Labral Injuries of the Hip: Indications and Considerations for Rehab

Kristen Alford, PT
OrthoCarolina Sports Physical Therapy

Objectives

• Understand the factors that may increase risk for an acetabular labral tear
• Become familiar with clinical findings that may indicate a labral tear
• Discuss conservative treatment measures for labral tears
• Discuss post-operative precautions and treatments

The hip region is involved in 5%-9% of injuries in high school athletes (Lewis and Sahrmann).

Studies have shown that 22% of athletes with groin pain and 55% of patients with mechanical hip pain of unknown etiology were eventually found to have a labral tear (Lewis and Sahrmann).

In one study of athletes, 60% were treated for 7 months before it was realized that the hip joint may be the source of the symptoms (Byrd).
Who is at risk

- Acetabular labral tears occur more often in Females (Lewis and Sahrmann)
- Structural risk factors
  - Hip dysplasia
  - Decreased Femoral Neck Anteversion (Cibulka)
  - Bony abnormalities resulting in Femoroacetabular impingement (FAI)
- Those who participate in activities that cause repetitive stress to the joint
- Up to 74.1% of labral tears are not associated with any known specific event or cause (Lewis and Sahrmann)

Mechanism of Injury

- Direct trauma
- Repetitive stress
  - Sports with repetitive external rotation or hyperextension of the hip
  - Repetitive impingement due to bony abnormalities (FAI)

Why does it matter?

- Often undiagnosed for several months
- Acetabular labral tears are associated with OA of the hip
  - Byrd reports that by the time of arthroscopic intervention for FAI, many athletes already have significant grade III and IV articular lesions
  - Lewis and Sahrmann report a study that found chondral damage in 73% of patients with labral tears or fraying
- Can result in muscle imbalances, compensatory strategies and decreased neuromuscular control
PT Evaluation

• Thorough history and questioning about hip pain
• Physical evaluation of lower quarter impairments and functional abilities
• Generally not just one specific finding but multiple findings together that may indicate an acetabular labral tear

PT Evaluation - Subjective History

• In greater than 90% of patients, pain reported in anterior hip or groin (Lewis and Sahrmann)
  - Some evidence of buttock pain with posterior labral tear
  - “C sign” describing deep, interior hip pain (Byrd)
  - Intermittent sharp stabbing pain
  - Clicking, locking, catching (Lewis and Sahrmann)
  - Difficulty walking after sitting
  - Weakness/ difficulty getting in/ out of bed (rotational motion with hip flexion)
• Aggravating factors:
  - Turning, twisting, pivoting, lateral movements (pain or clicking)
  - Extension of the flexed hip against resistance such as rising from a squatted or sitting position (pain)
  - Running (residual pain)
  - Deep squat (pain)
• Average duration of symptoms 2 years (Lewis and Sahrmann)

C Sign
**PT Evaluation- Physical Exam**

- **Alignment and posture**
  - Hip or knee hyperextension
  - Genu valgum
  - Pes planus
  - Look for evidence of core weakness

- **Gait**
  - Look for evidence of knee and hip hyperextension
  - Check for Trendelenburg
  - Abnormal rotations of hip
  - May also assess running form if pain occurs with running

- **Palpation**

- **ROM**
  - Hip rotation in prone and sitting
  - Compare side to side and same side ER to IR
  - Hip motion generally consistent side to side within 10 degrees (Cibulka)
  - Abnormal considered 15 degrees difference or more (Cibulka)
  - ROM difference with medi and lateral rotation same side should be less than 30 degrees (Cibulka)
  - Equal PROM/AROM particularly with hip flexion and rotations

**Flexibility**
- Hamstring, rotators, rectus femoris, illopoas, IT band

**Strength and Neuromuscular Control**
- Assess strength of Core and Lower extremity
- Look for evidence of muscle imbalance
  - Examples:
    - Compare glute vs hamstring activation and strength with prone hip extension
    - Assess overuse of hip flexors due to decreased core stability

**Functional Assessments**
- Can give functional clues to help identify limitations of strength, range of motion and neuromuscular control
  - Examples:
    - Mini squat
    - Functional squat
    - SLS
    - Forward bend
    - Step downs

**Bridge with leg extension test**

![Image of a person performing a bridge exercise with leg extension test]
Functional squat

Step downs

PT Evaluation• Physical Exam

Special tests and Provocative tests:
- May not reproduce exact symptoms as you will not be able to create the same level of force generated by the athlete during activities
- Log roll test
  - Not sensitive but is specific for hip joint pathology independent of it’s cause (Byrd)
  - Fair inter-rater reliability (Martin)
- Impingement test
  - Forced flexion, abduction, and internal rotation
  - Sensitive but not necessarily specific for impingement (Byrd)
  - May also be uncomfortable on uninvolved side comparison is helpful
  - Look for it if it re-creates the pain that the patient complains of with activity
  - Poor inter-rater reliability (Martin)
- FABER
  - Flexion-abduction-external rotation
  - Sensitive (88%) but not specific (Lewis and Sahrmann)
  - Fair inter-rater reliability (Martin)
- Other provocative tests described by Lewis and Sahrmann
  - Hip extension
  - Hip extension with internal rotation
  - Hip extension with internal rotation
  - Hip flexion with IR and abduction
  - Hip abduction with ER
  - Limited info on sensitivity and specificity of these tests
**PT Evaluation**

- Differential diagnosis
  - Lumbar spine
  - Athletic pubalgia (sports hernia)
    - Often will have localized tenderness to palpation along the pubic ramus
    - Resisted sit ups or hip adduction may exacerbate
    - Should not be aggravated by passive hip flexion with extremes of rotation
  - Snapping psoas (present in 10% of population asymptomatically, may not be the problem)
  - Snapping of the ITB
  - Stress Fracture
  - Hip flexor strain

**Putting it all together**

- Lewis and Sahrmann highlight a combination of factors that they feel indicates a labral tear
  - Long duration of anterior hip and groin pain
  - Clicking
  - Positive impingement test
  - Pain with active SLR
  - Min to no restriction with ROM

**The Role of PT in Conservative Management**

- Refer when appropriate
- Benefit of conservative treatment (?)
  - Few articles on treatment of labral tears
  - Benefit of correcting mm imbalances and other impairments
  - Patient education on body mechanics and activity modification
  - Manual techniques
Correcting Muscle Imbalances

Voight describes 3 mechanisms of Neuromuscular compromise
- Arthokinetic Inhibition:
  - When a muscle is inhibited by joint dysfunction
    - overuse leads to shortening and tightening of postural muscles
    - Disuse leads to a weakening and inhibition of phasic muscles
- Synergistic Dominance:
  - When synergists, stabilizers and neutralizers overcome a weak or inhibited prime mover
- Reciprocal Inhibition:
  - When a tight muscle decreases neural drive to its functional antagonist
    - Leads to compensation and predictable injury patterns

Activity Modification

- Educate the athlete to avoid aggravating and/or painful positions
- Squats should be avoided or performed with hip flexion limited to 45 degrees (Byrd)
- Avoid sitting with knees lower than hips or sitting on edge of seat with pressure on femur
- Avoid prolonged positions of rotation at the hip
  - Sitting with legs crossed
  - Sleeping positions
- Avoid walking with excessive hip hyperextension and any excessive hip extension in prone

Manual Techniques

- Pain reduction
- Posterior tightness
- May not be effective in a patient with FAI because motion is limited by the bony architecture (Byrd)
Post op Rehab Guidelines

• Limited evidence for rehab guidelines (Voight)
• Important to communicate with surgeon
  – Prognosis may not be as good with patients with hip dysplasia or chondral lesions
• Post op rehab and progression will be dependent on the procedure that was done, and the extent of damage in the joint
• Progression is patient dependent and focus should be on quality of movement during each phase as compensatory strategies are likely
• Minimal expectations of return to sport
  – Arthroscopic labral debridement: 8-12 weeks
  – Surgical correction of FAI: 4 to 6 months

Goals of Post Op Rehab

• Decrease pain and inflammation
• Normalize gait
• Restore normal ROM and strength
• Restore function
• Return to prior level of activity

Post op Rehab Progression

• Voight offers General guidelines for post op rehab Progression
  – Phase 1- mobility and initial exercise
  – Phase 2- intermediate exercise and stabilization
  – Phase 3- advanced exercise ad neuromuscular control
  – Phase 4- return to activity
Phase 1 - Initial Exercise

- Phase 1 Goals:
  - decrease/eliminate pain
  - protect repaired tissue
  - progress toward normalized gait with or without assistive device
  - restore pain-free ROM
  - prevent muscle inhibition

Pain Control and Protection

- Patient Education is Key
  - Educate patient in use of ice and medications as needed and prescribed by MD to help with inflammation and pain control.
  - Educate patient on pathology, goals, time frame, and precautions
  - Advise patient to limit rotation and torsion, hip flexor activation, excessive extension, excessive walking
    - Avoid SLR and sit ups
    - Advise patient to assist leg during transfers
  - Instruct patient in proper body mechanics
  - Instruct patient in weight-bearing precautions and proper gait with assistive device
- Limit stress to anterior soft tissues to prevent irritation

Manual Techniques for Pain Control

- Manual techniques can decrease compressive forces across the articular surfaces and help with pain control
  - Small accessory oscillations for pain and capsular mobility
  - Posterior and Inferior glides
  - Long axis traction or distraction
    - Useful when hip movements are painful
    - Oscillations
    - Can be accompanied by rolling or sliding motion
    - Can be performed in various degrees of hip flexion
Weight Bearing and Gait Progression

• Amount of WB can vary depending on surgical procedure
  - Debridement generally WBAT
  - Labral repair generally PWB for 6 weeks
  - Microfracture generally PWB for 2 months
  - Reshaping of Femoral head/ neck generally WBAT with assistive device for 4 weeks to protect against flexion

• Focus on quality of gait
  - Encourage proper use of assistive device
  - Do not allow pt to progress off assistive device until they can do so with normalized gait pattern
  - Hip hyperextension with gait can increase demands on the anterior hip joint (Lewis and Sahrmann)
  - Watch for Trendelenburg gait pattern

Restore ROM

• Early ROM limits likelihood for adhesions
  - Emphasis on early gentle passive IR and hip flexion to limit scarring between the hip joint capsule and acetabular labrum
    • Limit hip flexion to 90 (particularly for repairs)
    • Avoid ER with labral repair for 6 weeks
  - Push ROM only to tolerance
  - Stretch posterior capsule
  - Quadruped rocking
  - Stationary cycling with no resistance
    • Avoid recumbent bike and flexed forward position on upright bike to minimize hip flexion

Phase 1 ROM Activities
Prevent Muscle Inhibition

- Prevent muscle inhibition
  - Progress per patient's tolerance
  - Focus on quality, no quantity
  - Isometrics: glutes, quad, hamstring, adductor, abductor, lower abdominals
  - Clamshells
  - Bridges
  - Aquatic exercise
  - Core stab

Phase 1 Exercises

- consider what frequency of PT is needed

Phase 1 Other Considerations

- To progress to phase 2:
  - ROM approaching WNL
  - Normalized gait
  - Min to no pain
Phase 2 - Intermediate Exercise

- Phase 2 goals
  - Protect integrity of tissue
  - Normal ROM
  - Progress with functional activities
  - Progress to normalized gait without assistive device
  - Progress strength and endurance and proprioception
  - Progress core stabilization

Phase 2 Considerations

- Generally starts around 4-6 weeks
- Continue ROM activities until full, pain free ROM
- Progress WB and gait
- Progress PREs
- Initiate proprioception exercises
- Limit compensation, substitution and muscle imbalances
- Continue mobilizations if needed

Phase 2 Exercise Examples

- Elliptical, Stairmaster, treadmill walking
- Add resistance to previous exercises
- SL balance progression
- Leg press
- Mini squats- progress to uneven surface as tolerated
- Dynamic gait progression (sidestepping, stepping over hurdles-forward and side, sport cord walking)
- Quadruped activities- progress from 3 point to 2 point
- Progress hamstring strengthening (bridges and hamstring curls on physioball, stool scoots)
- Planks- progress as tolerated
- Hip hikes
- Resisted hip rotation in WB
- Single leg squat with UE assist
- Single leg reach to knee height
• To progress to phase 3
  – Good core strength
  – Hip strength approaching at least 70% of uninvolved side
  – Approaching full ROM
  – Good flexibility of rectus and iliopsoas
  – Demonstrates good single leg balance and proprioception (stable pelvis in SLS)
  – Good form with phase II activities, no compensation, good control

Phase 3- Advanced Exercises

• Goals
  – Restore muscle strength and endurance
  – Optimize neuromuscular control, balance and proprioception
  – Restore full ROM

• Usually begins around post op week 7 or 8

Phase 3 Considerations

• Progress proprioceptive retraining
• Progress dynamic stabilization
• Progression from bilateral to single limb activities
• Add in high speed activities
• Running
• Jumping
• Agility
Phase 3 Exercise Examples

- Progress eccentric lowering with step ups
- Theraband walking patterns (start band at knee height and progress to ankle height)
- Bridge and plank progressions
- Full squats- progress to resistance
- Lunge progression
- Progress difficulty with side steps over hurdles (ball toss, sports cord)
- Single leg reach progression
- Single leg squat progression

To progress to phase IV

- Single leg mini squat with a level pelvis
- Able to perform phase III activities without pain
- Hip strength approaching at least 70% of uninvolved side
- Good form with phase III activities, no compensation, good control
- MD clearance

Phase IV- Sport Specific Training

- Goals
  - Return to prior level of function
  - Return to sport
Phase IV Activity Examples

• From around week 8-9
  – Continue to progress previous exercises through use of unstable surfaces, varying speeds
  – Initiate agility drills
  – Initiate quick feet step ups
  – Initiate shuttle jumps
  – Progress theraband walking patterns
  – Pool running (start chest deep)

Phase IV Activity Examples

• Week 12 (If cleared by MD)
  – Initiate treadmill running progression
  – Begin swimming laps in the pool (flutter kick only)
  – Initiate sports specific drills
  – Progress return to traditional weight training activities

Return to Sport Criteria

• Full Range of Motion
• Hip strength equal to uninvolved side
• Able to perform single leg pick up with stable pelvis
• Able to perform sport-specific drills at full speed without pain
• MD clearance
Variations

- **Labral repair**
  - Slower WB progression
  - Limit hip flexion and ER initially
  - Slower exercise progression
  - May be increased time back to sport depending on severity

- **Microfracture**
  - Very slow WB progression
  - May be able to do quite a bit at home for phase 1 if given a good program
  - Slower to progress with WB activities
  - Longer time before return to sport 12 to 16 weeks

- **Femoroplasty**
  - Watch for torsion with exercise progression
  - Generally WBAT but may continue to use 2 crutches for 4 weeks to prevent torsion
  - Fracture of femoral neck is a possible serious complication (though unlikely)
  - Full bony remodeling takes at least 3 months
  - Return to sport 4 to 6 months

References


