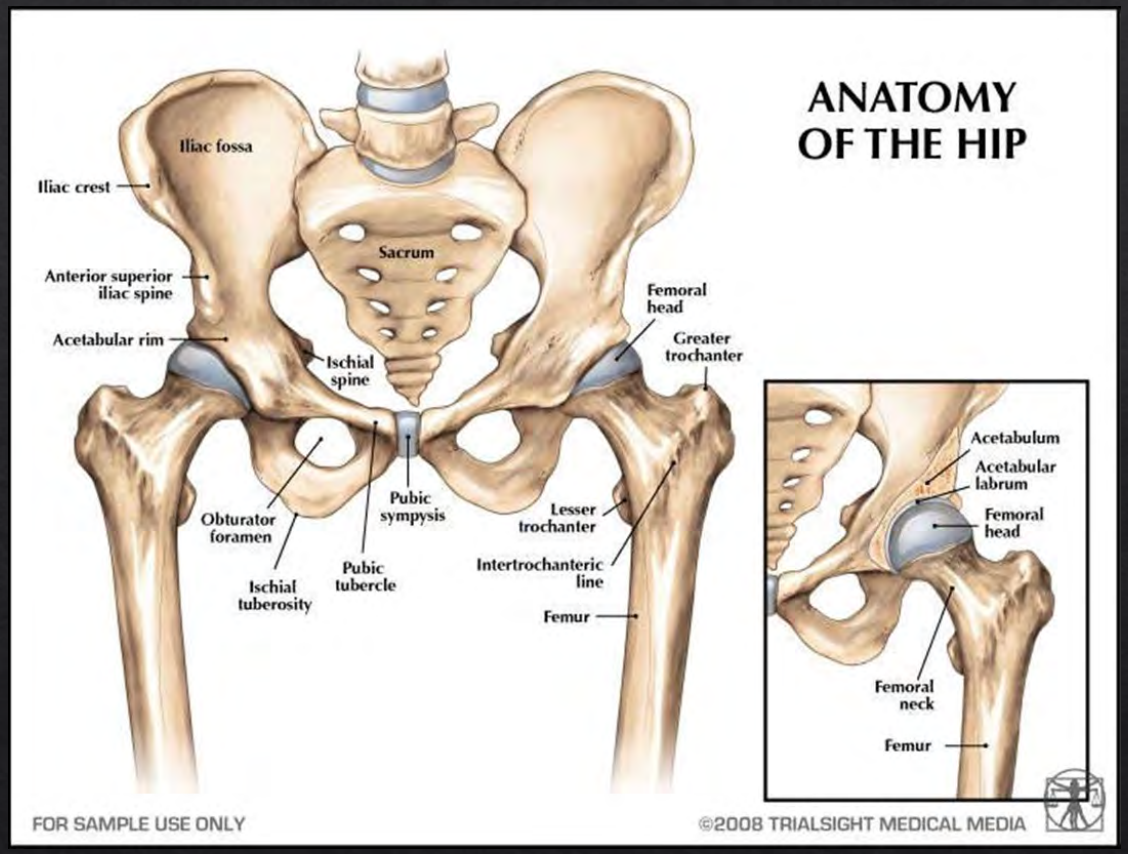
- Posterior, deep buttock
- Radiates
- Above “BELT LINE”
- Shooting nerve pain
- Worse with sitting/bending, improves with walking
- 4 view radiographs L-spine

Hip: History / Physical Exam

- Location – anterior, lateral, posterior, SI joint
- Hip flexion or weight bearing activity?
- Mechanical complaints
- Injury or iatrogenic
- Age
- Physical Exam – have the patient point to where they hurt*. +Fadir, +Faber, peri-troch tenderness, + stinchfield. +abduction. iliac crest. patellofemoral pain

Hip: Differential Diagnosis

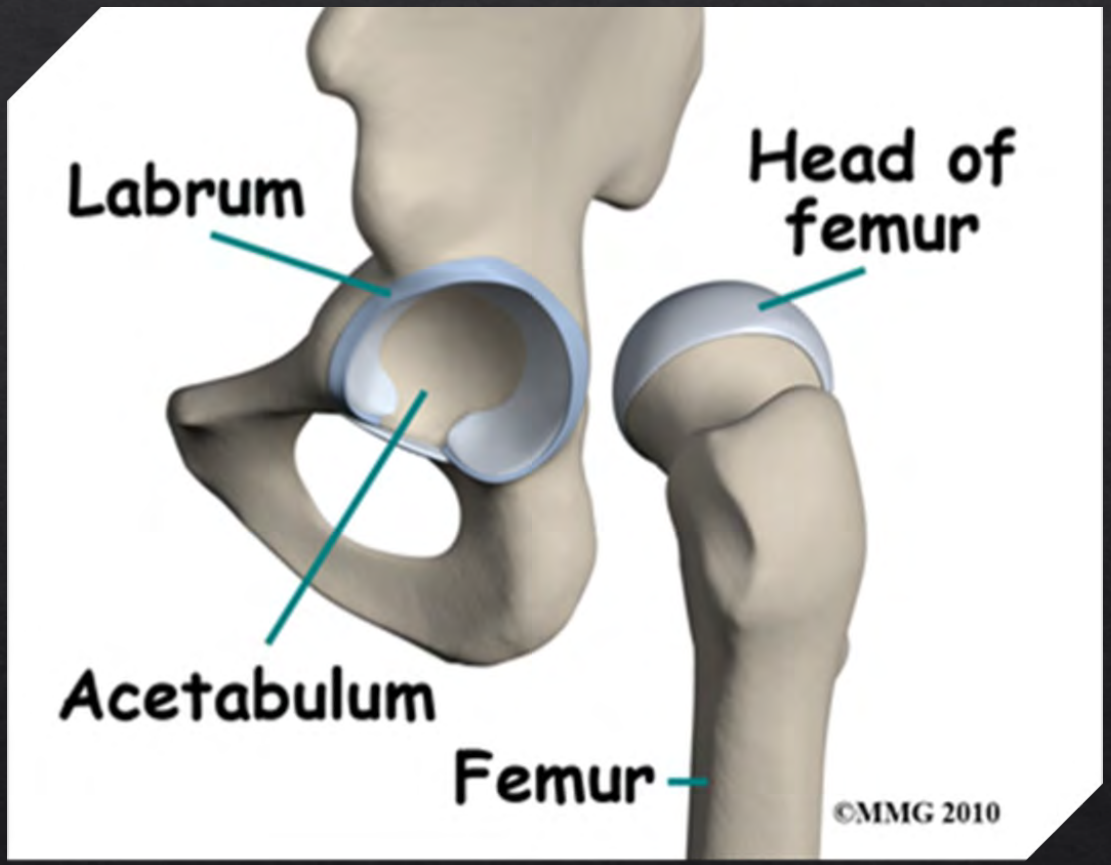
- Iliopsoas strain
- Labral tears
- Hip impingement
- Hip dysplasia
- Greater Trochanteric bursitis
- Gluteus Medius tears
- Osteoarthritis
- Ischial bursitis
- Hamstring strain
- Adductor strain
- Pelvic avulsion injury
- Snapping hip (internal, external)
- Sacroilitis
- Fracture



The Labrum

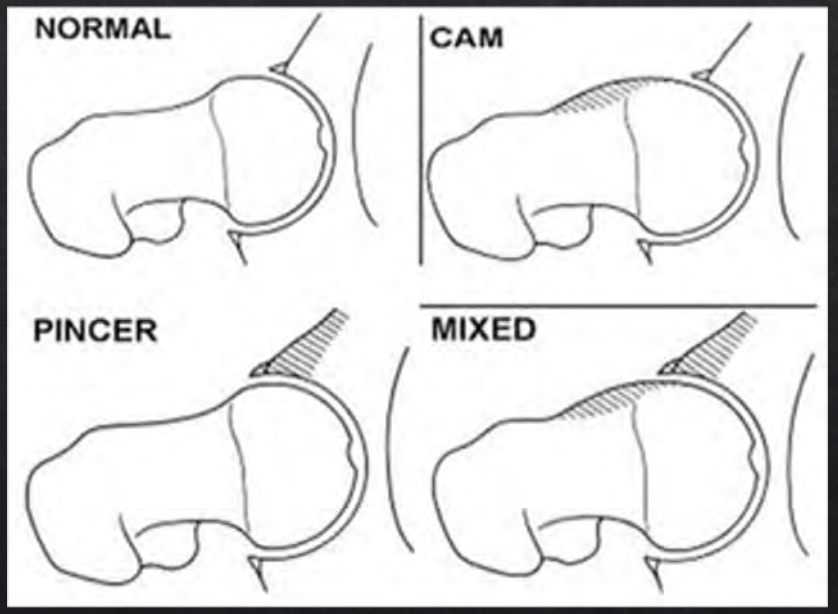
- The **labrum** is a rim of soft tissue that surrounds the **hip** socket. The **labrum** adds to the stability of the **hip** by deepening the socket. [5]

- The **labrum** can tear as the result of an injury or impingement.



Hip Impingement

- Hip impingement or **Femoroacetabular impingement (FAI)** is a condition where the bones of the hip are abnormally shaped.
- Because they do not fit together perfectly, the hip bones **pinch** against each other, tearing the labrum and cause damage to the joint.
- Patients 13+, skeletally mature .



Causes of Labral Tearing

ACUTE

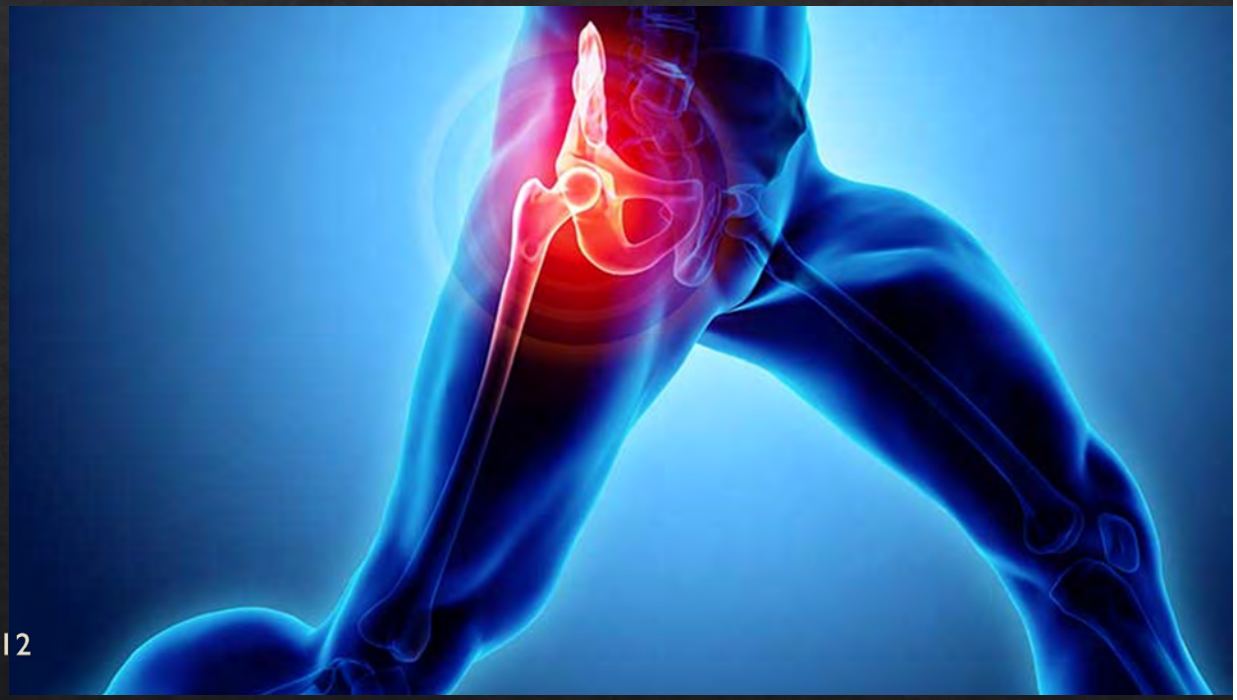
- Falls
- Motor vehicle accident
- Hyper flexion injury
- Hip pointer-blow to lateral hip

CHRONIC

- Repetitive hip flexion
- Running, walking, using stairs
- Sitting
- Getting in and out of car
- *MOST COMMON

Labral Tear Complaints*

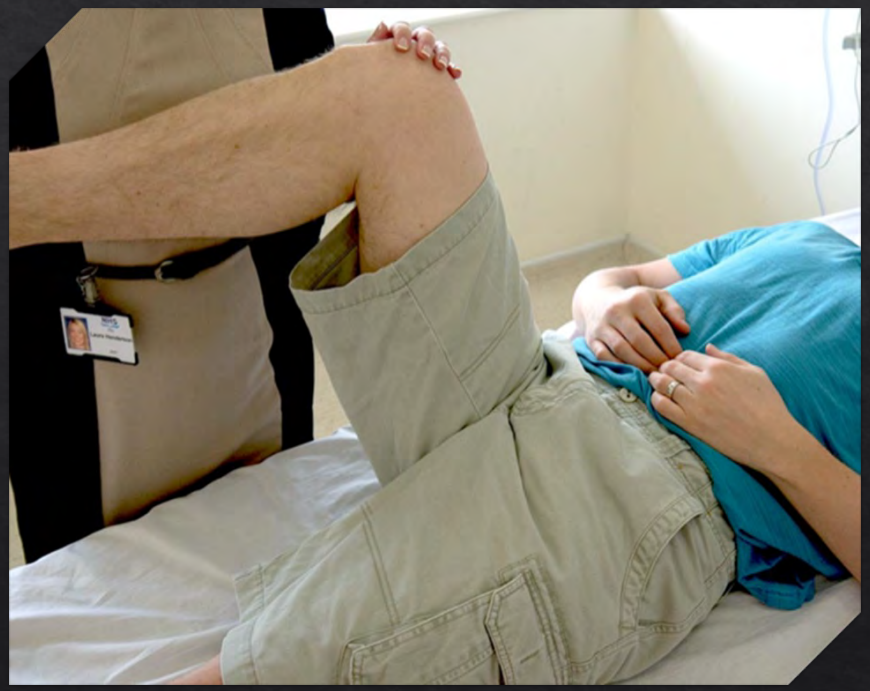
- Groin pain
- Anterior hip pain
- Mechanical symptoms
- Weakness in leg
- Sitting pain
- Pain with hip flexion
- Pain with weight bearing activity [1,2]



*not every patient presents with “text-book” complaints

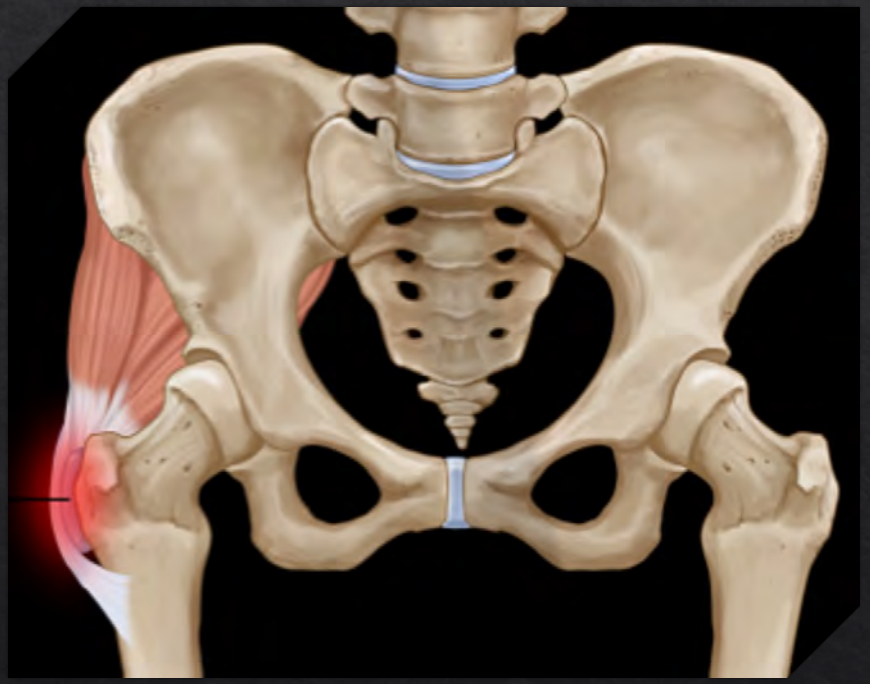
Hip Physical Exam

- Labral Pathology
- C-sign
- FADIR Test [8]
- Flexion adduction, internal rotation
- + Stinchfield test
- Resisted straight-leg raise
- Decreased/Painful Hip ROM
- Any tenderness?



Greater Trochanteric Bursitis

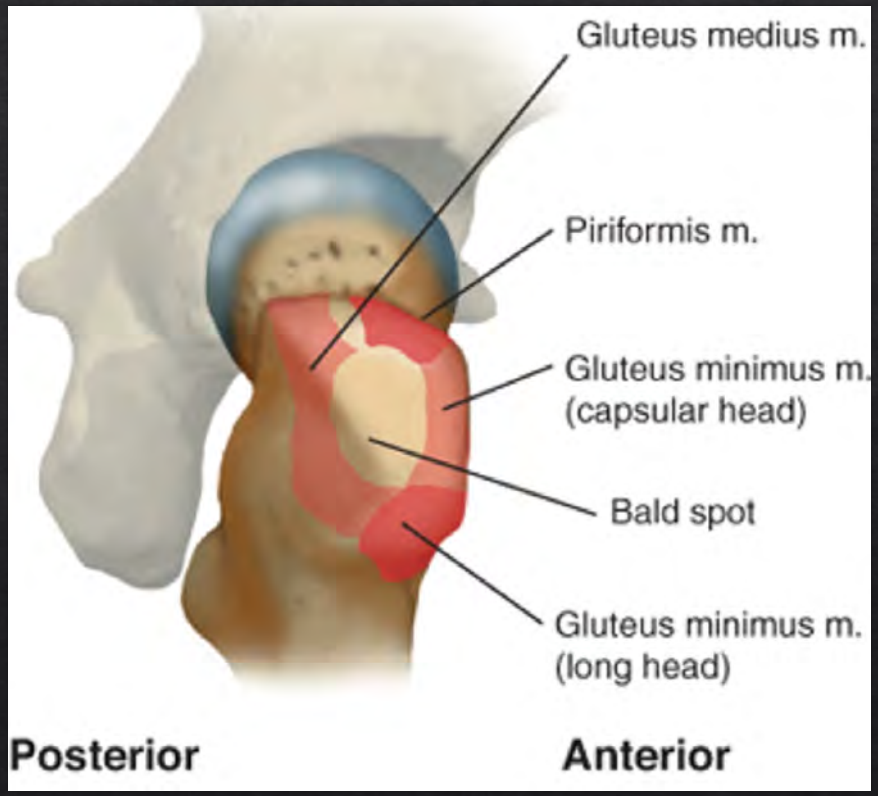
- Lateral hip pain
- Extra-Articular
- Inability to lay on affected side, walk
- IT Band pushes up against Bursa
- Over use/Under use
- Tenderness to greater trochanter
- Inject troch bursa with steroid, PT, NSAIDs
    - 10 mg/1ml Kenalog 1:4 lidocaine 1% 10mg/1ml



- IF no improvement, consider MRI to rule out Gluteus medius tear.
- Ortho referral

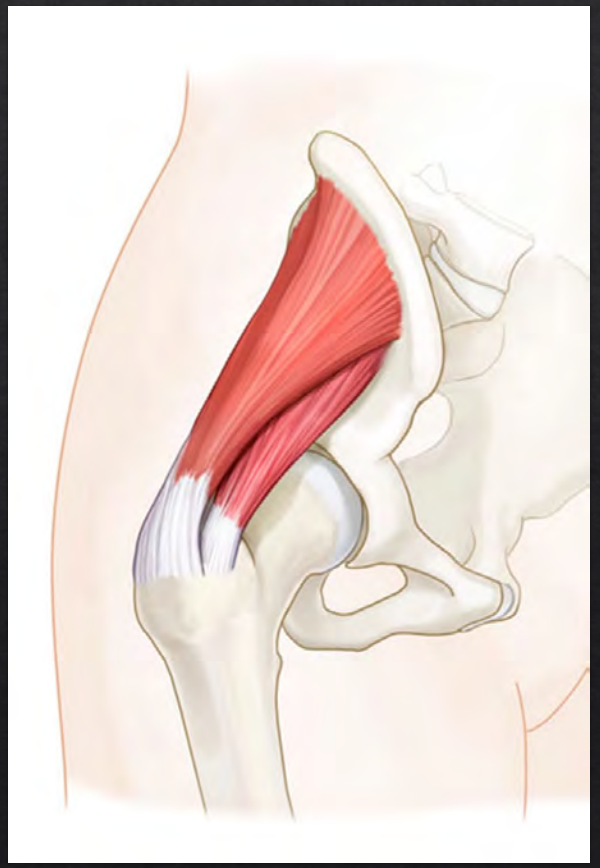
Gluteus Medius Tears

- Persistent lateral/posterior hip pain
- Failed conservative tx
- Risk Factors: age, female
- Causes: degenerative, fall
- +pain weight bearing, resisted abduction.
- Trendelenburg gait
- Function: stabilizes femoral head during ambulation, initiates hip abduction, external rotator of pelvis [10]



Gluteus Medius Facts

- Gluteus medius tendon = "rotator cuff of the hip"
- Medius & minimus analogous to supraspinatous & subscapularis
- 25% of middle-aged women and 10% middle-aged men will develop a tear of the gluteus medius tendon. [7]
- Tears are 4x more common in women than men.
- Inserts on superior posterior and lateral facets of greater trochanter.
- *think about this during PE, palpation, resisted ABDuction
- Most tears located anteriorly, at lateral facet of greater trochanter.



Hip Pathology

Labral Tear/Impingement

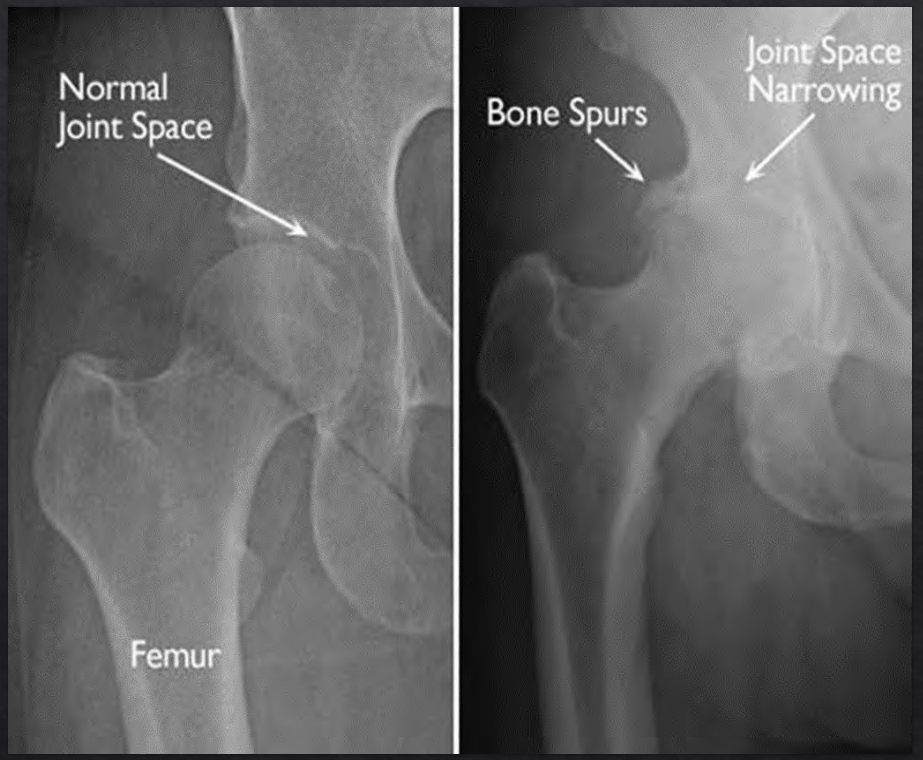
- Intra-articular
- +pain sitting, +fadir, +hip flexion, xray FAI
- MRA
- Anterior, +C-sign, Groin
- younger

Troch Bursitis/Gluteus Medius Tear

- Extra-articular
- +pain ambulating, laying on side, +adduction, peri-troch tenderness
- MRI
- Posterior, lateral hip
- Older
- Female

Hip Osteoarthritis

- Progressive, irreversible degenerative pathology
- Risk factors: >55 y/o, elevated BMI, family Hx
- Degradation of articular cartilage
- Osteophyte formation
- Subchondral bone sclerosis & cysts
- Identifiable on radiographs (weight bearing)
- Pain worse with activities, relieved with rest
- Pain can be sharp, dull, stiff
- **Contraindication to hip arthroscopy**



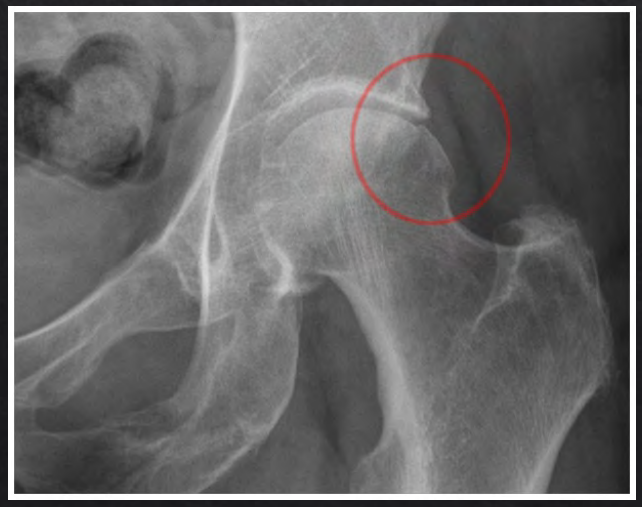
Osteoarthritis Treatment

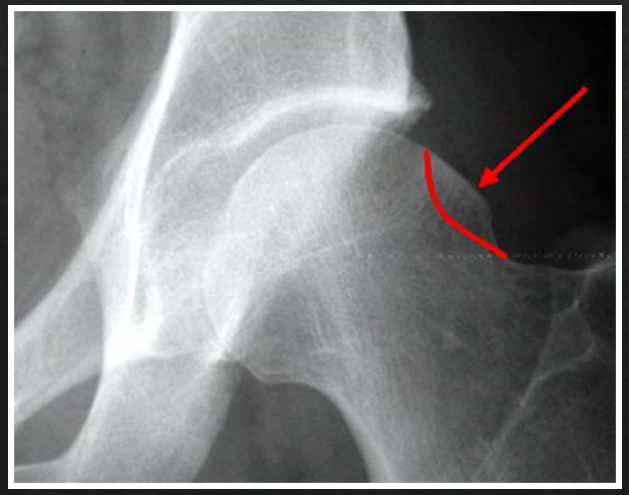
- Treatment options for Hip OA
- Medication: Acetaminophen, NSAIDs
- Physical Therapy
- Ergonomics – activity modification
- Joint Injection: guided-hip injection with steroid
- Total Hip Arthroplasty (Anterior vs Posterior), (MAKO)

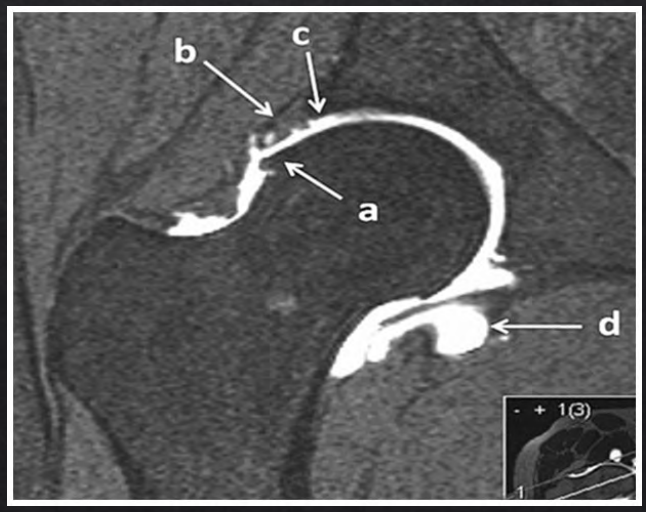
MRI vs MR Arthrogram?

- MRI – extra-articular, not looking at joint specifically, more soft tissue = glute pathology
- MRA – intra-articular contrast, looking at joint, labrum, degree of chondrosis

X-ray: AP weight bearing and frog leg lateral







Advanced Imaging Interpretation

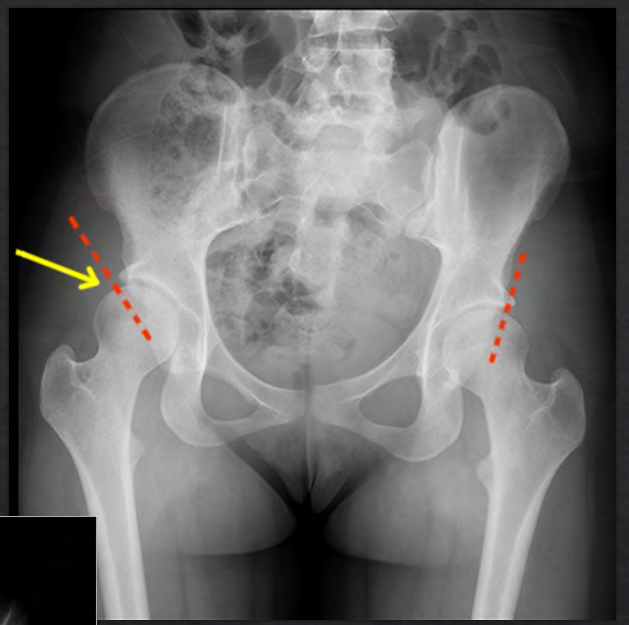
- Not every MRI/MRA machine is the same
- Magnet Strength, Sequencing
- Not every radiologist is the same
- Musculoskeletal radiologist specific to hips matters
- As a NP, interpreting the report + physical exam + chief complaints all matter!
- You want to recommend the right specialist for the right diagnosis!
- Special considerations – chronic steroid use, acute trauma, runners

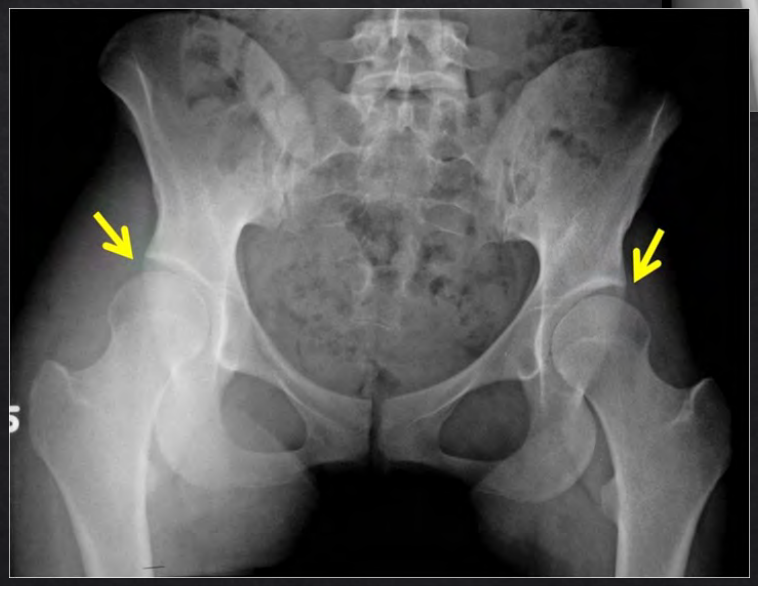
Treatment: Labral Tear

- In outpatient primary care –> Hip Specialist
- IF concerned for labral tear and do not have MR Arthrogram – > Hip Specialist
- **HIP PAIN is not normal**
- Is it the hip?
- Can patient bear weight?
- Duration of pain? How often (daily?)
- Mechanical complaints?
- IF complaints are consistent with a labral tear, imaging reveals impingement & labral tear & no extensive arthritis + irritable hip on exam. **Recommendation is to repair & preserve it!**
- Hip arthroscopy for pain and hip preservation – more to come!

Hip Dysplasia

- All ages! Females > Males
- Instability – Rare
- Under coverage of acetabulum
- Increased exposure of femoral head
- Lead to increased wear & tear on hip joint, early onset hip OA
- Complaints of hip pain, groin/lateral pain. +pain weight-bearing activity, +mechanical complaints
- PE: increased ROM, limping
- X-rays (tonnis, CEA)
- Mild vs. Severe
- Ortho Referral





Hip Dysplasia Treatment

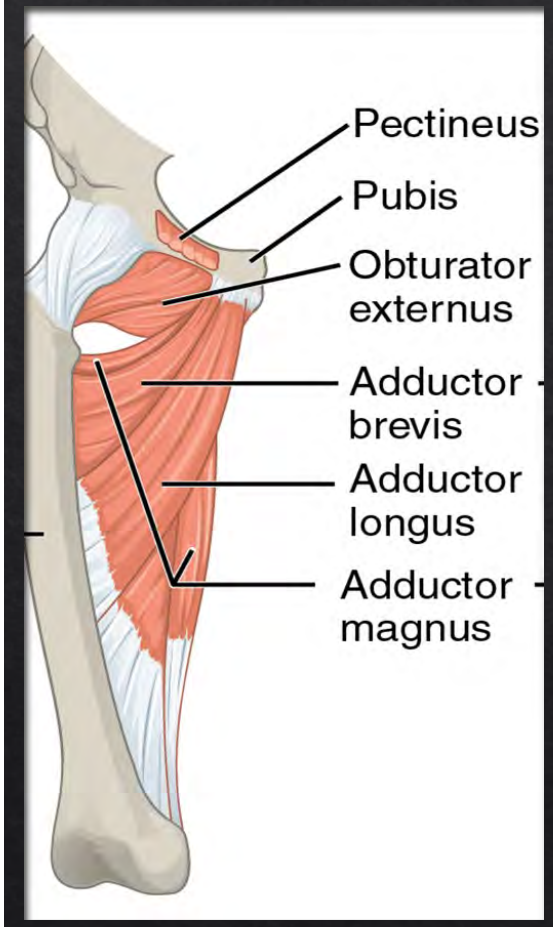
MILD

- Center Edge Angle (CEA) 18-25
- +MR, candidate for hip arthroscopy if also concurrent labral tear
- Rehab: big focus on glute strengthening in Physical Therapy

SEVERE

- Center Edge Angle <15 (sometimes single digits)
- Not a candidate for hip arthroscopy
- ORTHO REFERRAL (Age matters)
- Peri-acetabular osteotomy (PAO)
- Total Hip Arthroplasty (THA)

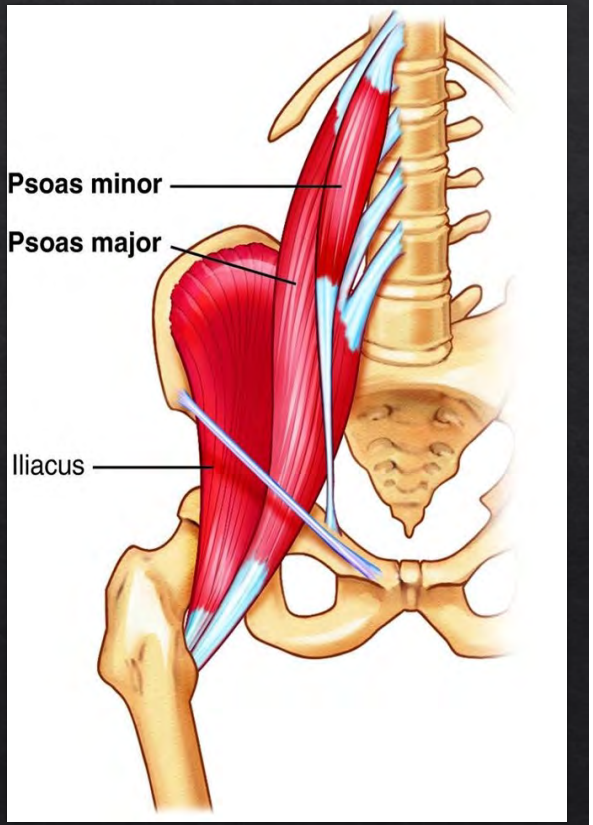
Adductor Strain



Common Sports Injuries

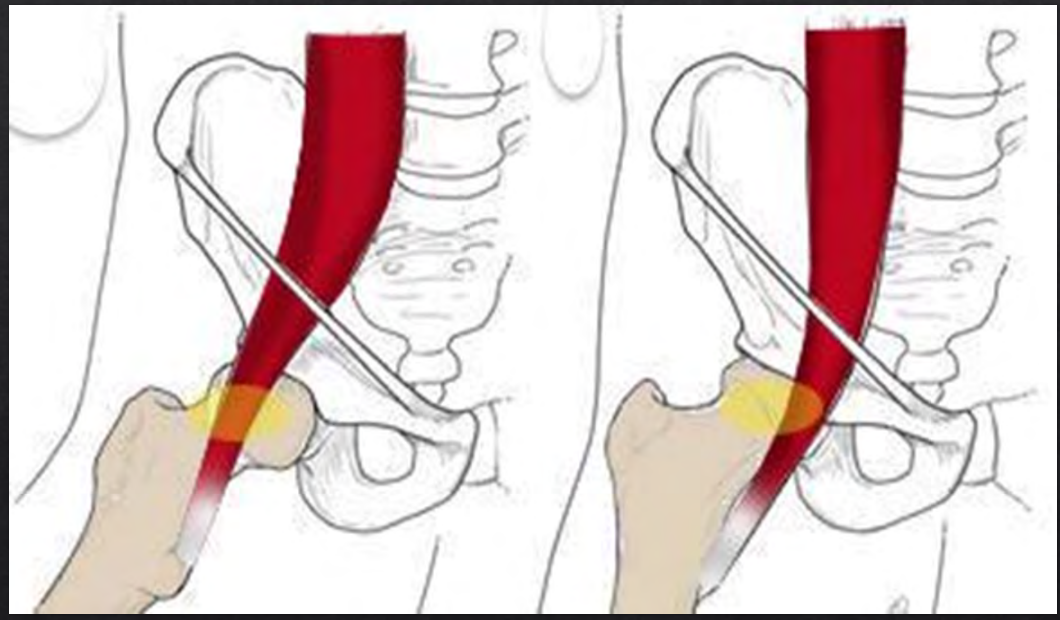
- Groin Strain, Hip flexor strain
- Complaints of groin pain
- History: kicking, sport injury, acute
- Physical Exam: Tenderness Adductor, iliopsoas
- Tx: Rest, ice, PT, MDP, NSAIDs, PRP
- Ortho referral – no improvement after 6 weeks conservative treatment

Iliopsoas Strain



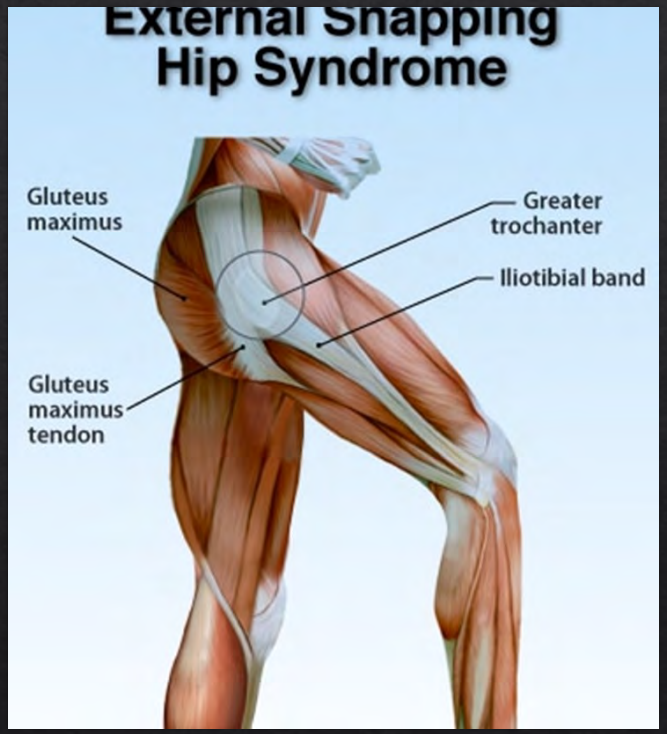
INTERNAL SNAPPING HIP

- HIP FLEXOR crosses over femoral head
- Anterior hip pain
- Dancers, runners – repetitive hip flexion
- + stinchfield, tenderness iliopsoas
- "complaints of popping"
- Treat conservatively



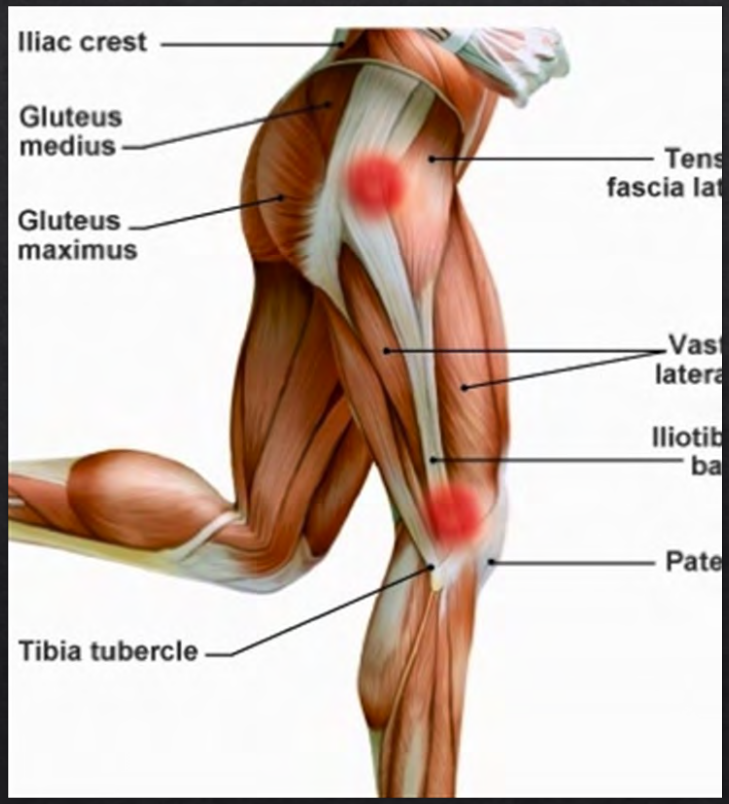
EXTERNAL SNAPPING HIP

- IT Band crosses over Greater Trochanter
- Lateral hip pain
- Common
- +FABER, tenderness ITB
- Complaints of “popping”
- Treat conservatively



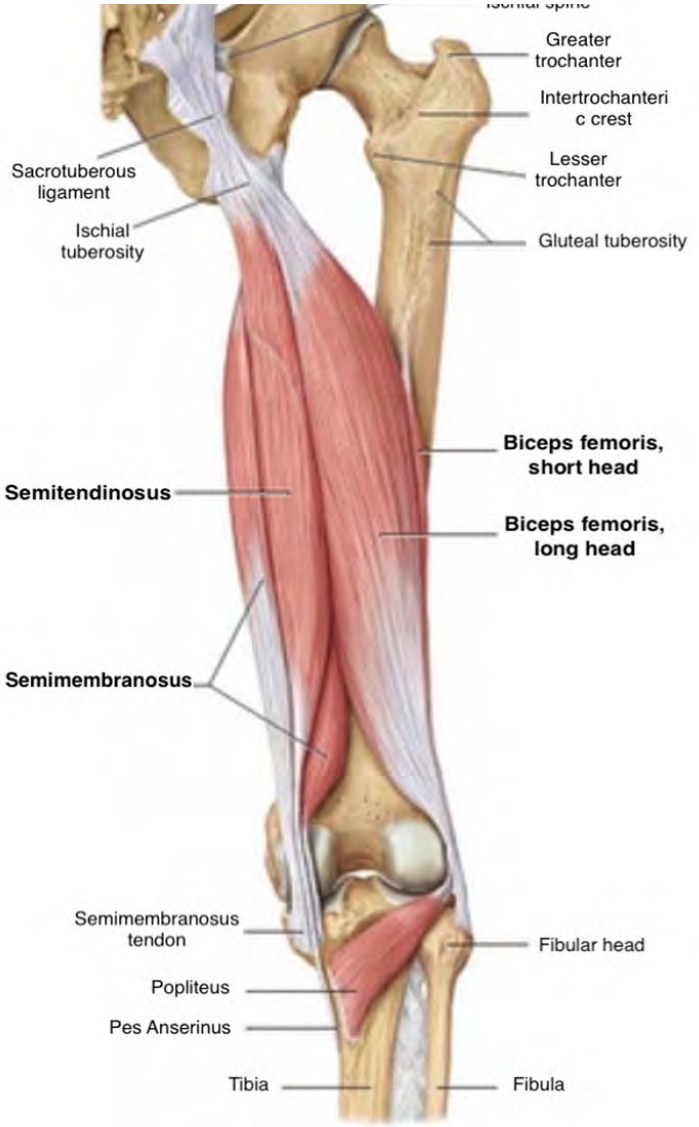
ILIOTIBIAL BAND SYNDROME

- Irritated IT Band, inflammation of the bursa
- Repetitive hip flexion: running, jumping, high-impact activity, prolonged sitting, increased activity, weak glutes, improper gait
- Tenderness IT band origin/insertion (lateral knee), tenderness greater troch
- Tx- Conservatively, PT, MDP for ITBS. F/U 6 weeks.
- PT: big focus on form, weak abductors contributing to contralateral pelvic tilt [3]
- Ortho referral if no improvement.



Hamstring Tears

- Acute Injury (most common)
- Result of sudden hip flexion and knee extension in running injury
- Textbook presentation: ecchymosis posterior thigh. tenderness over hamstring muscles and avoidance of knee extension
- MRI to confirm diagnosis – myotendinous junction, ischial tuberosity avulsion
- Treat conservatively* (avulsive tear, multiple tendon involvement may involve surgery)



Slipped Capital Femoral Epiphysis (SCFE)

Adolescents

- Age Range : 10-16 boys & girls
- Rapid adolescent growth

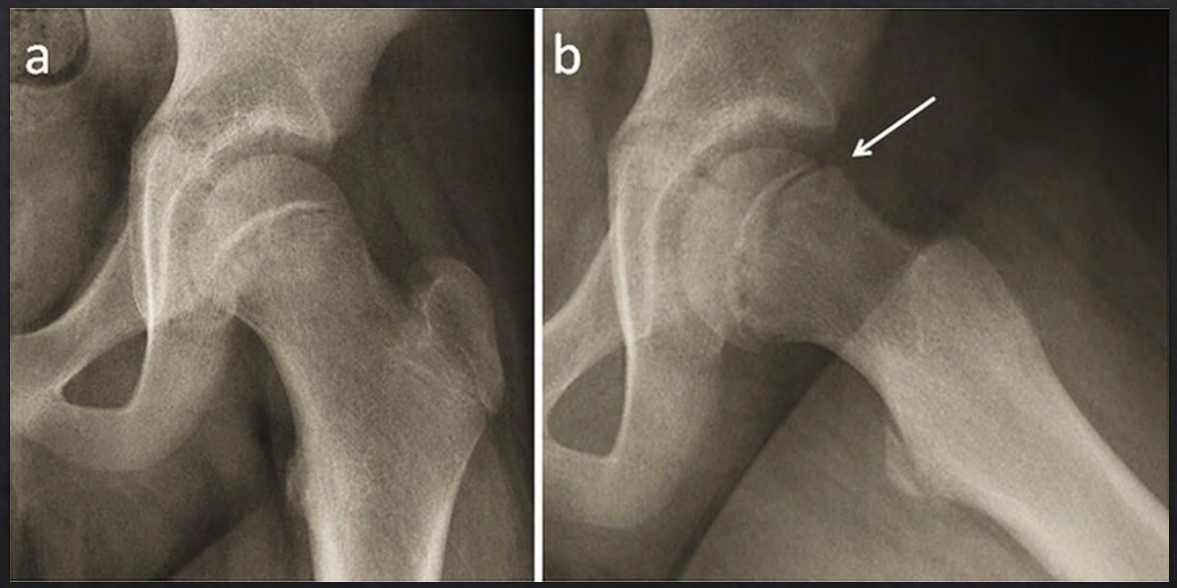
- Femoral head has shifted down off growth plate
- "Ice cream fell off the ice cream cone"
- **Xray diagnosis – standing AP & lateral**

- Young adolescent cannot bear weight
- Hip pain, groin pain, +pain walking, limping
- Risk factor: obesity (>95% for weight)
- PE: +pain ROM, abnormal gait, limited ROM

- Treatment: STAT PEDS ORTHO REFERRAL - surgery

SCFE Radiographs

Can see SCFE on lateral- slipped femoral head on epiphysis (growth plate)



Standing AP- can look benign

Legg Calve Perthes

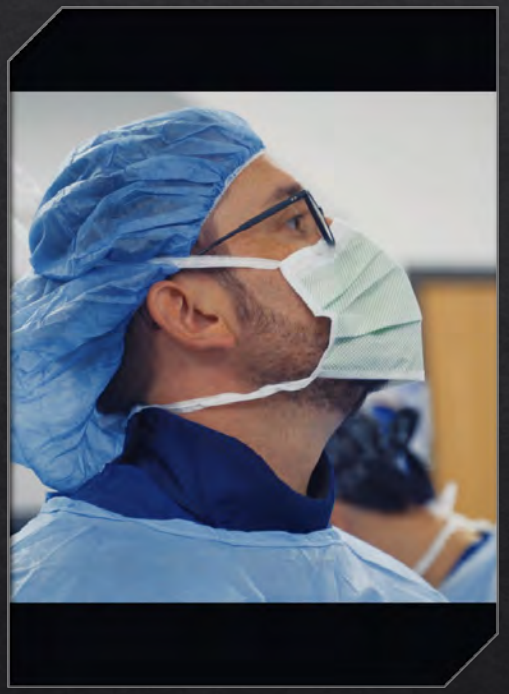
- Age ranges: 4-10, more common in boys
- Disruption of blood flow to femoral head
- Results in necrosis
- Complaints of hip/groin pain
- PE: painful walking/running, decreased ROM
  - (esp. abduction)
- Xray diagnosis
- Treatment – PEDS ORTHO REFERRAL!
- Observation, NSAIDS, limited high impact activity, PT
- Casting, Bracing, Surgery

Hip Arthroscopy: for Pain & Preservation of the Hip Joint

- Lower complication rates compared to open [1]
- Outpatient surgery
- Faster Rehabilitation rate than open
- Minimal blood loss
- Better Cosmetically
- Labral tears
- Minimal OA
- Hip Impingement
- Revision Hip Surgery
- 2 small (1cm) incisions

Hip Arthroscopy

- Address labral tear & underlying hip impingement
- Patient outcomes tied to surgeon experience
- Less experienced surgeon increased likelihood of patient needing additional hip surgery
- Surgeon case volume >519 had lower risk of subsequent hip surgery.
- **2-3x increased risk for further surgery in less experienced surgeons.**
- Residual impingement
- Poor candidate (OA, dysplasia)
- Experience guides surgeons in choosing candidates wisely
- **Dedicated hip arthroscopy fellowship**
- Labral Reconstruction



Mehta, N., Chamberlin, P., Marx, R., Hidaka, C., Ge, Y., Nawabi, D. & Lyman, S (2018). Defining the learning curve for hip arthroscopy: A Threshold analysis of the volume-outcomes relationship. American Journal of Sports Medicine, 46(6). doi: 10.1177/0363546517749219

Hip Arthroscopy : Patient Prognosis

- Dependent on articular surface involvement
- 90% of patients with excellent results if the chondral surfaces are intact
- ADOLESCENTS!
- Grade I or II chondral lesion 70-80% will have good to excellent results.
- If the articular cartilage involvement is full thickness and diffuse, 40-50% will require total joint arthroplasty within two years of arthroscopy. [4]

Hip Arthroscopy

- Minimally invasive with lower complication rates
- Studies show experience matters
- Hip pathology is real and needs to be addressed
- Pathology is commonly felt anteriorly
- Post op rehab is critical!
- PWB 4 weeks, sedentary til 6 weeks, no restrictions @12 weeks unless revision hip surgery.

APRN RNFA

- Credentialing Committees required RNFA training
- APRNs follow patients through the entire process (clinic, pre-op, intra-op, post-op)
- APRNs greatly help the doctors workload
- APRNs can bill Medicare Medicaid
- NIFA (National Institute of First Assisting)

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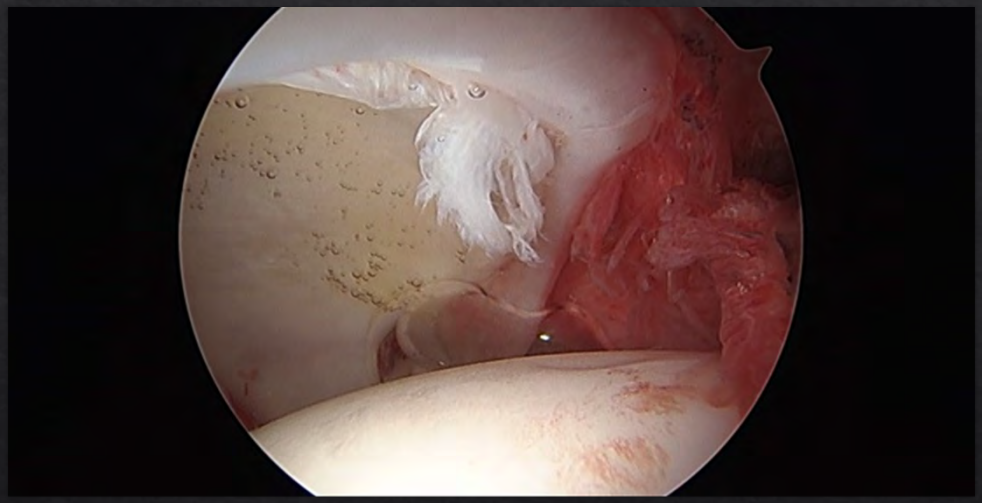
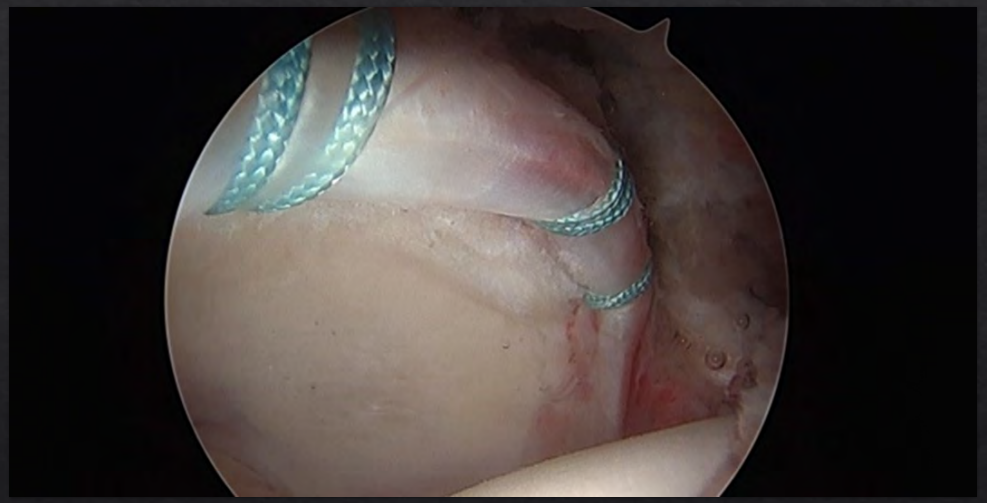
Chief Executive Officer

Hip Arthroscopy: Pain & Preservation

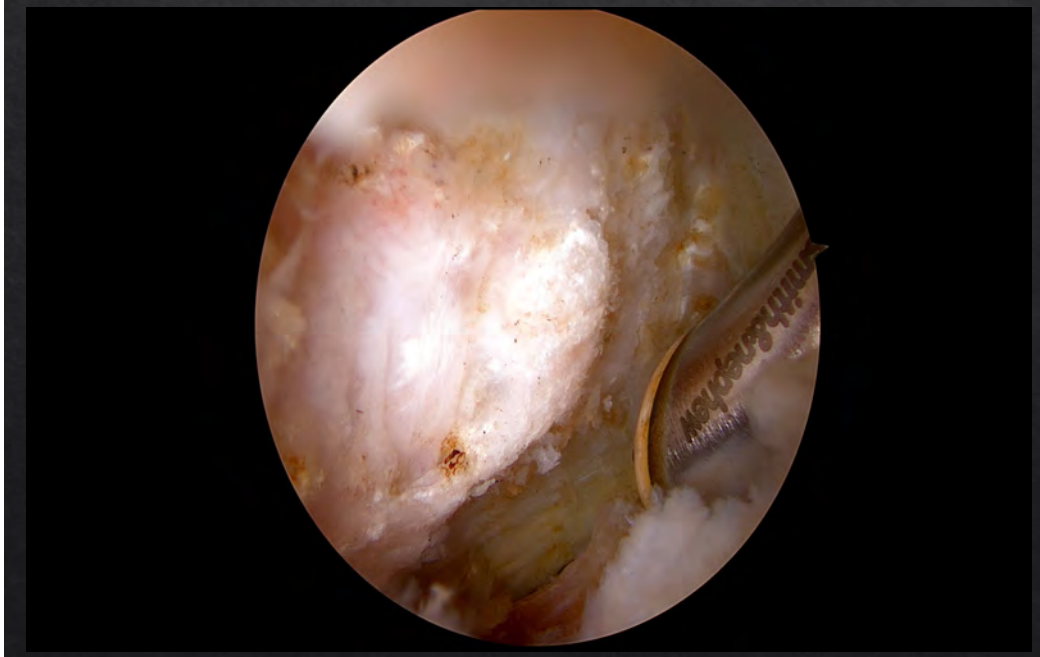




Hip Arthroscopy : Pain & Preservation

CAM Deformity

Before



After

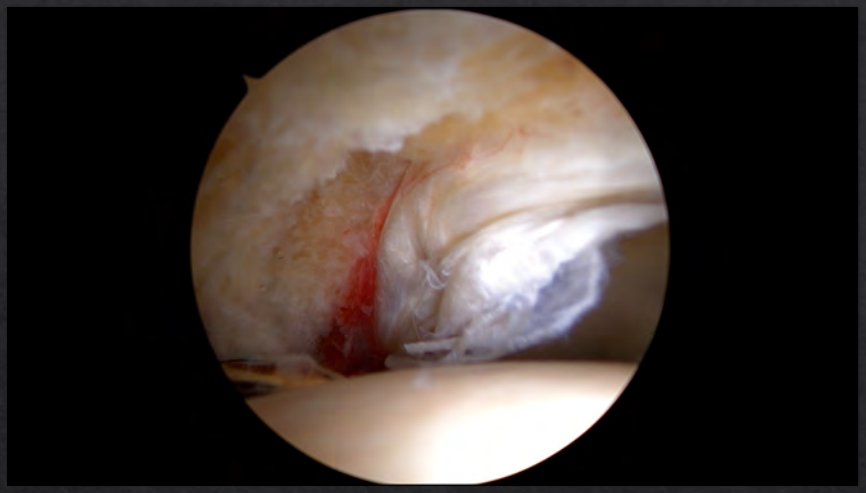
Hip Arthroscopy : Pain & Preservation

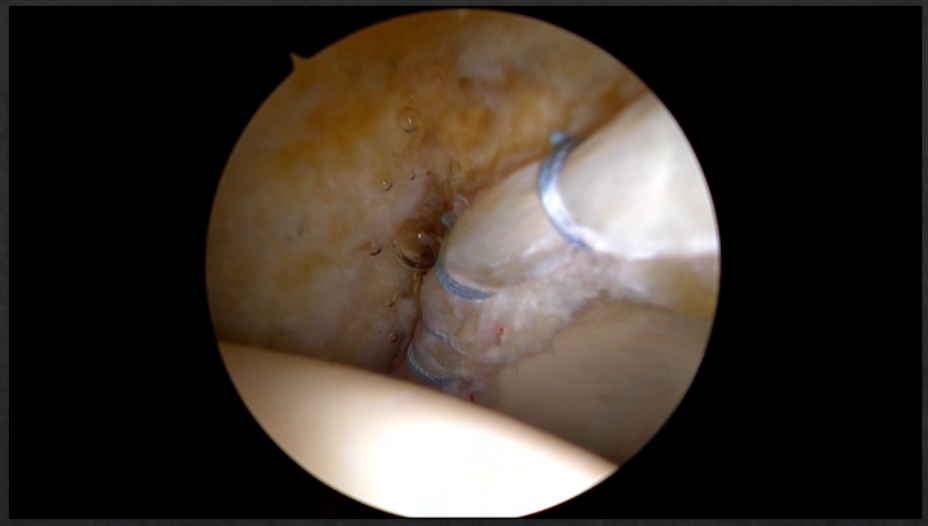
Pincer Deformity

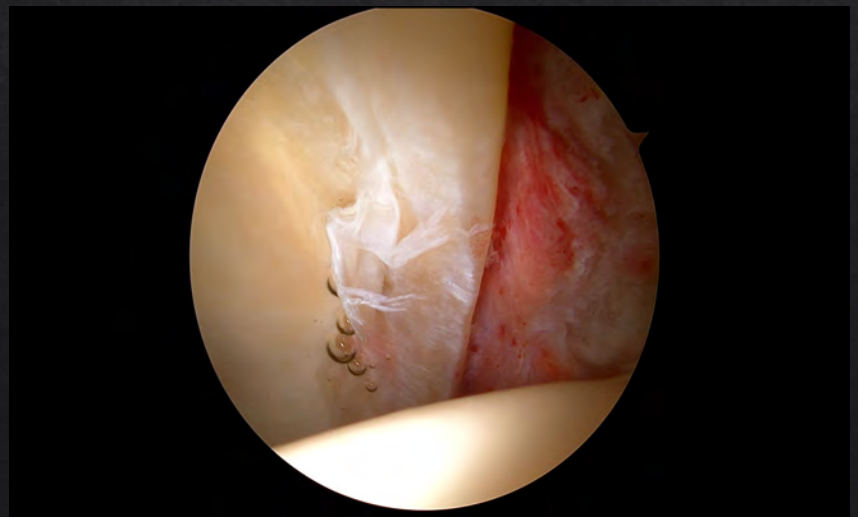
Hip Arthroscopy : Pain & Preservation

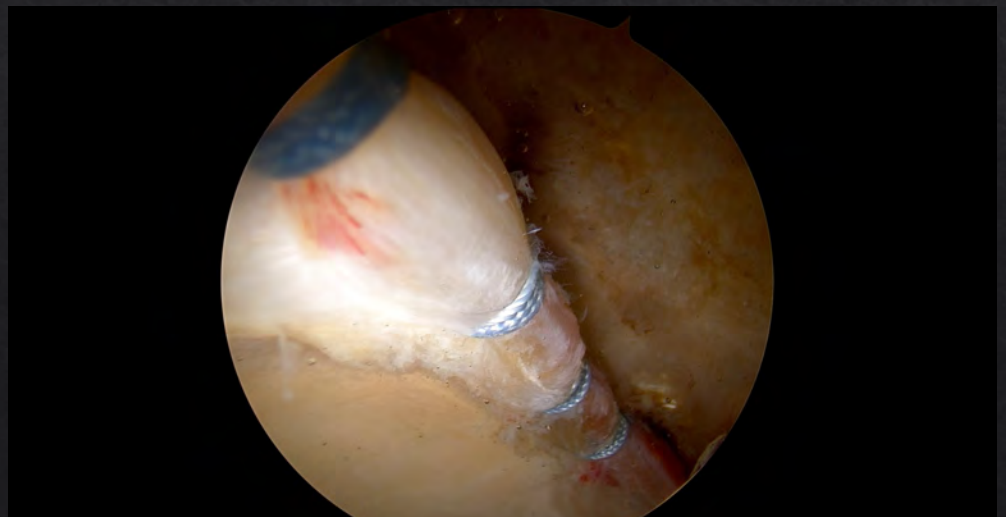
Labral Repair

Hip Arthroscopy : Pain & Preservation

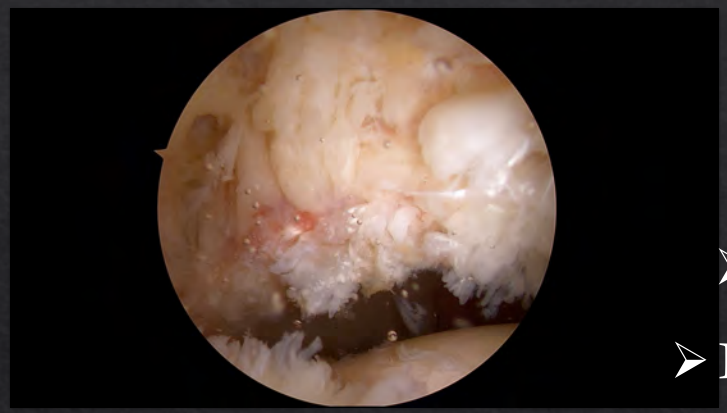


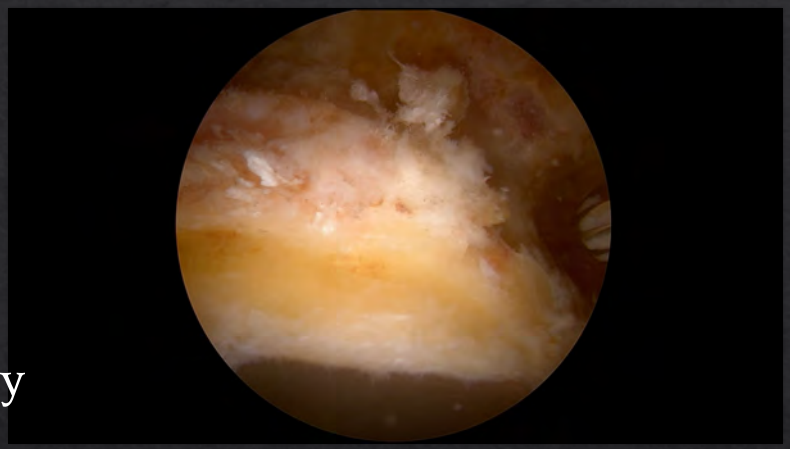




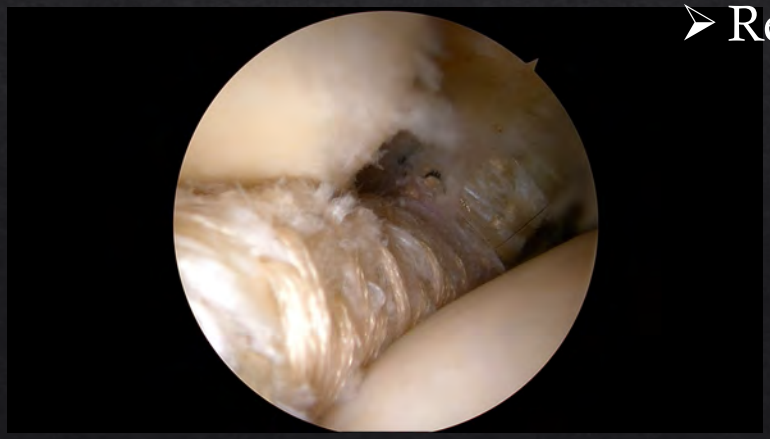


Hip Arthroscopy: Labral Reconstruction

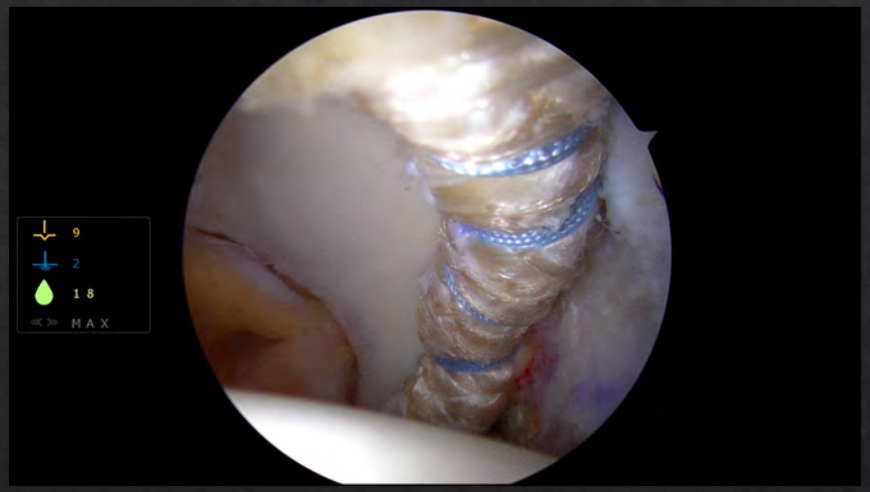


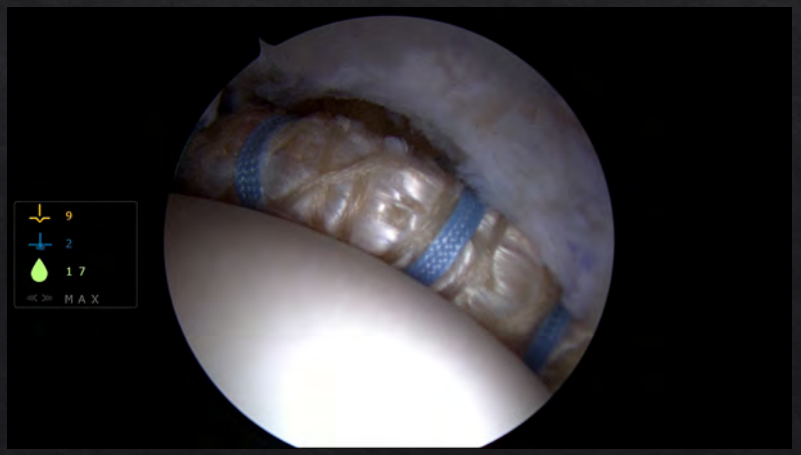


- Revision Setting
- Failed Prior Surgery
- Residual Impingement



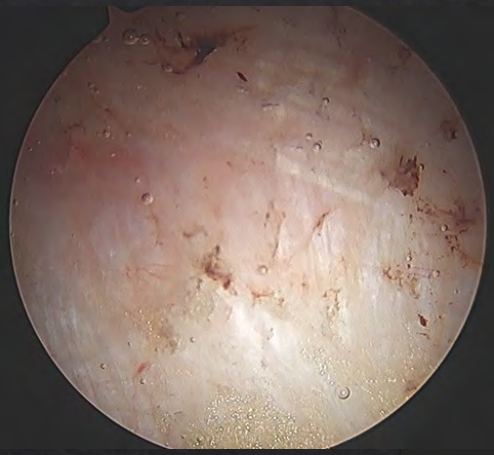
Hip Arthroscopy: Labral Reconstruction



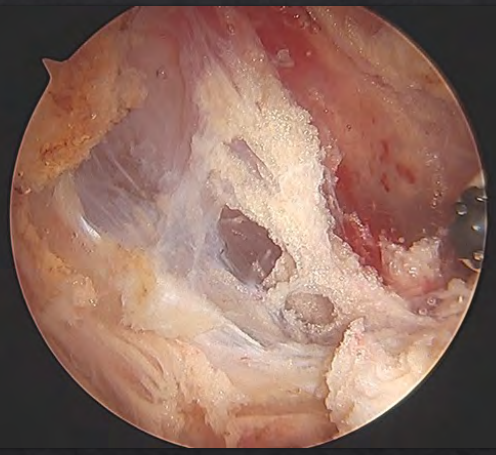


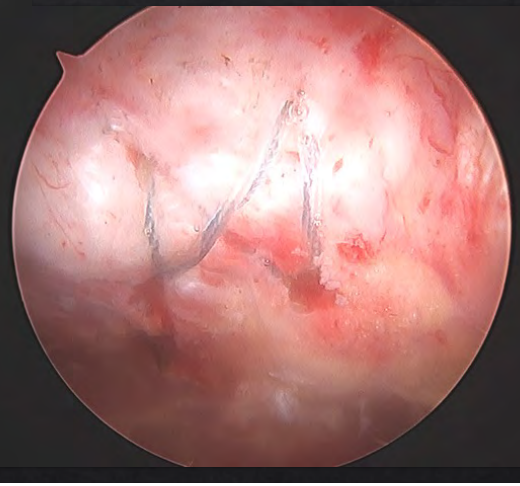
Arthroscopic Gluteus Medius Repair

IT Band Lengthening



Trochanteric Bursectomy

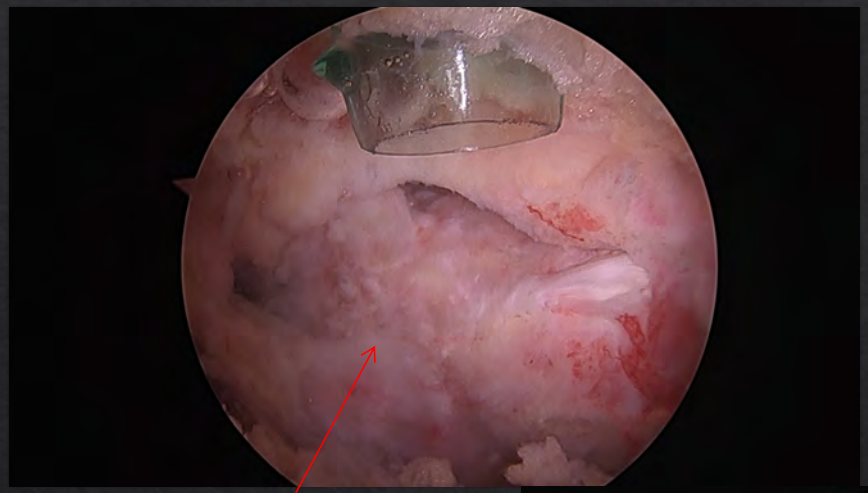


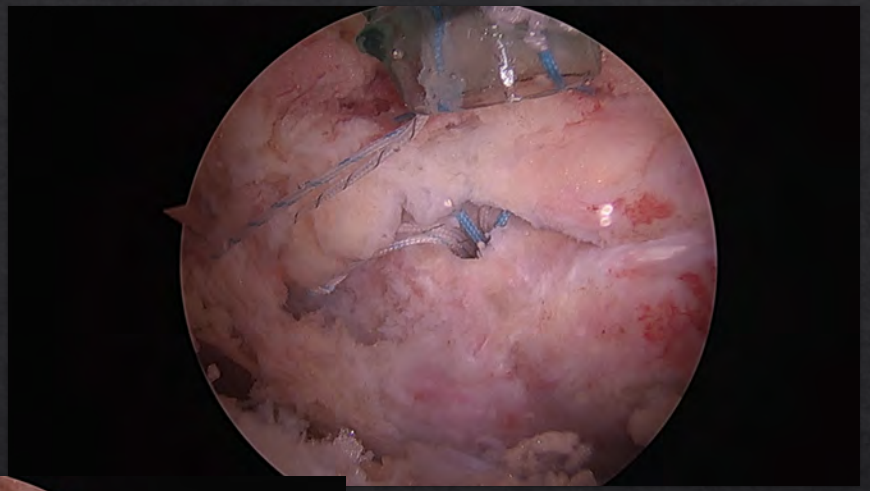


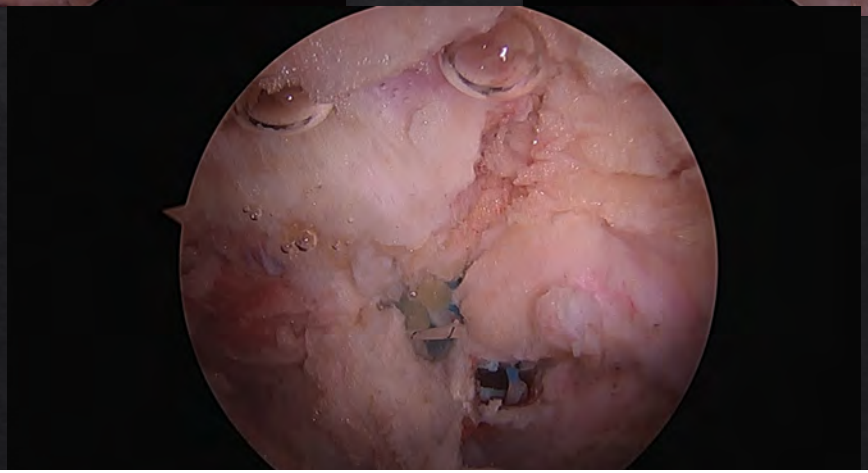
Partial Thickness Gluteus Medius Repair

Arthroscopic Gluteus Medius Repair

Full-Thickness Glute Repair –Arthroscopic vs Open







Gluteus Medius Repair

Arthroscopic vs Open

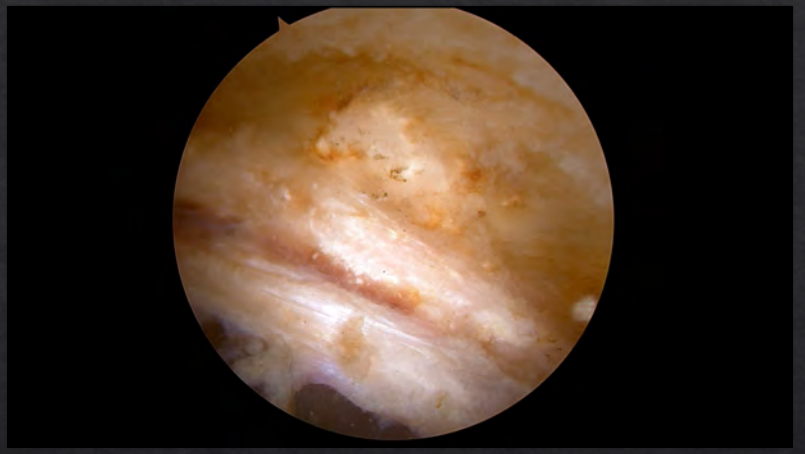
- Considerations – has the patient had prior surgery?
- These patients cannot walk
- Have to do an open approach to repair it
- MRI considerations – atrophy, retraction, edema
- As the provider, you want to recommend the right surgery done well.

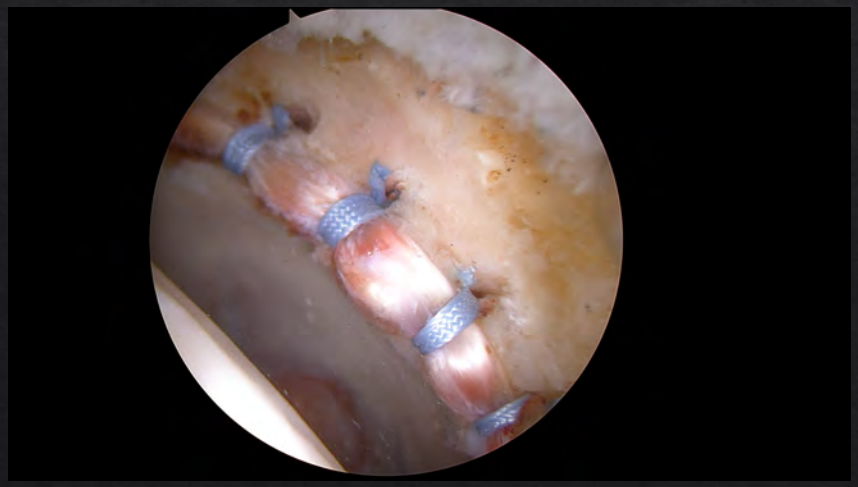
Case Studies @TheHipClinic

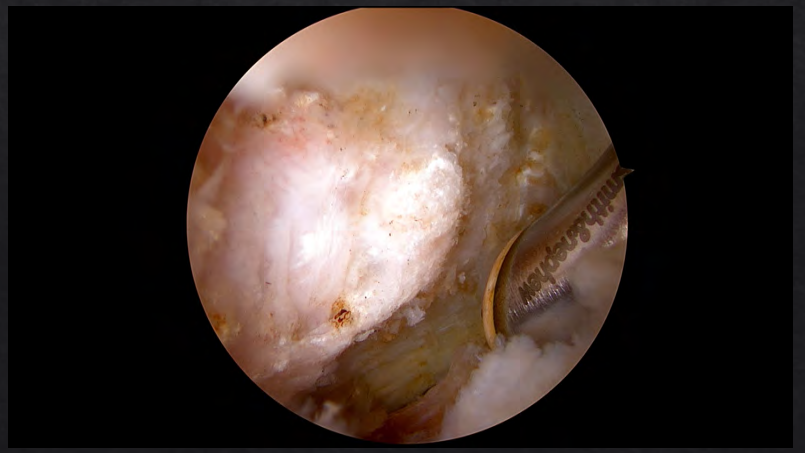
- HPI – Young female, pain x4 years, injured while playing sports, anterior hip, groin pain, did PT, saw another ortho, recommended PRP to the joint, recommended against surgery. Saw us for second opinion, recommended surgery to repair labrum and hip FAI. Hip irritable on exam.

- MRA Hip – Subtle cam lesion with blunting of the labrum, likely representing a small partial labral tear with no evidence of full-thickness tear.

Intraoperative Images

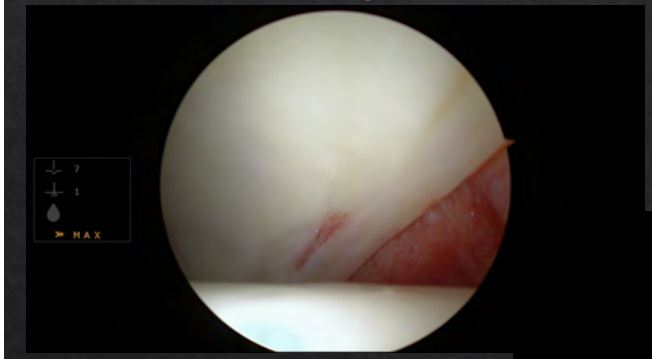


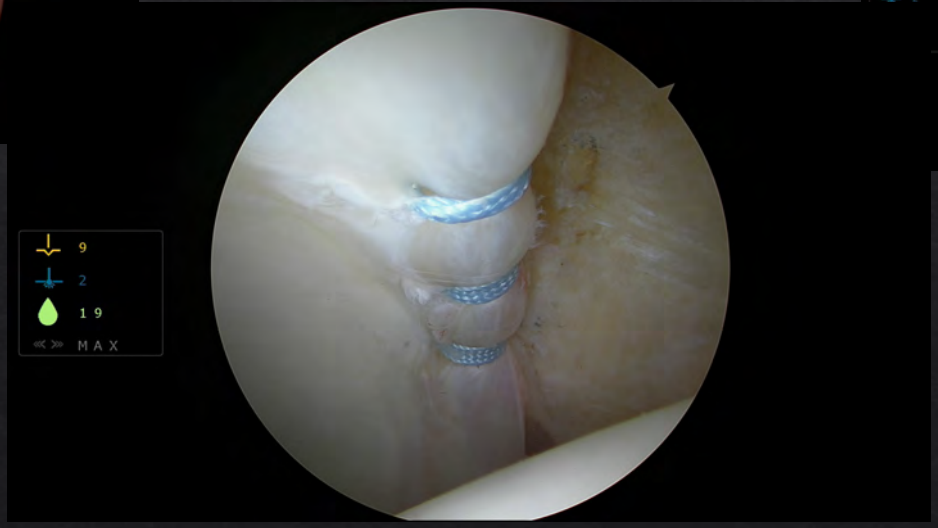




Case Study @TheHipClinic

- HPI – Teenage female, injured while playing soccer, pain x2 years to anterior hip and groin, +pain hip flexion and weight bearing activity. Brings MR Arthrogram stating no tear. Hip irritable on exam. Recommend overread of her report by MSK fellowship-trained radiologist. Overread report indicates hip FAI and labral tearing. Recommend surgery.





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Thank you!

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