

# Combined Medial Patello Femoral Ligament (MPFL) Reconstruction with Plate Assisted Tibial Tubercle Osteotomy plus Distalisation

## Setting

Physiotherapy

## Staff

Musculoskeletal Physiotherapists

## Patients

MPFL reconstruction plus Plate Assisted Tibial Tubercle Osteotomy (TTO)

## PROTOCOL

This protocol is a general guide to rehabilitation. The time scales are an approximate guide and may be altered depending on various factors such as pain, swelling and muscle control. Pain along the MPFL graft and osteotomy graft site is relatively common for up to 4 months postoperatively and should not prevent participation in rehabilitation. The patient's management should be tailored to meet individual objectives.

The MPFL is reconstructed using a hamstring graft. It is attached in the medial femoral condyle with a screw, there is a drill hole through the patella, and attached laterally with an endobutton.

The tibial tubercle is osteotomised and distalised/medialized to either:

1. Correct patella alta and lateral patella conflict
2. To stabilize the patella

Rehabilitation aims to protect the reconstruction in the early stages and to maximise the range of motion, strength and function.

Please check the post-operative notes for any variation in management.

## PREPARATION FOR SURGERY

- Build muscle strength. It will be easier to bounce back after surgery
- Ensure a full range of motion. Preoperative stiffness leads to post-operative stiffness
- Prepare your home. Stairs can be difficult in the first few days. Do you have a downstairs bed and bathroom?
- Social-supportive friends and family are very helpful
- Work preparation. Does your workplace know you are having surgery? Have you considered sedentary work whilst undergoing rehabilitation?
- Stop smoking and restrict alcohol intake

## WEEKS 1-3

Inflammatory stage. No initial blood supply to the graft.

### Aims

- Decrease/control swelling and pain
- Full active and passive extension, flexion
- Good quads contraction and ability to SLR in a brace
- Full weight-bearing as tolerated with brace locked in extension
- When not mobilising the brace can be removed
- Consider rectus femoris length and positions to stretch

## POST-OPERATIVE

- Active and active-assisted knee flexion out of brace
- Static and inner range quadriceps exercises, Straight leg raise taught (test rather than exercise)
- Mobilise weight-bearing as tolerated with crutches in a brace locked in extension
- Ankle dorsiflexion/plantarflexion exercises, including weight-bearing calf stretches
- Swelling management
- Scar management following wound review



## WEEKS 1–3

## POST-OPERATIVE

- Start basic proprioception, balance and coordination training
- Consider core and hip stability exercises
- Education regarding rehabilitation, and what to expect at each milestone. Address any fear-avoidance issues—reiterate the importance of the patient taking responsibility for increasing ROM and function

### Contraindications

- No resisted open-chain quads (osteotomy site), no resisted hamstrings or flicks for 8/52 (hamstring graft)

## WEEKS 3–6

2/52 Clinic review for removal of sutures and X-ray. The graft is at its weakest at 6/52.

### Aims

- Full extension (normal/hyper-extension) and near full flexion
- Good activation of quadriceps and straight leg raise with no lag
- Minimal pain
- Mild/stable effusion
- Normal gait pattern without crutches
- ROM 0°–90°+
- Mobile without brace ASAP

## POST-OPERATIVE

- Discard brace
- Swelling management
- Mobilise weight-bearing as tolerated with crutches
- Wean off brace ASAP, use crutches for knee control
- Scar mobilisation—soft tissue techniques to rectus femoris gentle stretching, concentric and eccentric exercises
- Patella mobilizations
- Proprioception, balance and coordination training
- Core and hip stability exercises
- Progress closed chain quadriceps exercises with co-contraction double leg wall mini squats, sit to stand, lunges (onto step if PFJ pain problematic)
- Closed chain knee flexion exercises
- Hamstring donor site management—soft tissue techniques, gentle stretching, concentric and eccentric exercises
- Patella mobilizations—no lateral glides
- Proprioception, balance and coordination training
- Core and hip stability exercises
- Gait re-education; sit to stand, stair re-education—encourage incorporation into ADL

### Considerations

- Quality of movement to ensure maximum contact points

### Precautions

- Avoid overstressing fixation/osteotomy with overpressure into flexion

### Contraindications

- Resisted open-chain quads—due to PFJ overload/osteotomy site

## WEEKS 6–12

The graft goes starts the process of revascularization and ligamentisation.

## POST-OPERATIVE

Exercises need to be tailored to their functional aim.

- Once 100° flexion is achieved and has minimal swelling, can start using a stationary bike on minimal resistance



## WEEKS 6–12

### Aims

- Controlled pain and swelling. Full ROM—must exceed 90° flexion (by 6/52)—if not, contact consultant team
- Increase quadriceps and VMO control for the restoration of proper patella tracking
- Good proximal alignment and control
- Quality of movement to ensure maximum contact points
- X-ray review at 6/52—to review osteotomy site healing

## POST-OPERATIVE

- Progressive closed chain, eccentric control exercises
- Road cycling—no clips or cleats, flat pedals only
- CV fitness
- Proprioceptive exercises—add controlled rotational exercises
- Swimming—freestyle and pool walking

### Contraindications

- No resisted open-chain quads or impact activity until osteotomy united
- No resisted hamstrings until 8/52
- No breaststroke until 3 months

## WEEKS 12–16+

Clinic review at 4/12 the osteotomy site should be united and confirmed on X-ray.

### Aims

- Full pain-free TFJ & PFJ ROM
- Full-length rectus femoris
- Good quads and pelvic control in single knee dip
- Raise fitness targets and set new goals
- Increase speed of balance reactions and improve coordination
- Normal gait in running. Good control of cutting, pivoting, stopping and starting if required
- Sport-specific exercises progressively sequenced to include walking followed by running forwards/backwards/sideways; changing directions
- Advice on returning to training

By 3 months the graft fixation is consolidated. At 4 months there is complete revascularization of the graft, laying down of collagen and gradual increase in strength.

### Aims

- Knee extension strength at least 70% of the other knee. Good active patella control with no evidence of lateral tracking or instability

## POST-OPERATIVE

- Increase fitness
- Introduction of impact work—only if a full range of extension, eccentric quadriceps control with correct alignment. An X-ray has confirmed union
- Gradual increase in resisted open-chain/closed chain quadriceps (avoid pain)
- Continue with proprioceptive training—increase rotational control
- Initiate running—gradual paced change of terrain/gradient and duration
- Progressive introduction of dynamic activity:
  - jumping/hopping (start on the trampette, emphasis on alignment of both push off and land)
  - change of direction; start single direction and progress to cutting, multidirectional and pivoting
  - stopping/starting and acceleration/deceleration
  - backwards running

## MONTHS 6+

### Aims

- Non-contact sports training
- Suggest return to sport at 6–9 months

## POST-OPERATIVE

### Before returning to sports training

- Satisfactory single limb dynamic control
- 85% hop for height, length and cross over
- 80% strength of non-involved limb
- Confidence in knee
- Return to activity non-contact training initially



Clinic review at 1 year for X-ray and outcome scores. If all well patient is discharged.

---

## FUNCTIONAL MILESTONES

### Activity

- Sedentary work
- Driving
- Active job/on feet all-day
- Manual work
- Very heavy manual job/ladders etc

### Timescales

- 4–6 weeks as tolerated
  - 6–8 weeks, once good muscle control can control car
  - 2–3 months
  - 12 weeks/liaise with consultant
  - 3 months+
- 

## REFER BACK TO THE CLINIC

- Signs of infection
- Thrombosis
- Dislocation
- Persistent stiffness > 8/52

### Seen in the clinic at approximately

2/52, 6/52, 16/52, 1 year

