University Hospitals Coventry and Warwickshire NHS Trust

OSTEOCHONDRAL ALLOGRAFT RECONSTRUCTION OF THE KNEE

POST OPERATIVE REHABILITATION

This document will outline the rehabilitation approach to osteochondral allograft reconstruction. The approach to each patient may need to be personalised to account for patient specific variables and procedures such as osteotomy, meniscal transplant or ligament reconstruction.

Each phase below aims to steadily increase weight bearing and range of movement.

Phase I : Joint Recovery and Protection of Graft (0-6 Weeks):

PHASE 1 GOALS

- Incorporation of the transplanted graft
- Begin early range of movement exercises
- Control pain and swelling

Early protection of the osteochondral graft is important to allow integration of the new tissue to the patients' tissue.

To minimize stress on the healing osteochondral graft, weight bearing is strictly limited to non-weight bearing for the first 4 weeks. For the first two weeks (or until quadriceps control is gained as demonstrated by a lack of quad lag during straight leg raise), an extension brace is used to lock the knee in full extension when mobilising and overnight for the first two weeks. Partial weight bearing can commence from 4 weeks. Fully weight bearing can commence from 6 weeks.

The goal for movement is to gain 100° flexion by week 6. During the first 2 weeks postoperatively, quadriceps sets, straight leg raises, calf pumps, and passive leg hangs to 90° are performed at home to minimize muscle atrophy during this period. From 2-6 weeks passive ROM (PROM) and active ROM exercises are initiated as tolerated. Strengthening and mobilization are key during this phase, including gluteal sets, hamstring stretches and core strengthening. Manual patellar and tibiofibular joint mobilization are utilized to minimize scar tissue formation.



ICE TREATMENT



Ice treatment after your surgery is very important to keep the swelling of your knee under control. You should use an ice pack or Cryocuff on your knee for 15-20mins every two hours during the day for the first 7-10 days after your operation.

It is expected that your knee will continue to swell for up to 3 months after your surgery, hence icing regularly until 3-6 months post operatively is recommended.

Recurrent swelling indicates overload of the knee. Premature progression of rehabilitation should be avoided and guided by a physiotherapist.

Phase II (6- 8 Weeks): Joint Activation

PHASE 2 GOALS

- Progress towards full range of movement
- Progress towards full weight bearing
- Regain good muscle strength

Weight bearing is initiated with approximately 25% of total body weight and progressed by 25% weekly until full weight bearing is achieved. Patients can stand affected leg on bathroom scales to clarify percentage of weight. Aim to manage the knee to a 'quiet' state of minimal to no swelling, minimal to no redness and minimal to no warmth to touch compared to the opposite knee.

Until full weight bearing is achieved, exercise is limited to stationary bike with minimal resistance and continuation of exercises from Phase I with weight-bearing precautions. Range of movement is gradually increased aiming towards a goal of 130° of flexion. Exercise goals are focused on improving strength, flexibility and neuromuscular control. Cardiovascular training can begin on the stationary bike or hand cycle.

Phase III (8- 12 Weeks): Progressive Joint Loading

PHASE 3 GOALS

- Restore good flexibility
- Restore symmetry of strength
- Improve neuromuscular control

Patients should progress to full and pain-free active and passive range of movement during this phase. Gait training is initiated to improve neuromuscular control.

Soft tissue mobilisation of the iliotibial band, patella and quadriceps tendons and popliteal space are beneficial at this stage to promote flexibility of tissues and reduce joint stiffness.

Closed chain (where the foot is fixed in one position) strengthening exercises, including bridging, leg press, mini squats and toe raises.

Proprioception through single leg balance exercises can commence from stable to unstable surfaces.





Phase IV (12 Weeks- 6 Months): Activity Restoration

PHASE 4 GOALS

- Normalisation of activities of daily living
- Advancing proprioception
- Advanced strengthening of lower limb and core

Neuromuscular dynamic stability exercises should focus primarily on single-leg exercises, balancing on wobble boards and BOSU and comparing to the contralateral lower extremity for symmetry.



Patients should achieve quadriceps and hamstring strength within 10% of contralateral, healthy leg before progressing to the next stage. This includes symmetric external weight load when performing movements such as single-leg lunges with weights. Patients may advance to single-leg curls and extensions between 14 and 16 weeks. Joint locking should be avoided. **Full advancement to running is not recommended for osteochondral allograft until 8 months.**

Phase V (6- 12 Months): Return to Sport

PHASE 5 GOALS

- Sport specific agility training
- Education and preparation for return to play
- Advanced strengthening and flexibility

Sport-specific activities are emphasized and base line testing, specifically evaluating the strength of the legs should be conducted to determine deficits and assessing for risk factors for injury. Sport-specific coordination drills and strengthening are focussed. After these are achieved, athletes may progress to more explosive, high-demand activities such as plyometrics and change of direction exercises. **Patients who have undergone uncomplicated, isolated surgery are typically cleared to return to train after the 6-8 month time point.**.

Special Considerations: Additional Procedures:

With additional procedures, rehabilitation becomes a more prolonged process which will be guided on an individual case basis by the operating surgeon.

Version History

Version 1.1: Draft by Laura Asplin and Ciara Stevenson. May 2018
Approved by Tim Spalding May 2018

Version 1.2: Amended update by Laura Asplin, Tim Spalding. June 2018

Rehabilitation for Osteochondral allograft transplantation of the knee- Summary table

Phase	**Weight bearing**	**Brace**	**Range of movement**	**Exercises**
Phase I ***Joint Recovery and Protection of Graft*** (0- 6 weeks)	Non weight bearing	0-2 weeks. Locked in full extension when mobilising and at night. Off for exercises only. Discontinue night use after 2 weeks	Aim 100 flexion degrees by 6 weeks	0-2 weeks: Static quads, Straight Leg Raise (IN BRACE), calf pumps, passive leg hangs to 90° at home Free passive and active bending to 90 degrees 2-6weeks: Passive ROM/Active Assisted ROM to tolerance, patella and tibio-fibular joint mobs ,quad, hamstring, and glute sets, SLR, side-lying hip and core
Phase II ***Joint Activation*** (6- 8 weeks)	Advance 25% weekly until full	None	Full	Advance Phase I exercises
Phase III ***Progressive Joint Loading*** (8- 12 weeks)	Full	None	Full	Gait training, begin closed chain activities. Begin unilateral stance activities, balance training
Phase IV ***Activity Restoration*** (12 weeks- 6 months)	Full	None	Full	Advance Phase III exercises; maximize core/ glutes, pelvic stability work, eccentric hamstrings. May advance to elliptical, bike, and pool as tolerated
Phase V ***Return to Sport*** (6- 12 months)	Full	None	Full	Advance functional activity. Return to sport- specific activity and impact when cleared by surgeon after 8 months

Cotter EJ, Frank RM, Wang KC, Cole BJ. (2017) Rehabilitation and Return to Play Following Osteochondral Allograft Transplantation in the Knee. Oper Tech Sports Med 25: 208-213

PAGE FOR COMMENTS AND ADDITIONS