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 tubersosity
AAOS OKU Sports Med 2
“Groin Pain in the Athlete”

- Snapping Hip
  - Iliopsoas gliding over iliopectineal eminence or femoral head
  - IT band over greater trochanter
  - 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 repetative 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
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
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

- Outcome study of heterogeneous 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.

- 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)

- 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)

- 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

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.

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

- 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

- 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

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

- 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

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

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

- 17 tears of anterior labrum
- 7 tears of posterior labrum
- 4 tears of superior labrum
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
Complications

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

- 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.
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

- 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