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HIP ARTHROSCOPY REHABILITATION

Physical Therapy after arthroscopic hip surgery for

Femoral **A**cetabular **I**mpingement (FAI)

SURGICAL DESCRIPTION

There are 3 types of pathologies involved with femoroacetabular impingement. Patients can have a cam type impingement, a pincer type, or a combined lesion (both cam and pincer). Damage to the labrum can occur with both types of impingement. The labrum is a cartilaginous structure that extends from the acetabulum. The function of it, although not completely known, is to provide a suction seal between the ball and the socket joint, as well as to provide lubrication for the femoral head as it articulates with the acetabulum. Impingement is the most common reason for labral tears. The surgical procedures to correct these pathologies are different, but may occur together, depending on the pathology involved.

CAM IMPINGEMENT

In cam type impingement there is an abnormal build up of bone at the femoral head and neck junction. The femoral head has an appearance that is out of round and as the hip comes up into flexion this abnormal bone abuts the anterior and superior acetabulum and causes delamination of the articular cartilage and often fraying of the labrum. In order to prevent further damage to the cartilage and labrum,

the femoral head and neck junction is re-contoured to create a more normal head and neck relationship. This is accomplished by doing a proximal femoral osteochondroplasty (femoroplasty). A wide capsulotomy is performed to gain exposure to the lesion. The lesion is carefully mapped via visual inspection and x-ray assistance and the abnormal bone is removed with a motorized burr. Following the removal of the abnormal bone, the hip is taken through a full range of motion to insure that no further impingement is occurring. We look at the hip again with x-ray assistance to insure that an adequate resection has taken place and that we have restored a more normal relationship between the femoral head and femoral neck. Occasionally some of this bone dust is left behind, so we take precautions to prevent extra bone from forming (which is called heterotopic ossification) by asking our patients to take an anti-inflammatory medication on a regular basis for three weeks. If they are unable to tolerate the medication, we will have them get a very low single dose of radiation therapy.

PINCER IMPINGEMENT

Pincer type lesions are created when acetabular rim over covers the femoral head. When the hip is flexed, the excessive rim of the acetabulum abuts the labrum against the femoral neck. Over time, this micro trauma leads to breakdown of the acetabular labrum. Labral tears that are associated with pincer type impingement are often seen as significant contusions to the labrum as the labrum gets crushed between the acetabulum and the femoral head. In cases like these, the labrum itself may not actually be torn away from the socket. We will just note significant hemorrhage within the labral tissue.

In order to correct this type of lesion, the acetabular rim must be trimmed back to eliminate the pincer lesion (acetabuloplasty or acetabular rim trim). Typically we are able to preserve the majority of the labrum. The labrum is elevated off of the acetabular rim to expose the pincer lesion. The excessive bone on the acetabulum is removed and the labrum is re-attached to the socket with suture anchors. By removing the offending lesion of bone and re-approximating the labrum to the acetabulum, we hope to

restore both the suction seal as well as the lubrication and stability properties of the labrum. In severe cases the labrum is damaged beyond repair and is simply removed.

PHILOSOPHY OF REHABILITATION

There is little difference between the rehab for femoroplasty, acetabuloplasty, and labral repairs/ refixation. Therefore, there is one protocol for all three. Be aware, though, that more caution with progression is warranted if more than one of the above procedures is performed**. A separate protocol is used when an iliopsoas release is performed.**

The main focus of the early stage of rehab is to restore motion and proper muscle recruitment of the core, gluts, and quads while protecting the integrity of the healing tissue. Caution is taken not to aggravate the anterior structures of the hip where most of the surgical work was performed. To promote normalized loading directly through the hip joint, focus on facilitating use of the posterior-lateral hip muscles (gluteus maximus, gluteus medius, gluteus minimus, and the deep hip rotators), and minimizing the use of the TFL, hip flexors, and ITB. Hip adductors are also notable for compensation when the gluteal muscles are weak and this can lead to pain and inflammation of the adductors. This may mean the patient needs to focus more on using the gluteal muscles. If they cannot do this functionally, it may be beneficial to slow down with progression until the gluteals are able to be properly recruited. Use of core muscles and gluteals to stabilize the pelvis is a must. Exercises done incorrectly or too aggressively can be just as harmful as not doing them at all. The pelvis should stay level in all planes during all standing exercises with proper core/gluteal support. Proper muscle recruitment and limited pain are essential for progression to the next phase.

Use of ice is important to minimize inflammation, as is education on gradual activity progression. If inflammation of the anterior hip muscles and adductors occurs, slow down the progression of strengthening/stability exercises. Focus instead on gentle stretches and soft tissue work to the affected

area, emphasizing proper muscle recruitment until symptoms have calmed down. Ultrasound can also be beneficial. Other associated dysfunctions include pelvic malalignment (ilial or sacral), vertebral rotational lesions, or irritation of quadratus lumborum leading to low back pain. These should be addressed as well.

Early passive circumduction is important in supine if the patient has someone available to do this. Gently grasp the LE around the ankle, applying gentle long axis traction, and circle the LE from the hip. Family members/caregivers should be instructed in proper technique if they are available to carry out this out at home. Patients may also find comfort in letting the surgical leg hang off of a stair and gently circling it. The circumduction will promote proper bony remodeling, unload the hip joint, and facilitate relaxation of the surrounding muscles.

The surgeon's staff will give the patient post op instructions including medication schedule (available on request), instructions on icing (20 min/hour with barrier such as a towel or pillow case between ice and skin), dressing change and showering (cover with plastic bag or Glad Press n Seal Wrap), and HEP (quad sets, glut sets, heel slides, and ankle pumps 3-4 times/day).

This should carry them through to the first post-operative visit. Patients generally return 3-4 days after surgery for the first post-operative physician visit and to initiate physical therapy. Patients usually have no weight bearing restrictions postoperatively and may or may not be using crutches at their initial evaluation. Patients will typically be seen 1-2x/week for the first month, depending on their level of function and availability to come to PT. After the first month, you may decrease frequency as patient progresses toward independence with follow up as appropriate to progress the rehab program.

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Hip Arthroscopy Rehabilitation

Procedure:

- Hip Arthroscopy/ labral debridement/ labral repair/ femoral osteochondroplasty/ psoas lengthening/ capsular repair/ capsular plication/ microfracture

General Guidelines

- Normalize gait pattern with brace and crutches
- Weight-bearing as per procedure performed
  - Any bony work (femoral osteochondroplasty): 20 lbs WB with crutches x 3wks
  - Soft tissue work only: WBAT w crutches
  - Microfracture: 20 lb WB x 6 wks
- Stress extension phase of gait (any procedure involving the psoas)
- Restore ROM without increasing pain
  - No active ER >20 degrees x 3 wks
- Diminish pain and inflammation
- Prevent muscular inhibition and promote proper recruitment of quads, glutes, and core
- Continuous Passive Motion machine
  - 4 hrs/day or 2 hrs/day if using stationary bike
- Protect the integrity of healing tissue

Rehabilitation Goals:

- Seen post-op day 1 or 2
- Seen 2x/wk for first 2 months
- Seen 1-2x/wk for third month

Precautions Following Hip Arthroscopy:

- Weight-bearing will be determined by procedure
- Hip flexor tendonitis
- Trochanteric bursitis
- Synovitis
- Lateral fatigue syndrome
- Manage scarring around portal sites
- Increase ROM focusing on rotation and flexion

Phase I
(Post-operative Day 1/2 – 3 Weeks)

Clinical Goals

- Restore ROM without increasing pain
- Diminish pain and inflammation
- Prevent muscular inhibition and promote proper recruitment of quads, glutes, and core
- Normalize gait
- Protect the integrity of healing tissue

Criteria for Progression

- Minimal pain with phase 1 exercises
- Minimal range of motion limitations
- Normalized gait
- Proper muscle recruitment with all phase 1 exercises

Guidelines

Week 1:

- CPM 4-6 hrs/day
- No active ER >20 deg
- Standing march, hip ext, abd with WB on nonsurgical LE with UE support
- Gentle standing hip flexor stretch (lunge or foot on chair), POE, prone press up, prone knee flexion to stretch ant hip structures
- Sustained stretching for psoas with cryotherapy (2 pillows under hips)
- Glut/hamstring/abduction isometrics if unable to properly recruit muscles isotonically
    - NO FLEXION
- Heel slides AAROM to AROM. No SLR in sitting or supine
- Low abdominal isometrics/proper isolated recruitment of core
- Prone glut max strengthening (isometrics, to foot push, to initiation of lift with proper core stability
- Weight shifting to emphasize proper recruitment of post lateral hip muscles in WB
- Standing heel raises with progressive WB onto the involved LE (focus on recruitment of quad and gluts with WB over first and second toes)
- Knee extension against gravity
- Standard stationary bike w/out resistance (up to 5-15 minutes IF pain free)
- Circumduction in supine passively with assist or standing pendulum hangs off of stair. (Should be continued through week 8)
- Gait training PWB w bilateral crutches

Week 2:

- Transition from 2 to 1 to no crutches as patient can do so with proper core/glut activation, no limp and no increase in pain.
- Supine marching with good core control and no shift in pelvis. No SLR
- Progress abduction isometrics to sidelying clam with hip in neutral (vs flexion) using glut med vs TFL/ITB

- Standing march, hip ext, abd with WB on surgical leg if able to do with proper glut support.
- Single leg balance when able to do so with good glut support/level pelvis
- Progress glut strengthening (prone glut raise, superman, double leg bridge) with good core stability
- B LE ¼ - ½ squats
- Standard stationary bike w/out resistance (up to 5-15 minutes IF pain free)
- Stiffness dominant hip mobs (up to grade II), and soft tissue mob to any affected areas
- Continue stationary bike w/o resistance up to 10 minutes max IF painfree

Week 3:

- Wean off crutches (2 → 1 → 0)
- Stationary bike w/minimal resistance- 5min increase daily
- Hip flexion, IR, ER in pain free motion. No supine SLR
- Double leg bridge to heel lift to marches to single leg bridge
- Standing or ½ kneel hip flexor stretch, gentle adductor, piriformis, and glut stretches (avoid flex/add/IR)as tolerated
- Stiffness dominant hip mobilizations up to grade III, continue soft tissue mob as needed
- Closed chain quad/glut strengthening (1/4 squat to step up with proper core/glut support
- Quadruped 4pt à 2pt support
- Stool rotations (stand next to rolling stool with knee of surgical leg on the stool, rotate hip internally and externally) or seated resisted rotation with tubing or band if weak.

Phase II
(3-6 Weeks)

Clinical Goals

- Restore full painfree ROM
- Initiate exercises for proprioception, neuromuscular control, and balance.
- Progressively increase muscle strength and endurance with progression to functional exercises maintaining core/pelvic stability.

Criteria for Progression

- Minimum pain with phase II exercises
- Single leg stance with level pelvis

Exercises

- Gradually increase resistance on stationary bike
- Increase resistance w/standing extension, flexion, abduction with WB on surgical LE
- Machine LE exercises: knee extension, knee flexion, leg press
- Single leg balance progression to unstable surface, arm or opposite leg movement with level pelvis
- Step downs

- Sidestepping w/resistance
- Standing resisted hip movement in all planes w/pulley or theratubing with WB on surgical leg
- Bilateral squats progression (wall squats, prisoner squats, wall slides-static or dynamic with or without swiss ball)
- Plank and side plank for core stability
- Initiate aqua therapy in low end of water (No treading water) (week 4)
- Swimming with pull-buoy for cardiovascular fitness if patient was previously a swimmer (week 4)
    - Be cautious of overuse of adductors, and discontinue swimming if they are flared up.
- Swimming without pull-buoy (week 6)

Phase III
(7-8 Weeks)

Clinical Goals

- Restoration of muscular endurance/strength
- Restoration of cardiovascular endurance
- Optimize neuromuscular control/balance/proprioception

Criteria for Progression

- Single leg mini-squat w/level pelvis and knee control
- Cardiovascular fitness equal to preinjury level
- Demonstration of initial agility drills with proper mechanics

Exercises

Weeks 7-8:

- Advance squat progression: Bosu squat, single leg squat progression; stable to unstable surface for proprioceptive progression
- Single leg balance activities w/external perturbation (ball toss/sport specific/simulated activities)(week 7)
- Initiate elliptical training (week 8)
- Single leg stability: ball bridges
- Lunge progression: single plane to tri-planar
- Theraband walking patterns: forward, side-stepping, carioca, monster walk, backward. Start with band at knee and progress to ankle
- Side steps over cups hurdles with ball toss
- Initiate agility drills: line hopping, ladder/grid stepping, side step over hurdles
- Aquajog

Phase IV
(9-12 Weeks)

Clinical Goals

- Sport specific training/progressions

Criteria for Progression/return to competition

- Full ROM
- Hip strength equal to uninvolved side, single leg dead lift w/level pelvis and good knee control (no dynamic valgus at knee or IR/adduction of hip)
- Ability to perform sport-specific drills at full speed without pain
- Completion of functional sports test
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Exercises

Weeks 9-11:

- All phase 3 exercises
- Single leg dead lift (bend forward at hip and pick up item from floor with level pelvis and good glut control). Add soft surface to progress
- Pool running
- Step drills
- Plyometrics, double to single leg jumps, bounding leaps all with focus on proper landing pattern for shock attenuation
- Continue theraband walking patterns
- Stair master (week 9)
- Treadmill walking program
- Light jogging for short intervals in prep for a running progression is sometimes allowed at week 10, but should only be done if patient is given clearance by Dr Camilleri

Phase V
(12-16 Weeks)

At week 12, the patient will most likely be cleared for sport specific training to include a running progression, sport specific drills, and progressive weight training.

Exercises

Weeks 12-16:

- Progressive LE and core strengthening
- Plyometrics
- Treadmill running program
- Sport specific agility drills

Criteria for Discharge

Re-Evaluate at 3, 6, 12 months

- Hip Sport Test (provided with script or contact Dr Camilleri's office for copy)
- Hip Outcome Score
- Pain free or at least a manageable level of discomfort
- MMT with 10 percent of uninvolved LE
- Biodex test of quadriceps and hamstrings peak torque within 15% of uninvolved side
- Single leg cross-over triple hop for distance:
    - Score of less than 85% are considered abnormal for male and female
- Step down test