Knee – Quadriceps / Patellar Tendon Repair Rehabilitation Protocol (Non-Athletic Population)

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Key Surgical Note

To ensure the integrity of the surgical repair, the knee must remain in full extension during both ambulation and periods of rest. Patients should avoid any active knee extension or loaded flexion for the first six weeks following surgery. Special attention should be given to wound care and the management of edema. Safe mobility is essential and should be facilitated by the use of assistive devices.

Phase I — Protection & Immobilization (0–6 Weeks)

Goals

- Protect the surgical repair.
- Control pain and swelling.
- Prevent joint stiffness.
- Maintain patellar mobility.
- Promote safe ambulation.

Precautions

- Brace should be locked in full extension at all times.
- Patient should remain non-weight bearing (NWB) initially, progressing to partial weight bearing by four weeks.
- Avoid active knee extension.

Interventions

- Cryotherapy for pain and swelling control.
- Isometric quadriceps contractions (quad sets).
- Ankle pumps to promote circulation.
- Hip abduction and adduction exercises while in the brace.

- Patellar mobilization techniques.
- Transfer training to ensure safe movement.

Criteria to Advance to Phase II

- Pain rated ≤ 3 out of 10.
- Passive knee flexion of at least 45 degrees.
- Surgical incision is healed.
- Minimal swelling present.

Phase II — Controlled Motion & Basic Strength (6–12 Weeks)

Goals

- Gradually restore range of motion, starting from 0–90 degrees and progressing to 120 degrees.
- Regain quadriceps activation.
- Progress weight bearing to full as tolerated.

Precautions

- Avoid resisted knee extension.
- Do not perform deep knee flexion beyond 90 degrees.

Interventions

- Stationary bike without resistance.
- Heel slides to promote knee flexion.
- Seated knee flexion exercises.
- Gentle mini-squats within 0–45 degrees range.
- Leg press limited to 0–45 degrees range.
- Gait and balance training.

Criteria to Advance to Phase III

- Full knee extension achieved.
- Knee flexion of at least 120 degrees.
- Normal gait pattern established.
- Pain rated ≤ 2 out of 10.

Phase III — Strength & Functional Control (3–6 Months)

Goals

- Improve muscle strength and endurance.
- Enhance balance for daily activities.
- Restore ability to negotiate stairs and achieve independence in mobility.

Precautions

- Avoid impact loading.
- Do not use heavy resistance until at least five months post-surgery.

Interventions

- Step-ups to promote functional strength.
- Wall sits for quadriceps endurance.
- Terminal knee extensions using low resistance.
- Balance and proprioception drills.
- Elliptical training or pool therapy as tolerated.

Criteria to Advance to Phase IV

- Strength at least 80% of the uninvolved limb.
- Ability to independently navigate stairs.
- No swelling present.

Phase IV — Functional Restoration & Community Return (6–9 Months)

Goals

- Regain confidence and endurance for community ambulation.
- Strengthen for light recreational activities.

Interventions

- Progressive walking program.
- Low-impact aerobic conditioning.
- Progressive resistance exercises.
- Task-specific training, such as lifting, kneeling, and squatting.

Discharge Criteria

- Strength at least 90% of the uninvolved limb.
- Full, pain-free range of motion.
- Independent functional mobility.
- Physician clearance to return to normal activities.

Selected References

1. Shelbourne KD et al. Rehabilitation after patellar tendon repair. American Journal of Sports Medicine. 2006; 34(6): 889–896.
2. Hsu AR et al. Management and outcomes of extensor mechanism repair. Journal of Knee Surgery. 2021; 34(4): 372–380.
3. Cuozzo F et al. Outcomes following quadriceps tendon repair in nonathletic populations. Clinical Orthopaedics and Related Research. 2020; 478(9): 2106–2115.

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