HIP PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES

The following periacetabular osteotomy guidelines were developed by HSS Rehabilitation. Progression is both criteria-based and patient specific. Phases and time frames are designed to give the clinician a general sense of progression. The rehabilitation program following a periacetabular osteotomy must be tailored to the exact surgical procedure performed, taking into account tissue and bone healing properties as well as neuromuscular re-education in the setting of new bony alignment. The program is developed to balance healing with gentle restoration of hip range of motion, muscular balance and stability. Special attention should be given to not irritate the psoas muscle during patient education of activities of daily living and therapeutic exercise.

**Follow physician modifications as prescribed.**
HIP PELVIS PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES

Pre-operative Phase

PRECAUTIONS
- Avoid pain with daily activities and therapeutic exercise
- No active hip flexion with a long lever arm, such as straight leg raise (SLR) flexion
- Modify or minimize activities that increase symptoms

ASSESSMENT
- Lower Extremity Functional Scale (LEFS)
- Numeric pain rating scale (NPRS)
- Sensory motor screening
- Lower extremity (LE) active range of motion (AROM) and passive range of motion (PROM)
- Thoracic and lumbar spine AROM
- Deep abdominal and LE strength
- LE flexibility
- Gait
- Current activity level and post-operative goals
- Understanding of post-operative plan of care and current home exercise program (HEP)

TREATMENT RECOMMENDATIONS
- Patient education
  - Post-operative plan of care
  - Activity modifications/limitations
  - HEP
- Bed mobility
- Transfer training
- Gait training with post-operative assistive device and weight-bearing (WB) status
- Cryotherapy
- Hip and core strengthening focusing on lumbopelvic stability through functional movement patterns

GOALS FOR PRE-OPERATIVE PHASE
- Pain controlled with daily activity and therapeutic exercise
- Understanding of post-operative plan and activity modifications
- Independent with HEP
EMPHASIZE

- Familiarization with post-operative plan of care
- Improved deep abdominal and hip muscle activation for lumbopelvic stability during functional activities
- Symptom management
HIP PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES

Post-Operative Phase 1: Day 1 - Week 6

PRECAUTIONS
• Avoid capsular irritation
• Avoid prolonged standing and walking to fatigue
• Avoid pivoting or rotating hip during ambulation
• Avoid prolonged sitting with hips flexed to 90° or greater
• Avoid pain with daily activities and therapeutic exercise
• No active hip flexion with a long lever arm, such as SLR flexion
• Foot flat WB (20%) for the first 6 weeks
• No open chain isolated hip muscle activation, unless isometric

ASSESSMENT
• LEFS
• NPRS
• Wound status
• Sensory motor screening
• LE PROM, as appropriate
• Deep abdominal and LE strength, as appropriate
• Gait with appropriate assistive device (AD)
• Functional status
• Understanding of precautions, cryotherapy and HEP

TREATMENT RECOMMENDATIONS
• Patient education
  o Precautions/activity modification
  o HEP
• Bed mobility
• Transfer training
• Gait training on level surfaces and stairs with appropriate AD
  o Foot flat WB (20%) for first 6 weeks
• Cryotherapy
• HEP
  o Supine abdominal bracing
  o Prone abdominal bracing with gluteal isometrics (pillow under hips)
  o Quadriceps set (towel under knee)
  o Ankle pumps
  o Prone knee flexion (educated at 2 weeks post-operative)

CRITERIA FOR ADVANCEMENT
• Pain controlled with daily activity and therapeutic exercise
• Normalized gait pattern with appropriate AD
• Independent with HEP
• Advance to weight bearing as tolerated (WBAT) per MD orders after 6-week follow up and review of radiographs
• Start outpatient physical therapy at 6 weeks post-operative

EMPHASIZE
  ▪ Protect surgical site
  ▪ Avoiding symptom provocation
  ▪ Foot flat WB (20%)
  ▪ Independent transfers
  ▪ Patient compliance with activity modification and HEP
HIP PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES
Post-Operative Phase 2: Weeks 7-12

PRECAUTIONS
- Avoid capsular irritation
- Avoid prolonged standing and walking to fatigue
- Avoid pain with daily activities and therapeutic exercise
- No active hip flexion with a long lever arm, such as SLR flexion
- Avoid premature progression of WB status and discharge of AD
- Avoid faulty movement patterns and postures

ASSESSMENT
- LEFS
- NPRS
- Sensory motor screening
- LE AROM and PROM
- Thoracic and lumbar spine AROM
- LE and deep abdominal strength
  - Use hand-held dynamometer, if accessible
- LE flexibility, as appropriate
  - 2 joint hip flexors
  - Calf
  - Hamstrings
- Gait
- Balance
- Functional movement patterns and postures
- Current activity level
- Understanding of precautions and HEP

TREATMENT RECOMMENDATIONS
- Patient education
  - Precautions/activity modification
  - Monitoring response to increased activity level
  - HEP
- Gait training
  - WBAT with MD clearance, gradual progression from AD as patient demonstrates normalized gait pattern
• Hip PROM and AROM, as tolerated
  o Quadruped rocking
  o Bent knee fall outs
  o Active-assisted ROM (stool rotations) for hip external rotation (ER)/internal rotation (IR), as tolerated
  o AROM (prone rotations) for hip ER/IR, as tolerated
• Hip and core strengthening, focusing on co-contraction of muscle groups
  o Hip abduction, ER and extension isometrics progressing to open and closed chain strengthening
  o Hip flexor strengthening: isometrics to heel slides to marching; limit if symptomatic, progress slowly, avoid anterior hip irritation and SLR flexion
  o Bridging: double leg to march to single leg
  o Deep abdominal strengthening progression: supine to quadruped to standing, incorporating upper extremity (UE) and LE movements
  o Standing resisted core activation with resistance band (alternating UE forward flexion, resisted trunk rotations)
• Balance/proprioception
  o Progress from double limb support to single limb support (different surfaces)
  o Weight shifts
  o Single leg balance progression
  o Balance board
• Functional strengthening
  o Leg press: double leg to eccentric
  o Squat
  o Forward step-up progression
  o Forward step-down progression
• Stationary bicycle, as tolerated
• Flexibility exercises, as appropriate
  o 1 and 2 joint hip flexors
  o Hamstrings
  o Gastrocnemius/soleus
  o Foam rolling
• Soft tissue mobilization, as appropriate
• Aquatic therapy, as appropriate
• Cryotherapy
• Progressive HEP
CRITERIA FOR ADVANCEMENT

- Pain free with daily activity and therapeutic exercise
- Normalized gait pattern
- Normalized functional movement patterns and postures
- Hip ROM within functional limits
- Able to ascend 6” step with good mechanics and control
- Independent with HEP

EMPHASIZE

- Avoiding symptom provocation
- Normalized gait mechanics
- Normalized functional movement patterns
- Protection from hip flexor and capsular irritation
- Patient compliance with activity modification and HEP
HIP PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES
Post-Operative Phase 3: Weeks 13-24

PRECAUTIONS

- Avoid hip flexor and capsular irritation
- Avoid pain with daily activities and therapeutic exercise
- Avoid faulty movement patterns and postures
- Do not ignore functional progression and cardiovascular fitness

ASSESSMENT

- LEFS
- NPRS
- Sensory motor screening
- LE PROM and AROM
- Thoracic and lumbar spine AROM
- LE and deep abdominal strength
  - Use hand-held dynamometer, if accessible
- LE flexibility
- Gait
- Balance
- Functional movement patterns and postures
- Current activity level
- Understanding of precautions and HEP

TREATMENT RECOMMENDATIONS

- Patient education
  - Monitoring response to increased activity level
  - HEP
- Progress pain free hip PROM and AROM, as appropriate
- Hip and core strengthening, address any continued impairments
  - Band walks
  - Clocks
  - Front and side plank progressions
- Balance/proprrioception
  - Continue with single leg balance progression as appropriate
  - Dynamic UE and LE movement patterns
  - Perturbation training
  - Windmills
• Progress functional strengthening
  o Squat progression: staggered stance to single leg
  o Step down progression
  o Step up progression
  o Dead lift: double leg to single leg
  o Lunges: forward static to dynamic, lateral
  o Chops/lifts
  o Cable column rotations
• Cardiovascular fitness
  o Stationary bicycle
  o Initiate elliptical when patient demonstrates ability to ascend 6” step with good lumbopelvic control and LE mechanics
• Flexibility exercises, as appropriate
• Soft tissue mobilization, as appropriate
• Aquatic therapy, as appropriate
• Progressive HEP

CRITERIA FOR ADVANCEMENT
• Pain free with daily activity and therapeutic exercise
• Normalized functional movement patterns
• Full bilateral LE strength
• Able to descend 8” stair with good control and mechanics
• Able to perform a single leg Romanian Deadlift (RDL) with good control and lumbopelvic stability
• Full ROM and flexibility to meet demands of activities
• Independent with HEP

EMPHASIZE
• Avoiding symptom provocation
• Normalized functional movement patterns and postures
• Functional strength and endurance progressions
• Protection from hip flexor and capsular irritation
• Patient compliance with activity modification and HEP
HIP PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES
Post-Operative Phase 4: Months 6-9

PRECAUTIONS
• Avoid hip flexor and capsular irritation
• Avoid pain with daily activities and therapeutic exercise
• Avoid faulty movement patterns and postures
• Do not ignore functional progression and cardiovascular fitness
• Avoid premature or too rapid return to impact loading

ASSESSMENT
• LEFS
• NPRS
• Sensory motor screening
• LE PROM and AROM
• Thoracic and lumbar spine AROM
• LE and deep abdominal strength
  o Use hand-held dynamometer, if accessible
• LE flexibility
• Gait
• Balance
• Functional movement patterns and postures:
  o Single leg stance
  o Squat
  o Single leg squat
  o Forward step up
  o Forward step down
• Current activity level
• Understanding of precautions and HEP
TREATMENT RECOMMENDATIONS

- Patient education
  - Monitoring response to increased activity level
  - HEP
- Continue to address any functional ROM, flexibility, strength, endurance and control deficits
- Progress functional and activity specific balance/proprioception
- Functional strengthening through activity specific movement patterns
  - Multi-plane involvement focusing on muscle co-contraction
- Cardiovascular fitness to meet demands of activity
  - Stationary bicycle
  - Elliptical
  - Swimming (freestyle only)
- Initiate return to running progression (see Appendix 1)
- Initiate plyometric progression (see Appendix 2)
- Soft tissue mobilization, as appropriate
- Aquatic therapy, as appropriate
- Initiate gym program, as instructed
- Progressive HEP

CRITERIA FOR DISCHARGE OR ADVANCEMENT TO PHASE 5 IF RETURNING TO PLAY

- Pain free with daily activity and therapeutic exercise
- Normalized functional movement patterns and postures
- Full bilateral LE strength
- Full ROM and flexibility to meet demands of activities
- Independent with HEP

EMPHASIZE

- Quality of movement
- Functional progression
- SL strength
HIP PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES
Phase 5: 9+ Months

PRECAUTIONS

- Avoid hip flexor and capsular irritation
- Avoid pain with daily activities and therapeutic exercise
- Avoid faulty movement patterns and postures
- Note importance of gradual return to activity participation with load and volume monitoring under guidance of physical therapist, referring MD, athletic trainer (ATC) and coach
- Avoid premature or too rapid return to sport

ASSESSMENT

- LEFS
- NPRS
- Sensory motor screening
- LE PROM and AROM
- Thoracic and lumbar spine AROM
- LE and deep abdominal strength
  - Use hand-held dynamometer, if accessible
- LE flexibility
- Gait
- Balance
- Functional assessment
  - Example: HSS Quality Movement Assessment (QMA)
- Current activity level
- Understanding of precautions and HEP
TREATMENT RECOMMENDATIONS

- Patient education
  - Graded return to activity
  - Monitoring response to increased activity level
  - HEP
- Functional strengthening in activity specific movement patterns
- Agility exercises to address sport specific demands
- Advance plyometric progression
- Cardiovascular fitness to match demands of activity
  - Stationary bicycle
  - Elliptical
  - Graded running program
  - Return to swimming program
- Flexibility exercises, as appropriate
- Aquatic therapy, as appropriate
- Progress gym and HEP
- Initiate performance training, as appropriate
- Consult with referring MD on return to sport timing and any recommendations or limitations
- Collaborate with ATC, coaches and trainers to monitor load and volume as patient prepares for and initiates return to participation

CRITERIA FOR DISCHARGE/RETURN TO SPORT

- Pain free
- Demonstrates movement patterns, functional strength, flexibility, motion, endurance, power, deceleration, and accuracy to meet the demands of sport
- Referring MD clearance for return to sport
- Independent with gym program and HEP

EMPHASIZE

- Avoiding symptom provocation
- Sport specific movement patterns, strength, endurance, accuracy and power
- Patient compliance with gym program and HEP
Example 1

- **Week 1**
  - Run: 30 seconds
  - Rest/Walk: 30 seconds
  - Reps: 3
- **Week 2**
  - Run: 1 minute
  - Rest/Walk: 1 minute
  - Reps: 3
- **Week 3**
  - Run: 2 minutes
  - Rest/Walk: 1 minute
  - Reps: 2
- **Week 4**
  - Run: 4 minutes
  - Rest/Walk: 2 minutes
  - Reps: 1
- **Week 5**
  - Run: 4 minutes
  - Rest/Walk: 2 minutes
  - Reps: 2
- **Week 6**
  - Run: 8 minutes
  - Rest/Walk: n/a
  - Reps: 1

Example 2

1. Retro running 30” on treadmill or Alter-GTM run 30” 80% WB, progressing to 95% WB
2. Treadmill forward running 30”, advancing to 1’ (note: not jogging, not sprinting, but running)
HIP PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES
Appendix 2: Phase 4 - Examples of Plyometrics Progression

Example 1
- Week 1: Onto box
- Week 2: In place and jumping rope
- Week 3: Drop jumps
- Week 4: Broad jumps
- Week 5: Side to side hops
- Week 6: Hop to opposite

Example 2
1. Bilateral plyometrics on leg press
2. Bilateral jumps onto a 6” box
3. Bilateral jumps in a cross pattern, e.g., clockwise (below right) and counterclockwise (below left)
4. Bilateral jumps on/off box 6” / 8” / 12”
5. Unilateral jumps in a cross pattern, e.g., clockwise (below right) and counterclockwise (below left)
6. Unilateral jumps on/off box
HIP PERIACETABULAR OSTEOTOMY POST-OPERATIVE GUIDELINES

References


Created: 6/2020