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(MACI) MATRIX-INDUCED AUTOLOGUS CHONDROCYTE IMPLANT PATELLA/TROCHLEA 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.
- Patellofemoral protection restrictions with all exercises.

Weeks 0-1

- Start CPM 0-30° (12-24 hours after surgery) and utilize at least one hour each day.
- Use crutches at all times and <20% weight bearing
- Brace locked in full extension with transfers, sitting, sleeping and walking.
- 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°-20°
- NMES (with BFR if indicated) for Quadriceps activation and re-education.

Weeks 2-3

- Progress to 50% weight bearing with appropriate assistive device (encourage heel-toe gait)
- Brace locked in full extension with transfers, sitting, sleeping and walking.
- Restore patellar mobility as incision heals
- ROM of knee: 0-30° by week 2, then 0-60° by week 3
- Initiate 4-way 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).
- Continue with NMES, BFR, open chain strengthening/stretching and other modalities for swelling and DVT prevention per PT POC

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Weeks 4-6

- Progress to 75% weight bearing. Progress to one crutch by week 6
- ROM of knee: 0-90° by week 4, then 0-125° by week 6
- Initiate cycle for ROM as tolerated with PF protection
- May unlock brace to 90° with walking if full extension is maintained and no lag with SLR
- Focus on an independent home exercise program.
- Perform simple ADLs with assistance of crutches (navigating stairs, showering, etc.)

Weeks 7-12

- Full weight-bearing as tolerated without crutches
- Progress out of the brace if the patient has good leg control and a functional gait pattern.
- Regain full ROM
- Quadriceps stretching weeks 9-10
- Continue stationary cycle
- 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