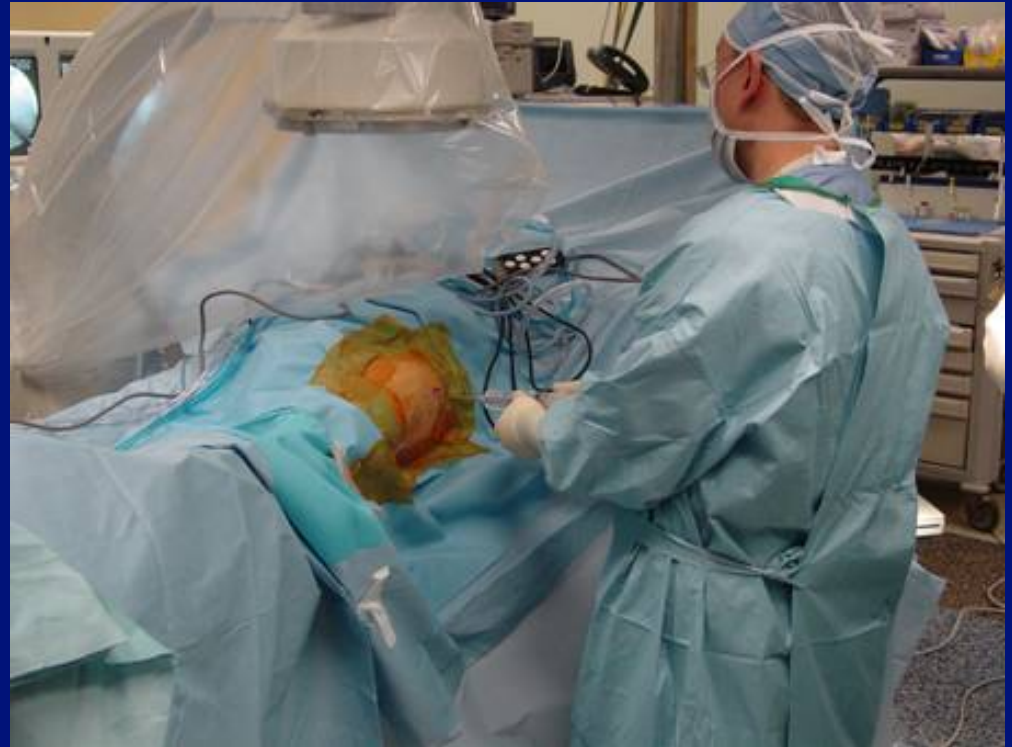
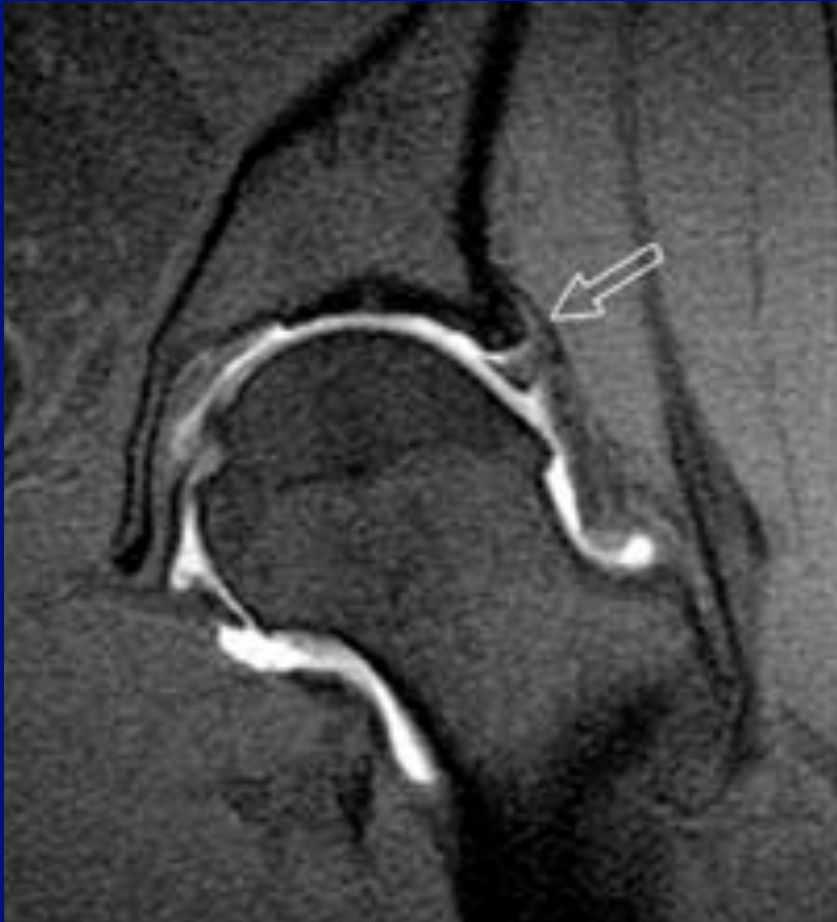


HIP ARTHROSCOPY: AN OVERVIEW



Purpose

- Review causes of hip and groin pain in athlete
- Discuss indications for hip arthroscopy
- Review, if any, history & physical findings of a patient who may benefit from hip arthroscopy
- Review portal placement and anatomy
- Review literature on outcomes of hip arthroscopy

AAOS OKU Sports Med 2

“Groin Pain in the Athlete”

- Athletic Pubalgia
 - Rectus abdominus insertion with pain in inguinal canal
 - Adductor longus inflammation
- Adductor (Groin) Strain
- Piriformis Syndrome
- Hamstring Syndrome
 - Pain overlying ischial tuberosity

AAOS OKU Sports Med 2

“Groin Pain in the Athlete”

- Snapping Hip
 - Iliopsoas gliding over iliopectineal eminence or femoral head
 - IT band over greater troch
 - Biceps over ischial tuberosity
 - Iliofemoral ligaments over femoral head

AAOS OKU Sports Med 2

“Groin Pain in the Athlete

- Iliopsoas tendonitis
- Iliotibial band syndrome
- Osteitis Pubis
 - R/O infx, frx, neoplasm, prostatitis, endometriosis, tendonitis
 - Primary (noninfectious inflammatory condition secondary to repetitive micro trauma) vs. secondary

AAOS OKU Sports Med 2

“Groin Pain in the Athlete

- Contusion
- Hip pointer (ASIS)
- Bursitis
- Fractures
 - Stress
 - Pelvis
 - Femoral neck
- Apophyseal avulsion (ASIS, AIIS, Ischial tuberosity)
 - Traumatic
 - SCFE

AAOS OKU Sports Med 2

“Groin Pain in the Athlete”

- Intra-articular pathology
 - Synovitis
 - Loose bodies
 - Labral tears
 - AVN
 - DJD

Hip Arthroscopy

- Not frequently performed
- Difficult because:
 - Highly constrained joint
 - Deeply constrained by muscular & capsular attachments
 - Surrounding neurovascular structures at risk
- Equipment is improving

Diagnostic Applications of Hip Arthroscopy

- Evaluation of hip pain
- Use as a diagnostic tool when have intractable hip pain with reproducible physical findings and functional limitations which fail to respond to traditional conservative measures
- Intra-articular pathology often not evident on plain x-ray, CT, or MRI
- The most common physical finding suggestive of an intra-articular disorder is a painful inguinal click when hip is extended from a flexed position.

Symptoms of loose bodies:

- Locking
- Anterior inguinal pain

Symptoms of Acetabular Labral tears:

- Anterior inguinal pain
- Painful clicking
- Transient locking
- Giving way
- Positive Thomas extension test

Symptoms of a Chondral defect

- Anterior inguinal pain
- Hip arthroscopy should not be performed for nonspecific pain

Therapeutic Applications of Hip Arthroscopy

- Synovitis
 - Difficult to diagnose
 - Yield biopsy specimen
 - Synovectomy

Therapeutic Applications of Hip Arthroscopy

- ?efficacy of synovectomy in hip arthroscopically
- Septic Arthritis
 - Culture specimens
 - Debridement
 - Placement of suction drains
- Loose bodies
 - Arthroscopic removal

Therapeutic Applications of Hip Arthroscopy

- Osteoarthritis
 - Aid in staging
 - Indicated in young patient with residual joint space who has failed traditional conservative therapy
 - Recent acute change in symptomatology
 - Debridement of chondral flaps

Therapeutic Applications of Hip Arthroscopy

- Torn Labrum
 - Role of acetabular dysplasia
 - Lack of lateral and anterior coverage
 - Higher incidence of labral tears
- Ligamentum Teres defect and Synovial Folds
- Pediatric Infections

Therapeutic Applications of Hip Arthroscopy

- Avascular Necrosis of the Femoral Head
 - Diagnostic purposes
 - Assess for possible vascularized fibula
 - R/O chondral flap tears
 - Total hip arthroplasty
 - Debris removal
 - Loose cement

Anatomic Structures at Risk

- Femoral artery
- Femoral nerve
- Lateral femoral cutaneous nerve (LFCN)
- Sciatic nerve
- Gluteal vessels

Distance from portal to anatomic structures Byrd, Arthroscopy, 1995, 11(4)

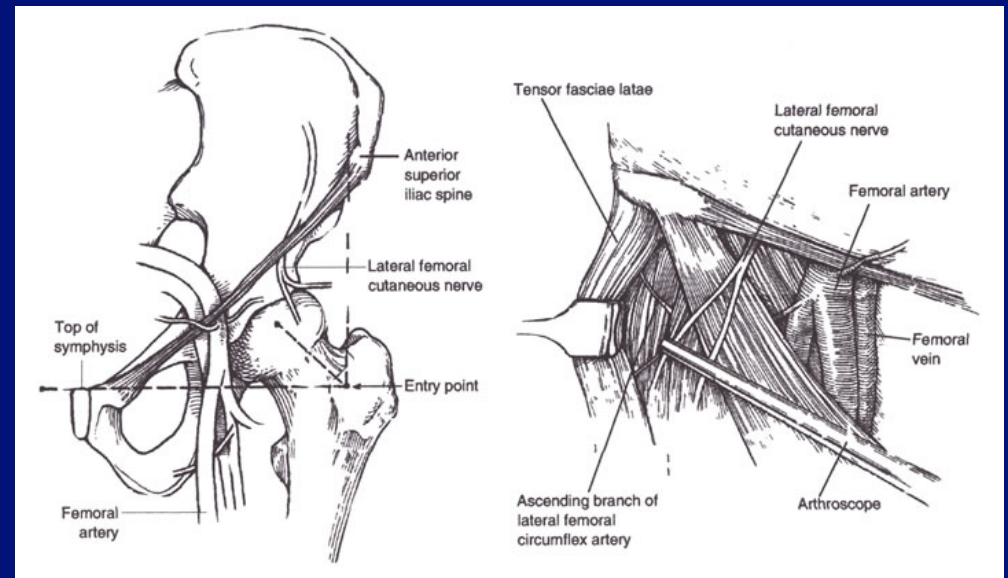
- Anterior
 - ASIS – 6.3 cm
 - LFCN – 0.3 cm
 - Femoral nerve at level of sartorius – 4.3 cm
 - Femoral nerve at level of rectus femoris – 3.8 cm
 - Femoral nerve at level of capsule – 3.7 cm
 - Ascending branch of lat circumflex art. – 3.7 cm

Distance from portal to anatomic structures Byrd, Arthroscopy, 1995, 11(4)

- Anterolateral
 - Superior Gluteal nerve – 4.4 cm
- Posterolateral
 - Sciatic Nerve 2.9 cm

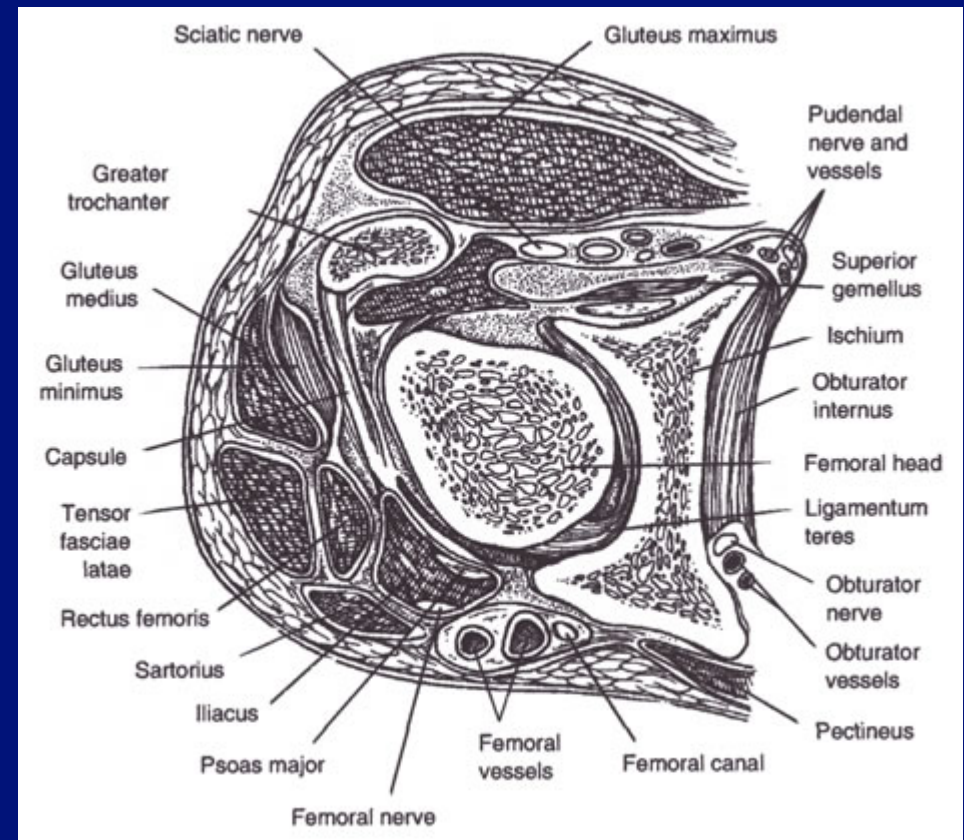
Anterior (Anterolateral) Portal

- Junction between horizontal line at pubic symphysis and vertical line from ASIS
- Angle 45 degrees medially & cephalad
- Very close to LFCN, avoid by minimizing skin incision
- Scope visualization of anterior neck, superior retinacular fold, and ligamentum teres
- 70° scope necessary for visualization of anterior labrum



Anterior Paratrochanteric Portal (Anterolateral)

- 2 to 3 cm anterior & 1 cm proximal or distal to the greater trochanter
- Visualization of anterior neck and head, capsular folds, and labrum
- If too anterior on approach can damage NV bundle
- Superior gluteal nerve at risk in its course through the gluteus medius

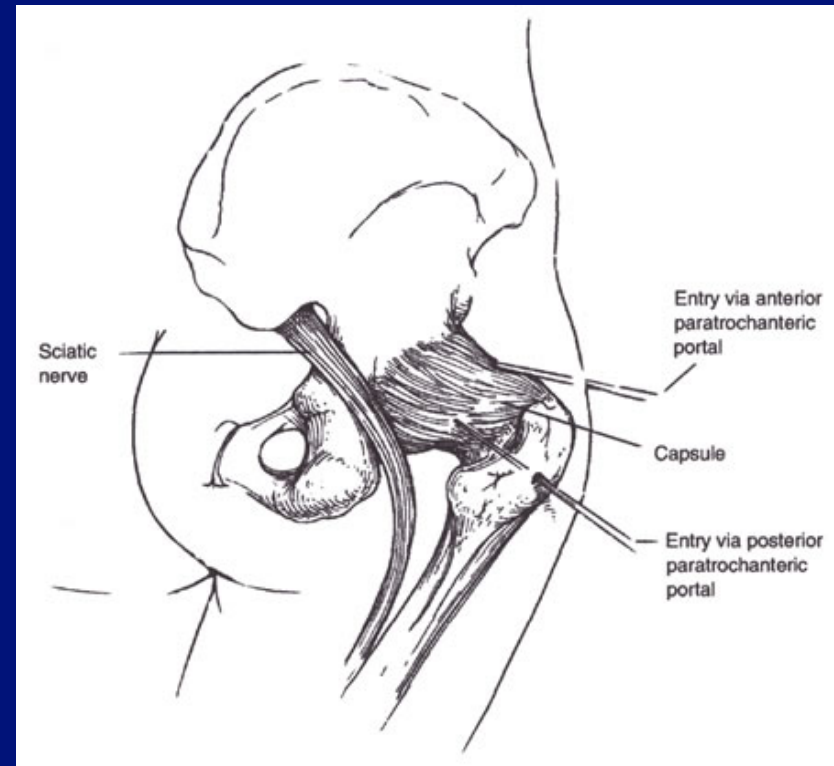


Proximal Trochanteric Portal

- 2 to 3 cm proximal to greater troch
- Directed medially & slightly superiorly
(aim toward center of hip)
- Visualization of labrum, femoral head, and fovea.

Posterior Paratrochanteric Portal (Posterolateral)

- 2 to 3 cm posterior to the greater trochanter
- Sciatic nerve at risk. Especially if leg is externally rotated
- Visualization of posterior capsule



Joint Distraction

- Forces can be very high (25 – 200lb)
- Contribution of physiologic negative intra-articular pressure
- Good anesthesia
- Hip flexion and internal rotation can increase anterior capsular space (but draws sciatic nerve closer posteriorly)
- Lateral vector should also be used to obtain some lateral subluxation

Positioning

- Supine vs. Lateral
- Some of the laterally based portals allow better access to labrum anteriorly

Supine Position

- Position on table
- Peroneal post positioned for some lateralization with distraction
- Goal of appx 1 cm distraction
- Inject joint to insufflate joint capsule and release vaccum. This will enhance ability for distraction
- Anterolateral portal is made first
- Anterior portal is then made under direct visualization
- Make posterolateral portal

Arthroscopic Anatomy

- From Anterolateral portal
 - Anterior wall and anterior labrum
- From Posterolateral portal
 - Posterior wall and posterior labrum
- From Anterior portal
 - Lateral labrum and its capsular reflection
- Articular surface visualization enhanced by IR & ER of leg
- Difficult to see inferior capsule, inferior acetabulum, and transverse acetabular ligament

Contraindications

- Conditions that limit joint distraction
 - Protrusio acetabuli
 - End-stage DJD
 - Ankylosing spondylitis
 - AVN – pressure changes may effect already compromised femoral head blood supply

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

Labral Tears

- Difficult to diagnose
- May not be seen on MRI or double contrast CT-arthrography
- Fluoro guided diagnostic injection often helpful in differentiating b/w intra- vs. extra-articular pathology
- Despite ineffectiveness in diagnosing labral pathology, MRI is necessary to r/o Stage I AVN

Byrd & Jones, "Prospective Analysis of Hip Arthroscopy with 2-Year Follow-up,"
Arthroscopy, Vol. 16, No. 6, 2000, 578-587.

- Outcome study of heterogenous patient population with hip pain.
- 38 procedures on 35 patients with minimum of 2-year follow-up
- Harris Hip scores pre-op & 1, 3, 6, 12, & 24 mo. post-op or until subsequent procedure
- Variables studied: Age, sex, duration of symptoms, onset of symptoms, CE angle, diagnosis, worker's comp, and pending litigation.

Byrd & Jones, "Prospective Analysis of Hip Arthroscopy with 2-Year Follow-up,"
Arthroscopy, Vol. 16, No. 6, 2000, 578-587.

- Median Harris Hip scores improved from 57 to 85
- 10 cases (9 patients) underwent second procedure at avg of 10 mo.
- Diagnoses:
 - Labral pathology = (23)

Byrd & Jones, "Prospective Analysis of Hip Arthroscopy with 2-Year Follow-up,"
Arthroscopy, Vol. 16, No. 6, 2000, 578-587.

- without chondral injury = 31 point improvement
- with chondral injury = 18 point improvement
- Chondral damage = (15) = 18 point improvement
- Arthritic disorder = (9) = 14 point improvement
- Synovitis = (9) = 26 point improvement
- Loose bodies = (6) = greatest improvement = 34 points
- AVN = (4)

Byrd & Jones, "Prospective Analysis of Hip Arthroscopy with 2-Year Follow-up," *Arthroscopy*, Vol. 16, No. 6, 2000, 578-587.

- Poor results of arthroscopy as a palliative procedure
- Cont to question role of arthroscopy in staging
 - Perthes =(2)
 - Synovial Chondromatosis = 1
 - Ligamentum Teres damage = 1

Byrd & Jones, "Prospective Analysis of Hip Arthroscopy with 2-Year Follow-up," *Arthroscopy*, Vol. 16, No. 6, 2000, 578-587.

- No significant difference in results based on CE angle (only one patient with dysplasia, i.e. CE angle < 20), work comp, or pending litigation. However, anecdotally work comp and litigation seemed to do better.

Onset & duration of symptoms

- patients with acute or traumatic onset of symptoms with greater improvement than those with insidious onset of symptoms
- Longer duration of symptoms especially in male counterparts correlated with less successful outcomes

Complications

- LFCN neuropraxia – resolved
- Myositis of anterior quad following removal of loose bodies for synovial chondromatosis-responded to exc.

Conclusion:

- Hip arthroscopy can be performed for a variety of conditions (except end-stage AVN) with reasonable expectations of success.

Dorfmann and Boyer, "Arthroscopy of the Hip: 12 Years of Experience," *Arthroscopy*, Vol. 15, No. 1, 1999, 67-72.

- Review of 413 patients over 12 years
- 68% for diagnostic purposes
- 32% for operative purposes
- Arthroscopy performed with and without traction

Dorfmann and Boyer, "Arthroscopy of the Hip: 12 Years of Experience," *Arthroscopy*, Vol. 15, No. 1, 1999, 67-72.

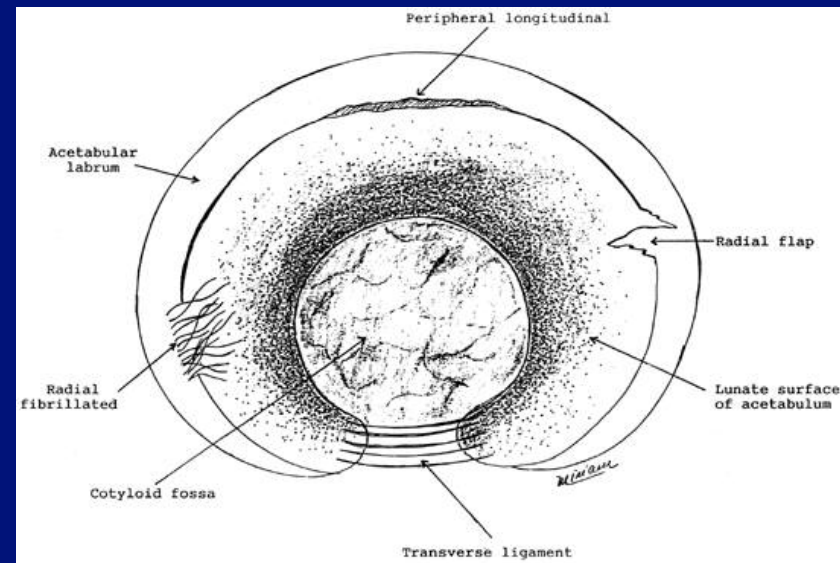
- Labral lesions commonly overestimated at arthrography. Only 18 cases of 413 confirmed arthroscopically (4.4%)
- 93 of 103 arthroscopies for chondromatosis were therapeutic (90.3%)
- 55 normal hip scopes 13.3% – too high

Dorfmann and Boyer, "Arthroscopy of the Hip: 12 Years of Experience," *Arthroscopy*, Vol. 15, No. 1, 1999, 67-72.

- Mixed traction technique
- Indications:
 - Undiagnosed hip pain despite complete work-up
 - Undiagnosed catching or locking of the hip
- Diagnostic arthroscopy especially beneficial for biopsy specimens in inflammatory synovitis, etc.
- Removal of loose bodies is main therapeutic indication

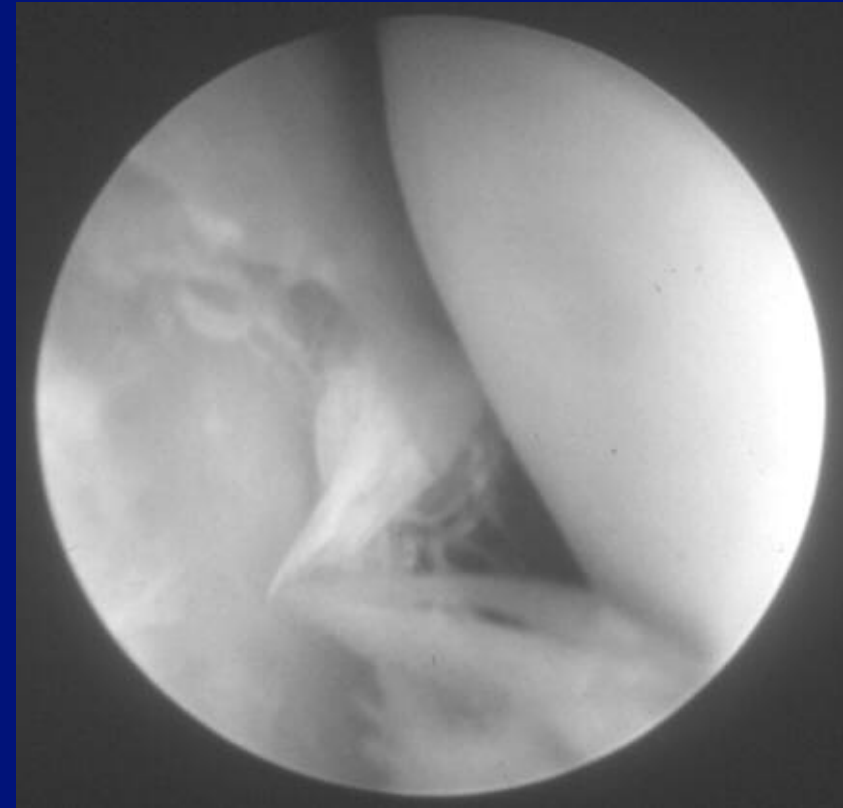
Lage, Patel, and Villar, “The Acetabular Labral Tear: An Arthroscopic Classification,” Arthroscopy, Vol. 12, No. 3, 1996, 269-272.

- 267 hip scopes
- 37 labral tears
- 4 Etiologies:
 - Traumatic (7) – clear history with no degen cartilage changes
 - Degenerative (18) – if degenerative changes present in cartilage or labrum
 - Idiopathic (10)
 - Congenital (2) - two subluxing labra which were functionally abnormal



Lage, Patel, and Villar, “The Acetabular Labral Tear: An Arthroscopic Classification,” Arthroscopy, Vol. 12, No. 3, 1996, 269-272.

- 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



Farjo, Glick, & Sampson, "Hip Arthroscopy for Acetabular Labral Tears," *Arthroscopy*, Vol 15, No. 2, 1999, 132-137.

- Attempt to define clinical presentation, diagnosis, and outcome of arthroscopic debridement of acetabular labral tears.
- Retrospective review of 28 labral tears with min. of one year of follow-up with subjective outcome analysis.

Farjo, Glick, & Sampson, "Hip Arthroscopy for Acetabular Labral Tears," *Arthroscopy*, Vol 15, No. 2, 1999, 132-137.

- Presenting symptoms
 - 36% recalled a specific event
 - 64% with mechanical symptoms
 - 57% described clicking
 - 18% described locking
 - 14% giving way

Farjo, Glick, & Sampson, "Hip Arthroscopy for Acetabular Labral Tears," *Arthroscopy*, Vol 15, No. 2, 1999, 132-137.

- Physical exam - no specific reproducible pattern
 - provocative positioning ranged from flex/IR to ext/ER
 - provocative position did not correlate with location of labral tear

Farjo, Glick, & Sampson, "Hip Arthroscopy for Acetabular Labral Tears," *Arthroscopy*, Vol 15, No. 2, 1999, 132-137.

- Radiography
 - 50% DJD
 - MRI pos. in 5 of 21
 - Arthrography pos. in 1 of 8

Farjo, Glick, & Sampson, "Hip Arthroscopy for Acetabular Labral Tears," *Arthroscopy*, Vol 15, No. 2, 1999, 132-137.

- Arthroscopic Findings
 - 17 tears of anterior labrum
 - 7 tears of posterior labrum
 - 4 tears of superior labrum

Farjo, Glick, & Sampson, "Hip Arthroscopy for Acetabular Labral Tears," *Arthroscopy*, Vol 15, No. 2, 1999, 132-137.

- Subjective outcome scores:
 - 13 good results
 - 15 poor results
 - correlation present between radiographic presence of arthritis, femoral chondromalacia, acetabular chondromalacia, and poor result
 - 10 of 14 (71%) with good result in patients without radiographic evidence of arthritis

Farjo, Glick, & Sampson, "Hip Arthroscopy for Acetabular Labral Tears," *Arthroscopy*, Vol 15, No. 2, 1999, 132-137.

- Complications

- 2 Sciatic nerve palsies
- 1 Pudendal nerve palsy
- All resolved spontaneously without sequelae

Farjo, Glick, & Sampson, "Hip Arthroscopy for Acetabular Labral Tears," *Arthroscopy*, Vol 15, No. 2, 1999, 132-137.

- Conclusion

- Good result of labral tear debridement if no evidence of arthritis
- Poor result of debridement if radiographic evidence of arthritis or arthroscopic evidence of chondromalacia
- Questions the efficacy of Hip arthroscopy for DJD
- Difficult to diagnose labral pathology without arthroscopy.

Byrd, “Avoiding the Labrum in Hip Arthroscopy,”
Arthroscopy, Vol. 16, No. 7, 2000, 770-773.

- Iatrogenic intra-articular damage to the joint is likely the most common complication associated with hip arthroscopy.
- Use of cannulated instrumentation
- Anterolateral portal established first “blind” under fluoro

Byrd, “Avoiding the Labrum in Hip Arthroscopy,”
Arthroscopy, Vol. 16, No. 7, 2000, 770-773.

- Reposition the needle after breaking the negative intra-articular vacuum if any concern about position of needle and guide wire
- Use 70 degree arthroscope for direct visualization of anterior and posterolateral portals
- After making accessory portals look at anterolateral portal to ensure no labral damage.

Thank

You