Progressing the Athlete from the Clinic to Competition following Hip Arthroscopy

Randi Moak, DPT, SCS

Statistics
- More than 30,000 hip arthroscopies were performed in 2008.
- An estimated increase by 15% over the next 5 years will result in approximately 70,000 by 2013.

Objectives
- Understand human anatomy and biomechanics of the hip.
- Identify signs and symptoms of athletes with intra-articular hip pathologies.
- Have knowledge of evidenced based sport specific rehabilitation following hip arthroscopy.

Hip Complex
- The hip complex is comprised of the coxafermal joint and pelvic girdle.
- It provides stability and mobility to the entire human mechanism during functional activities.
- Dysfunctions in the hip complex can lead to mechanical alterations and clinical consequences in the kinetic chains of the spine and entire lower extremity.

Coxafemoral joint
- The epicenter of the hip complex.
- A convex joint surface articulating on a concave joint surface counterpart (acetabulum), whose surface area is augmented by a cartilaginous labral ring.
- The acetabulum surrounds the femoral head and limits pure translational joint specific movements at that joint.

Labrum
- Triangular fibrocartilaginous structure
- Transverse acetabular ligament \(\rightarrow\) bony rim of acetabulum
- Functions
  - Increases acetabular volume by 1/3
  - Increases intra-articular pressure to increase inherent stability of joint
  - Evenly distributes forces within joint
  - Outer 1/3 margins are fairly well vascularized.
  - (Griffiths and Khanduja, 2011)

Extra-articular vs. Intra-articular

Extra-articular hip injuries (overuse-compensatory)
- Inflammation
- Tendonitis
- Bursitis

Intra-articular
- Dysplasia
- Slipped capital femoral epiphysis
- Legg-calve perthes
Femoral Acetabular Impingement
- Abnormal abutment of proximal femur against rim of acetabulum causing limitation of motion resulting in early hip dysfunction, chondro-labral injuries, and ultimately hip arthritis.

(Frenchton and Schenker, 2006)

CAM VS PINCER LESION
- CAM-abnormally shaped femoral head contacts normal acetabulum, during flexion and IR
- CAM- more common in males (Reichenbach et. al)
- Allen et al stated 77.8% of individuals in his study had bilateral cam-type impingement
- PINCER LESION-normally shaped femoral head contacting deep or retroverted acetabulum

Labral tear
- Trauma (hip dislocations)
- Femoral acetabular impingement
- Capsular laxity/hip hypermobility
- Dysplasia and degeneration
- 74.1% of athletes no specific event (repetitive micro trauma)
- Isolated labral tears occur more often in younger population (Groh and Herrera 2009)
- 94% of labral tears anterior (Mintz et al.)
- Anterior tears are a possible result of the anterior orientation of both the acetabulum and femoral head. The femoral head has the least bony constraint anterior and relies instead on the labrum, joint capsule, and ligaments for stability (Groh and Herrera, 2009).

Chondral lesion
- McCarty et al. stated that 73% of patients with fraying or tearing of labrum had chondral damage in the same region.

Evaluation of Hip
- Subjective
  - Detailed history, onset of symptoms, level of athletic participation
- Objective
  - Observation, palpation, posture, gait analysis, ROM, flexibility, strength, and special test
  - Referred pain patterns (Arnold et al.)
    - Groin (73%)  
    - Lateral peritrochanteric (44%)  
    - Buttock (12%)  
    - Anterior thigh (8%)

Special Test
- Rule out Lumbar Spine
- Rule out extra-articular pathologies
- FABER
- Flexion-internal rotation-adduction impingement test

**Athletic presentation**
- Decreased ROM/Flexibility
- + Flexion-adduction-internal rotation impingement
- Pain with running, twisting, cutting, popping/clicking
- Groin pain, anterior thigh pain, or buttock pain
- Muscle Imbalance
  - Predisposing factors include tightness of hip flexors and erector spinae combined with weak gluteal and abdominal musculature characteristic of lower cross syndrome (Janda, 1996).

**Diagnostic test**
- Diagnostic hip injections
- X-RAY
- MRI-66% sensitivity, 79% specificity
- CT
- MRA- 87% sensitivity, 64% specificity
- Arthroscopy- gold standard
- Smith et al. (2011) meta-analysis suggest that based on current evidence MRA appears to be superior to conventional MRI for detecting an acetabular labral tear in adults.

**Arthroscopy**
- Burnett et al. stated that due to the delays in diagnosis, inaccurate diagnoses, and ineffective treatment; the average time form initial onset of symptoms to the definitive diagnosis was 21 months.
- Goal of arthroscopy is to reduce degeneration and pain by eliminating the unstable labral flap causing discomfort.
- Post operative precautions
  - Avoid excessive hip flexion(sitting soft surfaces)
  - Avoid pivoting on operative lower extremity
  - Avoid walking for exercise
  - Decrease stress placed on hip flexors (psoas inhibition)
  - % WB based on surgical procedure
  - CPM physician preference
- Labral debridement, osteochondroplasty foot flat WB 2 weeks
- Micro fracture, gluteus medius repair-foot flat WB/30lbs 4-6 weeks (Edelstein et al. 2012)

**Avoid Hip Flexion**
- Following hip arthroscopy the psoas muscle is often inhibited. The tensor fascia lata and rectus femoris are superficial hip flexors which tend to compensate for the lack of function of the psoas and become overused and irritated during the post operative course (Edelstein et al. 2012).

**Components of Athletic Rehabilitation**
- FOCUS ON POWER, SPEED, AND AGILITY
- Seven basic principles
- Allow soft tissue healing and control swelling
- Limit muscular atrophy
- Early ROM and WB restrictions
- Initiation of muscle activity and neuromuscular control
- LE strengthening and proprioceptive training
- Cardiovascular training
- Sport Specific Training

(Stalzer, Wahoff, and Scanlan, 2006)

Stage I  (initial -4weeks)
- Control swelling
- Early ROM
- Upright Stationary Bike (limit excessive flexion)
- Isometrics (gluts, quads, HS, transverse abdominals)
- NO Straight Leg Raise (avoid hip flexor irritation)
- Hip abduction, adduction, external rotation strengthening
- Hip hikes
- Prone hip IR/ER
- Pool walking

Stage II (4-8 weeks)
- Regain ROM
- Normalized gait (wean of crutches)
- Increase LE and core strength
- SLS proprioception
- Progression of bridging from Bilateral to Single leg
- Biking
- Lateral slides with resistance
- Aquatic therapy (LE and core strengthening)
- Pool running (chest deep water)

Stage III (8-12weeks)
- Advanced strengthening and neuromuscular control
- Progress core strengthening and stabilization
- Lunge progression
- Side to side agilities
- Forward/backward running with sport cord
- Initiate running intervals and agility drills
- Water bounding and agilities

Stage 4 (12-16weeks)
- Sport Specific Training
  ▪ Plyometrics
  ▪ Cutting, jumping, pivoting
- ROM/Flexibility
- 12 weeks progress with return to running, skating, cycling
- Strength
- Power
- Agility

**Osteoplasty Precautions**
- Flat-foot WB or 20lbs for 4 weeks
- Limit impact activities for first 8 weeks due to increased risk of femoral neck fracture.
- Phase I- Day1- 6 weeks
- Phase II- 6- 12 weeks
- Phase III- 12-20 weeks
- Phase IV- 20-28 weeks

**Micro fracture**
- Flat-foot WB or 20lbs for 4-6 weeks
- Avoid compressive and sheer forces at site of micro fracture.
- Impact activities should be added cautiously
- Phase I- Day 1-8weeks
- Phase II- 8-12 weeks
- Phase III- 12-20weeks
- Phase IV- 20-28 weeks

**Return to Sport Statistics**
- Nho et al. (2011) reported that at one year following hip arthroscopy for femoral acetabular impingement, 79% of athletes were able to return to play with over 90% at the same level of competition.
- Average of 9.4 months after surgery.
  - Professional athletes 83%
  - Collegiate level 59%
  - High school 90%

**Estimated RTS following Labral Repair**
- Average for professional athletes
  - Golfers 6 weeks
  - Hockey players and skaters 8weeks
  - Baseball and soccer 12weeks
  (Groh and Herrera, 2009)

**Conclusion**
- Healing and recovery times are based on involved osseous or soft tissue structures.
- Although athletes tend to recover faster than the general population, all patients are most at risk for setbacks when transitioning to a higher phase of rehabilitation(Edelstein et al., 2012).

**References**


