KJ Hippensteel, M.D., FAAOS
Sports Medicine
OrthoArizona
P: (602) 795-6300 ext 3174

HIP ARTHROSCOPY WITH BONE MARROW ASPIRATE CONCENTRATE (BMAC) POST-OPERATIVE GUIDELINES

Progressions in this guideline are both criteria-based and can be modified for individual patient needs. Phases and time frames are designed to give the clinician a general sense of progression. The rehabilitation program following BMAC emphasizes early, controlled motion to prevent hip stiffness and to avoid disuse atrophy of the musculature. The program should be a balance of managing prior deficits, tissue healing and appropriate interventions to maximize flexibility, strength, and pain-free performance of functional activities. This model should not replace clinical judgment.

This patient population may have had additional concomitant surgical procedures. Defer to the surgeon for additional directions and modifications to this protocol. Monitor pain throughout the rehabilitation process. If persistent pain occurs, monitor load volume and consult with the referring surgeon.

FOLLOW SURGEON'S MODIFICATIONS AS PRESCRIBED.

KJ Hippensteel, M.D., FAAOS
Sports Medicine
OrthoArizona
P: (602) 795-6300 ext 3174

HIP ARTHROSCOPY WITH BONE MARROW ASPIRATE CONCENTRATE (BMAC) POST-OPERATIVE GUIDELINES

Post-Operative Phase 1: Weeks 0-2

PRECAUTIONS

- Adhere to weight bearing guidelines
  - Weight bearing as tolerated with bilateral axillary crutches
  - Avoid premature discharge of assistive device (AD). Gradually progress weight bearing per surgeon recommendations as to avoid gait deviations and pain
  - Avoid joint overload

ASSESSMENT

- Lower Extremity Functional Scale (LEFS)
- Numeric Pain Rating Scale (NPRS)
- Screen for red flags
- Inspection of incision and wound
- Neurological status (global and local to surgical site)
- Bilateral hip active range of motion (AROM) and passive range of motion (PROM)
- Lower extremity (LE) flexibility
- Pelvic/hip/LE muscle activation (quadriceps, gluteals, core musculature)
- Sitting tolerance
- Ambulation with use of AD
- Stair ambulation technique and tolerance
- Use of cryotherapy

TREATMENT RECOMMENDATIONS

- Patient education
- Gait training with AD
  - Progress to no AD
- Soft tissue mobilization, if applicable
  - Quadriceps, hamstrings, abductors, adductors

- Hip range of motion (ROM) – DO NOT FORCE PROM
    - Circumduction
    - Flexion
    - Internal rotation in hip flexion and in prone as tolerated
    - Upright bike 10-20 minutes per day without pain
    - Quadruped rocking into hip flexion
- LE stretching
    - Hamstrings, quadriceps, gastrocnemius/soleus
- Strengthening
    - LE isometrics
        - Isometric quadriceps sets
        - Isometric gluteal sets
    - Core/pelvic stability (progress to standing and avoid hip flexor tendonitis)
        - Abdominal setting in supine
        - Prone abdominal setting with gluteal sets
        - Standing band shoulder extension
        - Standing alternating band shoulder extension
        - Standing Pallof press
    - Short arc and long arc quadriceps exercises
    - Supine gluteal bridges with resistance band hip abduction
    - Supine bent knee fall-out with pelvic stability
- Edema control (cryotherapy) 4-5 times per day or more
- Independent with home exercise program (HEP) that addresses primary impairments

CRITERIA FOR ADVANCEMENT

- Ambulation without AD or gait deviations
- Upright bike tolerance for minimum of 10 minutes
- No pain at rest and with ambulation
- Controlled post-operative pain and swelling
- Independent with HEP

EMPHASIZE

- Minimize pain and inflammation
- Protection of injection site
- Patient compliance with activity modification

HIP ARTHROSCOPY WITH BMAC POST-OPERATIVE GUIDELINES

Post-Operative Phase 2: Weeks 3-6

PRECAUTIONS

- Avoid generating hip flexor tendonitis

ASSESSMENT

- LEFS
- NPRS
- Work and ADL tolerance
- Bilateral hip AROM and PROM
- Soft tissue mobility, including: tensor fascia lata, quadriceps, adductors, gluteals
- LE flexibility
- Pelvic/hip/LE muscle activation (quadriceps, gluteals, core musculature)

TREATMENT RECOMMENDATIONS

- ROM
  - Continue exercises from phase I
- Soft tissue mobilization
  - Continue as needed from phase I
  - Sidelying runners facial stretch
  - Sidelying fascial peel and stretch
- LE stretching
  - Continue exercises from phase I
  - Supine dynamic hamstring stretch
  - Hip flexor stretching – supine progressing to half kneeling
- Strengthening
  - Progressive gluteal/hip strengthening
    - Prone firing sequence (contract abs→glutes→quads→ankle dorsiflexion)
    - Standing clamshells
    - Single leg (SL) wall push
    - Gluteal bridge progression
    - Standing hip clocks
    - Lateral/monster walks

- Functional strengthening
    - Continue with stationary bike 20 minutes per day
    - Standing bilateral heel raises
    - Leg press
    - Mini squats progressing to full squat to plyometric box or chair
        - Gradually increased depth as to avoid hip flexor irritation
- Progress with core stability/kinetic linking
    - Modified side plank – progressing to full side plank
    - Modified front plank - progressing to full front plank
    - Isometric dead bug - progressing to dynamic dead bug
    - Quadruped bird dog
    - Standing cable column or band resistance
        - Standing contralateral stability with elastic bands (e.g. core rotations, stir the pot)
- Initiate step up/step down
    - Start with 4” step and progress to 8“ with adequate strength
    - Emphasize proper movement pattern (no hip drop, no valgus breakdown)

- Balance and proprioception training
    - Double leg (DL) rocker board balance
    - Single Leg (SL) stance with good pelvic/core control- no hip drop
- Progress to elliptical with adequate pelvic stability- by week 6
- Hydrotherapy when incisions are healed - weeks 4-6 for proximal strengthening, functional movements, balance
- Continued cryotherapy as needed to aid with inflammation control
- Independence with progressive HEP

CRITERIA FOR ADVANCEMENT

- Ascend/descend 8” step with good pelvic control
- Within functional limits (WFL) pain-free PROM throughout hip joint
- SL stance with good pelvic control
- Pain free ADL
- DL squat with proper hip hinge and depth to 90˚

EMPHASIZE

- Minimize pain and inflammation
- Proper movement patterns to avoid overload of hip joint and hip flexor tendonitis

HIP ARTHROSCOPY WITH BMAC POST-OPERATIVE GUIDELINES

Post-Operative Phase 3: Weeks 7-12

PRECAUTIONS

- Avoid symptom provocation
- Avoid faulty movement patterns during exercise

ASSESSMENT

- LEFS
- NPRS
- Work and ADL tolerance
- Soft tissue mobility, including: tensor fascia lata, quadriceps, adductors, gluteals
- Bilateral hip AROM and PROM
- LE flexibility
- Strength Assessment: hand-held dynamometry
- Movement assessment for overall quality of movement
    - DL squat
    - 8” step up/down control
    - SL squat
    - SL stance
- Core control assessment
    - E.g. Bunkie test[1]

TREATMENT RECOMMENDATIONS

- ROM
    - Continue to maintain WFL pain free ROM
- Soft tissue mobilization
    - Avoid over mobilization of tissue
    - Focus soft tissue treatment to hypertonic tissues only
    - Scar mobilization if necessary
- LE stretching

- Strengthening
    - Leg press progression
        - Double Leg → Single Leg
        - SL eccentric leg press
    - Lunges- static and traveling
    - Squats
        - DL → SL
        - Emphasize -proper hip hinge during activity
    - Step up/down
        - Progress with step height and weight
        - Emphasize good pelvic control
- Core strengthening
        - Dynamic front and side planks
            - Front plank with LE extension
            - Modified side plank with rotation or straight leg abduction
        - Standing cable/band core rotations- progress DL → SL
        - SL pallof press
        - Standing cable diagonals
- Proprioception and balance activities
    - SL rebounder on varying surfaces
    - Windmills
    - Lawnmowers with band/cable resistance
    - SL stance with external perturbations
- Cardiovascular training
    - Progress bike intervals - progress with time and resistance as tolerated
    - Elliptical – progress with time and resistance as tolerated
- Initiate plyometric program if adequate strength base is present (weeks 12+)
    - DL with proper landing techniques emphasized
- Initiate running program with sufficient SL stability (weeks 12+)
    - 8” step up/down with pelvic control
    - 60 second SL side plank
    - Monitor for weakness/faulty movement patterns

CRITERIA FOR ADVANCEMENT

- Manual muscle testing graded 5/5 lower extremity strength
- Core control: 60 second front/side plank
- Pelvic control with single limb activities

EMPHASIZE

- Minimize pain and inflammation

HIP ARTHROSCOPY WITH BMAC POST-OPERATIVE GUIDELINES

Post-Operative Phase 4: Weeks 13+

PRECAUTIONS

- Avoid symptom provocation
- Avoid overload of joint

ASSESSMENT

- LEFS
- NPRS
- Work and ADL tolerance
- Bilateral hip AROM and PROM
- LE flexibility
- Strength Assessment: hand-held dynamometry
- Movement assessment analyzing overall quality of movement
    - DL squat
    - Forward step down control
    - SL stance
    - SL gluteal bridge
    - Jumping and hopping
    - Deceleration and directional changes
- Core control assessment
    - Bunkie test[1]
- Cardiovascular exercise tolerance

TREATMENT RECOMMENDATIONS

- Advanced trunk and hip strength and endurance exercises
    - HEP and gym strengthening program, as instructed: strength and flexibility exercises
    - Independent foam rolling/soft tissue release program
    - Goblet/front/back squats – as tolerated
- Deadlifts – DL and SL
- Progressive cardiovascular training
    - Treadmill running program
    - Stepping machine

- Sport specific training progression
- Advanced plyometric training
    - DL → SL
    - Emphasize proper pelvic and LE control and landing
- Advanced kinetic linking
    - Cable lifts/chops
    - Landmine push press
    - Weighted ball vs wall throws
- Return to sport recommendations (Week 14+)
  BEGIN ONLY IF RETURNING TO SPORT WITH SURGEON CLEARANCE
    - Eccentric quadriceps strengthening; hamstring and gluteal strength and control
    - Core stabilization / endurance tasks
    - Progressive resistance exercises
    - Low-medium impact cardiovascular conditioning
    - Low-medium impact agility drills
    - Dynamic balance activities
    - Sports-specific warm-up and activities
    - Low impact plyometrics (hopping, skipping) progressing to appropriate impact depending on sport
    - Consider working with a performance specialist specific to the sport or activity

CRITERIA FOR ADVANCEMENT

- Full pain free ROM
- No pain after advanced activity
- 90% limb symmetry (hip musculature) with dynamometry and functional testing
- Independent with gym strengthening and maintenance program
- Independent with self-soft tissue and fascial manipulation program