CONWAY ORTHOPEDIC & SPORTS MEDICINE CENTER

Austin Cole, MD

Articular Cartilage Restoration- Tibiofemoral Compartment

Post-Operative Protocol

Phase I - Maximum Protection

Weeks 0-6

- Brace 0-30 degrees
- Weight bearing progression with use of axillary crutches
  - Week 1: <20% of body weight
  - Weeks 2-3: progress to 30% of body weight
  - Weeks 4-6: progress to 60% of body weight
- Initiate quadriceps muscle activation
- Initiate range of motion (restrictions apply to unloaded and loaded motion)
  - Week 1: 0-45 degrees flexion
  - Weeks 2-3: 0-90 degrees flexion
  - Weeks 4-6: 0-125 degrees flexion
- CPM use 6 hours a day for 6 weeks
  - No brace use when using CPM
  - Range of motion on CPM consistent with ROM restrictions listed above.

Goals

- Reduce inflammation and pain
- Protect surgical repair
- Maintain full knee extension range of motion
- Gradually progress knee range of motion per above restrictions
- Maintain strength and motion of non-operative joints
- Quadricep activation

Exercise progression

- Passive/active knee range of motion
- Calf and hamstring stretches
- Quad sets, hamstrings sets, glute sets, heel raises
- Multi-plane open kinetic chain strengthening (i.e. straight leg raises, avoid patellofemoral provocative exercises)
- Initiate bike with no resistance to facilitate ROM at 4 weeks
- Use of BFR (blood flow restriction) therapy to facilitate strengthening during weight bearing restrictions
- Patellofemoral mobilizations
- Gait training
- Elevation and cryotherapy to assist with swelling reduction

Phase II- Progressive Stretching and Early Strengthening

Weeks 6 to 12:

- Brace unlocked allowing full flexion mobility. Discontinue brace when full weight bearing
- Weight bearing progression with use of single axillary crutch
    - Weeks 7-8: progress to 80% of body weight
    - Weeks 9-10: progress to full weight bearing with no assistive device
- Full range of motion
- Progress closed chain strengthening from double limb to single limb
- Initiate balance and proprioception exercises

  Goals
    - Reduce inflammation and pain
    - Protect surgical repair
    - Full knee range of motion
    - Maintain strength of non-operative joints
    - Normalizing gait pattern

  Exercise progression
    - Able to gradually increase resistance on bike at 6 weeks
    - Initiate elliptical at 12 weeks
    - Initiate closed chain strengthening in double limb progressing to single limb
    - Maintain squat depth at 90 degrees or above
    - Step up progression
    - Gait training
    - Elevation and cryotherapy to assist with swelling reduction

Phase III- Progressive Strengthening

Weeks 12 to 24:

- Discontinue brace
- Full weight bearing
- Advance strengthening exercises
- Balance and proprioceptive exercises

  Goals
    - Reduce inflammation and pain
    - Protect surgical repair
    - Full knee range of motion
    - Progress limb strength
    - Normal gait pattern

  Exercise progression
    - Progress closed chain single and double limb strength as able
        - Avoid patellofemoral provocative exercises (lunges, open chain leg extension)

Phase IV- Advanced Strengthening, Running Progression, and Plyometric Training

Months 6 to 9:

- Administer Preliminary functional test at 6 months for MD to review
- Initiate straight line jogging at 6 months if proper biomechanics are demonstrated and symmetry on functional test
- Initiate plyometric training in double limb with gradual progression to single limb
- Advance strengthening program
- Able to return to low-impact recreational activities (walking, biking, elliptical, swimming)

Goals

- No swelling
- Full range of motion
- Normal gait pattern
- Symmetrical strength and power

Exercise progression

- Single limb closed chain strengthening
- Proprioception drills
- Basic ladder series
- Linear jogging progression
- Basic plyometric box progression
- Gym strengthening progression

Phase V- Return to Sport

Months 9 to 12:

- Progress plyometric training to single limb, multi-plane, change of direction, and deceleration
- Advance strengthening program
- Administer Return To Sport functional test prior to 12 month follow up appointment with MD for physician to review

Goals

- No swelling
- Full range of motion
- Normal gait pattern
- Symmetrical strength and power

Exercise progression

- Advanced ladder series
- Change of direction with running and jumping
- Sport specific field/court drills
- Gym strengthening progression

Criteria to be released for return to sport

- Follow-up examination with the physician
- Pass Return To Sport functional test at >90% (involved vs. uninvolved limb)
- Display symmetry and confidence in high-speed cutting, multi-plane plyometric drills, sprinting and decelerating

Anticipated return to sport:

- 12 months for contact and non-contact athletes