

Autologous Osteochondral Bone Grafting (Mosaicplasty)

Introduction

Surgery: Grafting for cartilage defects of femoral condyles or patello-femoral articulation. Grafts taken from the non-weight bearing surface of the intercondylar notch or the non weight bearing surface of the outer aspect of medial/lateral condyles above the level of the notch. The cartilage defect is drilled and filled with grafts without any cement. Femoral condyle grafting is either arthroscopic or combined arthroscopic and arthrotomy. Patello-femoral grafting is always through arthrotomy.

Indications for surgery: Pain, swelling and mechanical symptoms. These defects can be traumatic, idiopathic, associated with Anterior Cruciate Ligament (ACL) deficient knees or osteochondritis dissecans (OCD).

Expected Length of Stay: Day case

Surgeons: Mr Keating, Mr Lawson, Mr Murray

Scope of practice

These guidelines are designed to guide physiotherapists when treating patients following a Mosaicplasty. These guidelines were produced by a process of systematic review of the current evidence-based literature, medical and peer consultation. They were correct at the time of writing. The guidelines should be used in conjunction with the clinical reasoning skills of the physiotherapist and patients should always be treated on a case-by-case basis.

Aim

The aim of these guidelines is to provide physiotherapy staff with a series of recommendations from the current evidence base to assist them in the management of patients who have undergone a Mosaicplasty.

Literature review question

What is a safe and effective rehabilitation programme for patients undergoing a Mosaicplasty to maximise outcome and return to full activity/sport?

Search Process

Appraisal process: Literature searches using key words were performed on the databases listed below. No articles comparing postoperative management strategies were found but key articles with descriptors of the surgery and rehabilitation were included for information. Of note there are two active trials that are comparing Mosaicplasty to other treatments at the time of update which are not currently published.

Total number of articles selected: 24

Total number of articles discarded: 21

CASPs used: n/a

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Data Bases:

Data Base	Dates	Limitations
Medline	Unlimited	None
Cochrane	Unlimited	None
Google	Unlimited	None
Amed	Unlimited	None
Cinahl	Unlimited	None
Embase	Unlimited	None
Sports Discuss	Unlimited	None
Joanna Briggs	Unlimited	None
NHS QIS	Unlimited	None

Key Words:

Mosaicplasty	Post-operative rehabilitation
Osteochondral Autologous Transplantation	Weight-bearing
OATS	Trochlear
Knee surgery	Articular cartilage
Quadriceps exercises	Knee mobilisation
Physiotherapy	

Results

The literature review revealed no RCT's on physiotherapy management following a Mosaicplasty. Therefore, at the time of writing this, no individual article answered the review question in its entirety. In the available literature there is variation in the post-operative management following a Mosaicplasty. These guidelines therefore reflect current practice and expert opinion and have been developed in consultation with the Orthopaedic Consultants at the Royal Infirmary of Edinburgh.

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Key Points

- ***Please note there are slightly different protocols depending on the anatomical site of grafting.***
- Timescales are approximate and rehabilitation should be guided, at each stage, by minimal swelling, resolution of pain and good muscle recruitment.
- Commonly cited criteria for progression includes restoring gait, quadriceps strength, co-ordination, sport specific skills performance.
- Patients are usually non-weight bearing (NWB) for the first 6 weeks (Mr Keating's patients can begin partial weight bearing (PWB) at 4 weeks and progress to fully weight bearing (FWB) at 6 weeks)
- The mean time of return to sport was reported to range from 5 to 12 months, with 50-80% return to same level and 75-100% from 6 months to 2 years.
- The use of two functional outcome measures along with isokinetic testing is the ideal outcome assessment but isokinetic assessment alone does not reflect functional improvement.

Femoral Condyles

Phase 1 - Immediate Post Operative/Early Rehabilitation: 0-6 weeks

Goals	Recommendations	
Reduce post-surgical inflammation	Ice 20 minutes, 2 hourly Compress when active Elevate when resting	A1 C
Protect Graft Site	NWB (Mr Keating's patients can PWB at 4 weeks and progress to FWB at 6 weeks, unless otherwise stipulated in post op instructions)	C
Increase knee range of movement (ROM)	Passive/Active-assisted/Active knee flexion & extension	C
Commence quadriceps muscle strengthening	NWB strengthening exercises/open chain quadriceps	C

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Patello-femoral

Phase 1 - Immediate Post Operative/Early Rehabilitation: 0-6 weeks

Goals	Recommendations	
Reduce post-surgical inflammation	Ice 20 minutes, 2 hourly Compress when active Elevate when resting	A1 C
Protect Graft Site	NWB (Mr Keating's patients can PWB at 4 weeks and progress to FWB at 6 weeks, unless otherwise stipulated in post op instructions) No active (open or closed chain) quadriceps exercises No active range of movement (AROM) exercises over the edge of bed or on a chair (i.e. through range quad) due to increased patellofemoral joint forces	C
Increase knee range of movement (ROM)	Knee flexion/extension on sliding board or prone knee bend only	C
Commence quadriceps muscle strengthening	Static quadriceps contraction only Hamstring strengthening allowed	C

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Femoral Condyles and Patello-femoral

Phase 2 - Middle stage: 6-12 weeks

Goals	Recommendations	
Full range of movement	AROM exercises at the Knee	C
Restore normal gait	Gait re-education as required (FWB allowed)	C
Regain functional lower limb strength	Open and closed chain quadriceps exercises As required, include strengthening work for other affected muscle groups (i.e. Gluts, Hamstrings, Gastroc/Soleus)	C
Increase neuromuscular control and stability	Single leg balance exercise and dynamic stability work (as weight bearing allows)	C

Phase 3 - Late stage: 12 wks– 2years

Goals	Recommendations	
Return to full sport/activity	Sport specific and Plyometric rehabilitation Ensure full ROM, control and strength before commencing sport specific/plyometric exercises Consider use of Lower symmetry index and/or use of appropriate functional outcome tools.	C

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Criteria for returning to sport:

Low impact sports 3-4 months depending on symptoms and progress	C
High impact sports 4-6 months depending on symptoms and progress	C
Non-irritable knee with full ROM	C
Objective measures of ROM, strength and dynamic balance should be recorded	C

Potential complications:

Infection
Femoral condyle fracture
Knee stiffness
Dislodging of grafts (loose bodies)
Failure to relieve pain
Patello-femoral pain

If clear signs of complications, refer back to surgeon

Expectations of Surgery:

Pain relief
Full ROM
Return to normal activities/sport

Contact details for further information/advice:

Royal Infirmary of Edinburgh, Outpatient Physiotherapy Department: 0131 242 1940

Western General Hospital, Outpatient Physiotherapy Department: 0131 537 1288

St John's Hospital, Outpatient Physiotherapy Department: 01506 522063

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Disclaimer: This information should be used in conjunction with treatment from an appropriate physiotherapist and not in isolation.

Appendix

Levels of Evidence

Evidence from large randomised controlled trials (RCTs) or systematic review (including meta-analyses)† A1

Evidence from at least one high quality cohort A2

Evidence from at least one moderate size RCT or systematic review A3

Evidence from at least one RCT B

Expert opinions C

Laboratory Evidence* D

† *Arbitrarily, the following cut-off points have been used: large study size _ 50 patients per intervention group; moderate study size _ 30 patients per intervention group.*

* *Arbitrarily, added by Lothian Physiotherapy Musculoskeletal Network Group*

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