PLANO ORTHOPEDIC
& SPORTS MEDICINE CENTER

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Postoperative Protocol

Patellofemoral Cartilage Restoration (MACI)

Phase 1 – Maximum Protection
Weeks 0 to 6

- Brace locked 0-30 degrees
- Weightbearing progression with use of axillary crutches
  - Week 1: <20% of body weight
  - Weeks 2-4: Progress from 20% to 50% of body weight
  - Weeks 5-6: Progress to full weight bearing
- Initiate quadriceps muscle activation
- Initiate range of motion (restrictions apply to unloaded and loaded motion)
  - Week 1: 0-45 degrees flexion
  - Weeks 2-4: 0-60 degrees flexion
  - Weeks 5-6: 0-125 degrees flexion

Goals:

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

Exercise Progression:

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

Phase 2 – Progressive Stretching and Early Strengthening
Weeks 6 to 12

- Unlock brace at 6 weeks and discontinue once full weight bearing
- Weight bearing as tolerated progressing to full weight bearing
- Full range of motion
- Initiate closed chain strengthening
- Initiate balance and proprioception exercises

Goals:

- Reduce pain and inflammation
- Protect the surgical repair
- Full knee range of motion
- Maintain strength of non-operative joints
- Full weight bearing by 8 weeks, no assistive device
- 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 3 – Progressive Strengthening
Weeks 12 to 24

- Advance strengthening program
- Balance and proprioceptive exercises

Goals:

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

Exercise Progression:

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

Phase 4 – Advanced Strengthening, Running Progression, Plyometric Training
Months 6 to 9

- Administer preliminary functional test at 6 months for physician to review
- Initiate straight line jogging at 6 months if proper biomechanics are demonstrated and symmetry on function test
- Advance strengthening program
- Initiate plyometric training progressing in double limb with gradual progression to single limb
- 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 5 – Return to Sport
Months 9 to 12

- Progress plyometric training to multi-plane, change of direction, and deceleration
- Advance strengthening program
- Administer return to sport function test prior to 12 month follow-up appointment 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 for return to play:

- Follow-up examination with the physician
- Pass return to sport function 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