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(MACI) MATRIX-INDUCED AUTOLOGUS CHONDROCYTE IMPLANT FEMORAL CONDYLE PROTOCOL (Dr. Akbar Nawab)

GENERAL GUIDELINES: (0-3 Months following surgery)

- Patients typically start formal PT at one week after surgery; patients will work towards pain-free and full passive knee extension with limited weight-bearing. Safety with crutches/walker will need to be assessed pre and post-op. Over time, the goal is to be free of ambulation devices and knee braces while becoming thoroughly independent with rehabilitation exercises.

Week 1

- Start CPM 0-30° (12-24 hours after surgery) and utilize at least one hour each day.
- Check incision and swelling assessment. Check for DVT.
- Use crutches at all times and <20% weight bearing
- Brace locked in full extension with sleeping and walking. Unlocked 0-30° with transfers sitting and NWB ADL's.
- Elevate the entire leg. Do not place pillows under the knee for long periods of time.
- Restore knee extension (low load-long duration stretching).
- Hamstring/gastrocnemius stretches.
- Ankle ROM for swelling and DVT prevention.
- ROM of knee (assisted heel slides): 0°-30°
- NMES (with BFR if indicated) for Quadriceps activation and re-education.
- Initiate SLR's and Hip ABD as tolerated with knee extended and no brace.

Weeks 2-3

- Progress to 30% weight bearing with appropriate assistive device (encourage heel-toe gait)
- Brace unlocked to 0-30° week 2, then 0-45° week 3
- Restore patellar mobility as incision heals
- ROM of knee: 0-30° week 2, then 0-90° week 3
- Initiate remainder of open chain straight leg exercises. *Focus on the knee remaining locked in the concentric and eccentric phase. Increase reps and hold time initially, before adding resistance.*
- Restore knee extension (low load-long duration stretching).

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- Continue with NMES, BFR, open chain strengthening/stretching and other modalities for swelling and DVT prevention per PT POC

Weeks 4-6

- Progress to 40%-60% weight bearing with 1-2 crutches.
- ROM of knee: 0-110° by week 4 and increase to 125° by week 6
- May unlock brace 0°-60° at week 4 and increase to full flexion by week 6
- Normalize gait with full knee ROM in the brace by week 6
- Initiate cycle for ROM as tolerated with PF protection
- Focus on an independent home exercise program.
- Perform simple ADLs with assistance of crutches (navigating stairs, showering, etc.)

Weeks 7-12

- Initially progress weight bearing to 80% at week 7 and then progress to FWB at 8-10 weeks.
- Go without crutches indoors and one crutch if outdoors (or unfamiliar areas)
- Discontinue brace at week 7 if no extension lag with SLR.
- Regain full ROM
- Continue stationary cycle
- Quadriceps stretching weeks 9-10
- Initiate closed chain exercises; avoid PF pain to focus on strength and proprioception.
- Start driving again and return to office or seated work.

3-6 Months

- Increase resistance with all exercises as tolerated.
- Full and pain-free AROM, no brace, and no assistive devices.
- Increase leg strength to allow for normal gait and walking longer distances.
- Leg press 0-60° and progress to 0-90°
- Forward lunges and wall squats
- Return to low impact recreational activities including: cycling, yoga & Pilates, swimming, elliptical/treadmill, golf, rowing/kayaking, and dancing.
- Return to a more physically active job such as nursing or construction.
- Return to daily activities that require strength/endurance.

6-9 Months

- Agility and balance drills can be initiated.
- Walking >3 miles
- Continue with swimming, cycling, and elliptical and increase distance for endurance as tolerated

9-12 Months

- Jogging, running, and high impact aerobics are allowed

- High impact sports such as tennis, football, basketball, skiing and snowboarding are allowed at 12+ months