

Posterior Cruciate Ligament Reconstruction rehab

About the surgical procedure

The posterior cruciate ligament is an intraarticular ligament, and as such heals poorly. For this reason, it is almost always reconstructed with a substitute ligament, rather than being repaired.

In my practice the hamstring tendons are used most commonly, however if multiple ligaments need to be reconstructed as part of a severe ligamentous injury to the knee, other grafts may be used and include patella tendon, Quadriceps tendon, and donor (allograft) tendons.

At the time of surgery, the ruptured PCL is removed and the autologous hamstring graft is placed anatomically and held with screws and occasionally a staple.



Aims of Physiotherapy

Physiotherapy should ideally commence preoperatively. Patients who have a pain-free, mobile, healthy joint recover far quicker post operatively than those patients with acutely painful joints. It is ideal to learn the required exercises pre-operatively.

The treatment goals are:

1. Diminish post-operative pain and swelling
2. Restore full range of motion
3. Restore muscle tone and strength
4. Maintain and develop aerobic conditioning
5. Proprioceptive retraining allowing a safe return to work and sport as soon as possible



Brief Timeline:

Day 1

Begin physiotherapy

Day 10-14

Wounds usually healed enough to remain uncovered
Can start swimming (walking in pool etc)
Can usually return to work for “light duties” if available
Usually walking reasonably comfortably
Wear off crutches

Week 6

Can commence running in a straight line on the flat
Brace removed

Week 12

Commence sport specific training. Can start to jump.

Week 25 (6 months)

Return to contact sport



The Rehabilitation Program

Stage 1 Wound Healing phase

Day 1- Day 14 Aims

- Adequate pain relief
- Progressively stop using crutches
- Decrease leg and joint swelling
- Restore full extension
- Establish muscle control and aim for normal gait



Treatment Guidelines

- Weight bearing as tolerated, decreasing dependence on crutches
- Pain and swelling reduction techniques including:

Ice

Elevation

Co-contraction

Pressure pump

Biofeedback and selective muscle stimulation if necessary

- Range of motion exercises aiming for full extension at 14 days including:

Stationary bike- start with seat high, low resistance

Prone leg hangs

Patella mobilizations

Gait retraining with full extension at heel strike

Gentle hamstring stretching

Aim to achieve 0-70 degrees by 14 days



- Strengthening program including:

Static Quads co-contraction emphasising VMO control and various angles of knee flexion (up to 60 degrees) progressing to weight bearing positions.

Begin quad sets, straight leg raises, knee extension 70-0 degrees

- Balance and proprioception training

Single leg stance with eyes open / closed

Stage 2 Hamstrings and Quadriceps Control

Week 2- week 6 aims:

Obtain a 0-90 degrees ROM

Develop good muscle control and early proprioceptive skills

Maintain cardiovascular fitness



Treatment guidelines

- Use active and passive extension techniques to aim for full range of motion
- Passive knee flexion (prone)

Include hamstring stretching

- Can commence swimming once wounds healed (no whip kick)
- Gym equipment can be introduced once the effusion is decreasing

Stepper

Leg Press

Mini Trampoline

- Progress Co-contraction for muscle control

Increase reps / length of contraction

2 leg quarter squats

Lunges

Stepping

Elastic cords

- Avoid active hamstring contraction until 6 weeks



Stage 3 Proprioception

Weeks 6-12

Although the patient may feel good, it is important to note that the PCL graft complex is now at its weakest

Aims:

- Improve neuromuscular control and proprioception
- Continue working on cardio fitness
- Improve endurance capacity of muscles
- Improve patient confidence
- Regain full Range of Motion



Treatment Guidelines

- Progress with resistance on gym equipment

Leg press

Stairmaster

Treadmill power walking

- Progress with strength training

Progress co-contractions to dynamic:

Step lunges

Half squats

Wall squats

- Can commence active knee flexion to 70 degrees
- Can begin jogging in straight lines on the flat

Start cycling on a normal bicycle

Progress with proprioceptive work:

Lateral stepping

Slide board

Wobble board

Trampoline balance



Stage 4 Sport specific

Weeks 12-20 aims:

- Prepare to return to sport
- Incorporate more sport specific activities
- Introduce agility and reaction time into proprioceptive work
- Increase leg strength
- Develop patient confidence

Treatment Guidelines

- General strength work

Half squats with resistance

Leg press

Leg curls

Wall squats

Step work on progressively higher steps

Stepper and rowing machine



- Active knee flexion through full range

Can commence leg curls initially with low weight

- Sport specific:

Shuttle runs

Ball skills

Sideways running

Skipping rope

- Low impact step aerobics class
- Swimming can include using flippers



Stage 5 Return to sport

Months 5-6 (20-25 weeks) aims:

- Return to sport safely with confidence

Treatment Guidelines

- Continue with progression of plyometrics and sport specific drills

Zigzag running

Figure 8's gradually decreasing in size

Cross over stepping

Backwards with cutting

Stop and go drills

- Continue with power and endurance training
- Return to training in running shoes for skills exercises

Month 6

Return to contact sport if limb strength and neuromuscular control adequate. Strength usually 90% contralateral limb on Cybex testing if available



Possible Complications

Infection

The patient complains of a constant, severe pain. The patient may be sweaty, ill, have a temperature and often a tense effusion.

Post operative haemorrhage into the donor graft site

Results in a hot tender area over the posteromedial thigh. May be difficult to distinguish from infection. Knee motion is usually not restricted.

Hamstring strain or pain

Hamstring tears with the patient reporting a “pop” about the posteromedial thigh are common within the first 2 and even up to 6 weeks.

Deep Venous Thrombosis

The patient has calf, popliteal, thigh or groin pain and tenderness associated with swelling. Should have a venous duplex performed if this concern exists



Stiffness

May occur at any stage of the rehabilitation. The causes include:

Arthrofibrosis

Complex regional pain syndrome

Misplacement of the graft

Graft Failure

May occur at any stage, but usually between the 6-12 week mark

The graft may remain intact, but stretch

Patellofemoral irritability

Less common with hamstring reconstruction

If any concerns please contact the rooms, the private hospital, or the orthopaedic registrar through the public hospital ASAP.

