Post Surgical Hip Rehabilitation

The Vail Approach

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Howard Head Sports Medicine
Objectives

1) Identify Arthroscopic Hip Procedures
2) Discuss Different Phases of Post operative Hip Rehabilitation
3) Explain the importance of Criterion based rehabilitation
4) Review clinical advise to ensure a successful recovery for the individual patient
Hip arthroscopic Procedures

- Femoral Acetabular Impingement
- Labral Repair
- Labral Reconstruction
- Microfracture procedure
Phase I: Protection and Range of Motion

Phase II: Stability and Gait

Phase III: Initial Strength and Muscular Endurance

Phase IV: Plyometrics & Return to Sport Training
Phase I: Protection and Mobility
Weeks 1-3 for non-microfracture, Weeks 1-7 for microfracture

Goals:

- Protect integrity of repaired tissues
- Diminish pain and inflammation
- Restore range of motion within restrictions
- Prevent muscular inhibition
- Education
Range of Motion Restrictions

Flexion/Internal Rotation/Adduction:
Limited by pain or pinching, no restriction
Abduction: 0-45 x 2 weeks
External Rotation: Limited to 0 deg x 17 – 21 dys
Extension: Limited to 0 deg x 21 days
Weight Bearing Restrictions

- **Non Microfracture**
  - 20# WB for 3 weeks, then 50% for 7 days, then wean gradually as appropriate until gait is normalized

- **Microfracture**
  - 20# WB for 7 weeks, then 50% for 7 days, then wean gradually as appropriate until gait is normalized
Protection of Repaired Tissue

- Avoid active hip flexion against gravity x 2 wks
- No sitting at 90 deg for 2 weeks
- Hip Brace and Anti–rotational system
  - Hip Brace worn for 21 days to prevent extension and ER
  - Anti-rotational system prevents ER, used for 17 – 21 days
Reduction of Swelling

- Lymphatic Drainage
- Early Initiation of non-resistance biking
  - Can be performed as early as 4 hours post surgery
  - 2x per day for 20 min, no resistance for 6 weeks
- CPM machine
  - 6+ hrs x day in position of slight abduction
- Game Ready
  - Compressive ice machine used 4-5x/day
Initial PROM

Log Roll, abduction, IR, circumduction CW & CCW, sidelying Flexion

- Facilitate stress free mobility to ensure
  - Decreased risk of scar formation
  - Regain full PROM
  - Inhibit previous muscle guarding patterns
- Avoid increasing joint pressure through
  - Abiding by end feel prior to pain threshold
  - Proper limb support to decrease muscle guarding
Aqua Therapy: Day 3 Post-op

Deep Water Aqua Jogging
Standing Abduction
Mini Squats
### Phase I Exercise Progressions

<table>
<thead>
<tr>
<th>Exercises</th>
<th>Common Compensatory Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isometrics: (Glute, TA, Quad)</td>
<td>Inability to maintain an isolated contraction</td>
</tr>
<tr>
<td>AROM: (cat/camel, quadruped Rocking)</td>
<td>Can not disassociate between pelvic and hip motion</td>
</tr>
<tr>
<td>Slideboard Abduction</td>
<td>Can not isolate gluteus medius, overactivates with TFL &amp;/or Rectus Fem</td>
</tr>
<tr>
<td>Standing Abduction</td>
<td>Can not isolate gluteus medius, overactivates with TFL &amp;/or Rectus Fem</td>
</tr>
<tr>
<td>Quadruped Glute Extensions</td>
<td>Inability to stabilize pelvis&gt;anterior pelvic tilt, hamstrings initiate movement due to lack of glute max strength</td>
</tr>
<tr>
<td>Sidelying Glute Med/max Holds</td>
<td>Overactive TFL due to decreased Glute med endurance, hamstring domination</td>
</tr>
</tbody>
</table>
Phase I: Protection and Mobility

Weeks 1-3 for non-microfracture, 1-7 for microfracture

Criteria to advance to Phase II:

• Minimal complaints of pain
• Proper muscle firing patterns
• Minimal complaints of “pinching” <100 deg
• Full weight bearing is allowed
Phase II: Stability and Gait
Weeks 4-8 for Non Microfracture, Weeks 8-12 for Microfracture

Goals:

• Re-establish proper muscular stability
• Normalize gait
• Restore full range of motion
• Initiate functional exercises w/emphasis on core and pelvic stability, along with proprioception and balance
Anterior Muscular Stability

TRANSVERSE ABDOMINIS

ILIOPSOAS

Transversus Abdominis

The Rectus Abdominis

Internal Oblique

External Oblique
Lateral Hip Stability

DEEP EXTERNAL ROTATORS = 70%

SUPERIOR GLUTE MAX, ITB, TFL = 30%
GLUTEUS MAXIMUS

- Primary posterior stabilizer
- Initiation of Hip extension

Hamstrings/Quadratus Lumborum (QL)
- Secondary Hip Extensors

Neuromuscular Pattern For Hip Extension = GLUTES > Hamstrings > QL
## Quick Test Screen for Gait Progression

<table>
<thead>
<tr>
<th>Test</th>
<th>Procedure</th>
<th>Advancement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prone hip Extension Test</strong></td>
<td>Patient is able to maintain proper gluteus maximus initiation and maintain activation beyond 0 deg hip extension</td>
<td>Patient can progress to weight-shifting exercises</td>
</tr>
<tr>
<td><strong>Single Leg Balance Test</strong></td>
<td>Patient is able to maintain level pelvis without pelvic drop or rotation for 30seconds</td>
<td>Patient can progress to unassisted short distance indoor walking *</td>
</tr>
</tbody>
</table>

* Patient should demonstrate proper short distance walking without a limp prior to performing it independently.
Individualized Gait Progression

- Appropriate progression from 20# WB to 100% WB
- Progression of 5-10% increase with 2 crutches
- Soreness resolving within 24 hrs = normal
- Soreness lasting > 24 hrs, patient should return to previous level of gait progression
## Phase II: Glute Max Exercise Progression

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Common Compensation Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shuttle Squats</td>
<td>Over dominant Rectus, decreased Glute Max activation</td>
</tr>
<tr>
<td>Prone Short Arc Quads</td>
<td>Decreased pelvic stability, hamstring/QL compensation for Glute Max weakness</td>
</tr>
<tr>
<td>Weight Shifting (Forward &amp; Lateral)</td>
<td>Inability to activate Glute Med and Max with loading the joint</td>
</tr>
<tr>
<td>Double Leg Bridging</td>
<td>Initiation of hip extension with Hamstring, adductors and QL vs. Glute Max and Glute Med</td>
</tr>
<tr>
<td>Double Knee Bends</td>
<td>Pelvic Drop or rotation, Femoral Internal Rotation</td>
</tr>
</tbody>
</table>
Beginning Double Leg Strength

DOUBLE LEG BRIDGE

DOUBLE LEG KNEE BENDS
## Phase II Glute Med/Rotator Progression

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Common Compensation Pattern</th>
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<tr>
<td>Sidelying Neutral Clams</td>
<td>Inability to stabilize pelvis, Rectus Femoris takes over for decreased deep rotators</td>
</tr>
<tr>
<td>3 way gliders (lateral, 45 deg posterior, backwards)</td>
<td>Increased Lumbar lordosis secondary to decrease glute activation, TFL compensation vs. proper glute med activation</td>
</tr>
<tr>
<td>Sidelying Planks</td>
<td>Unable to maintain neutral pelvis, TFL &amp;/or Rectus femoris compensation for glute med</td>
</tr>
<tr>
<td>Seated IR and ER</td>
<td>Inability to maintain pelvic stability, overactivity of Rectus and Hamstrings</td>
</tr>
<tr>
<td>Stool Rotations</td>
<td>Inability to activate deep rotator muscles</td>
</tr>
</tbody>
</table>
Proper Gait Pattern
Phase II: Gait and Stability

Criteria to Advance to Phase III

- Gait is pain free and normalized
- Full ROM with mild stiffness into ER
- No joint inflammation, muscular irritation or pain
- Successful functional exercises with proper muscular control
Phase III: Initial Strength and Muscular Endurance

Weeks 8-12 for Non Microfracture, Weeks 12-16 for Microfracture

Goals:

1) Restore Full Range of Motion in all planes
2) Build Muscular Strength and Endurance
3) Minimize Strength deficits compared to normal side
## Phase III: Exercises

<table>
<thead>
<tr>
<th>Exercises</th>
<th>Common Compensatory Pattern</th>
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</thead>
<tbody>
<tr>
<td>Single Leg Bridges</td>
<td>Contralateral Pelvic drop secondary to core weakness or glute medius deficiency</td>
</tr>
<tr>
<td>Hip Hikers</td>
<td>Anterior pelvic tilt due to lack of core stability or TFL and adductor hyperactivity</td>
</tr>
<tr>
<td>Multiplanar Lunges</td>
<td>Contralateral Pelvic Drop &amp;/or rotation, femoral IR</td>
</tr>
<tr>
<td>Balance Squats</td>
<td>Contralateral Pelvic Drop &amp;/or pelvic rotation, Increased femoral IR</td>
</tr>
<tr>
<td>Single Leg Squats</td>
<td>Contralateral Pelvic Drop &amp;/or pelvic rotation, Increased femoral IR</td>
</tr>
<tr>
<td>Single Leg Rotations</td>
<td>Thoracic rotation to compensate for lack of pelvic control or endurance</td>
</tr>
</tbody>
</table>
Phase III Exercises

**SINGLE LEG BRIDGES**

**SINGLE LEG SQUAT**
Criteria To Advance to Phase IV

1) Pain Free with all Phase III Exercises
2) Proper Neuromuscular Firing with all Phase III Exercises
3) Ability to perform 3 sets of single knee bends
Weeks 12-16 for Non Microfracture, Weeks 16-20 for Microfracture

Goals

- To restore Plyometric Control and Endurance
- To Pass the Sports Test
- To return to sport specific Training
## Phase IV: Exercises

<table>
<thead>
<tr>
<th>Exercises</th>
<th>Common Compensatory Patterns</th>
</tr>
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<tbody>
<tr>
<td>Single Leg Squats</td>
<td>Contralateral Pelvic Drop &amp;/or pelvic rotation, Increased femoral IR</td>
</tr>
<tr>
<td>Lateral Agility</td>
<td>Inability to show 30 degrees of absorption and explosion, increased contralateral pelvic drop, increased femoral IR</td>
</tr>
<tr>
<td>Diagonal Agility</td>
<td>Inability to maintain level pelvis with absorption and explosion, increased contralateral drop, increased femoral IR</td>
</tr>
<tr>
<td>Single Leg Deadlifts</td>
<td>Shows increased pelvic rotation, glutes do not initiate hip extension</td>
</tr>
<tr>
<td>Single Leg Rotations</td>
<td>Inability to maintain level pelvis, overactive thoracic rotation, Rectus femoris, or hamstrings due to decreased deep rotator activation</td>
</tr>
</tbody>
</table>
Sports Test Requirements

Single Knee bends: 3 min
1 pt for each 30s performed correctly

Lateral Agility: 100s
1 point for each 20s performed correctly

Diagonal Agility: 100s
1 point for each 20s performed correctly

Forward Lunges: 2 min
1 point for each 30s performed without provocation of symptoms

SCORE 17/20 Passing
Once Sports Test is Passed, Patients are cleared to begin Sport Specific Training.

Patients should gradually progress at a 25%>50%>75%>100% rate of intensity and duration prior to returning to play.
Protocols are guidelines, treat each patient as an individual

- Hypermobile patient vs. professional football player

Identify secondary conditions due to injury that may contribute to success of recovery

- Inadequate pelvic stability
- Faulty muscle firing patterns
- Inability to transfer isolated muscle contractions to functional activities

Establish appropriate criterion to ensure progression without disruption integrity of tissue healing

- $3 \times 1\text{min SKB prior to starting a running progression or plyometrics}$
- Pass Sports test to clear patient for sports specific training
Any further Questions:

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