

In the adult population undergoing surgical arthroscopic treatment for knee articular chondral defect, is the use of CPM (continuous passive motion) effective in reducing pain and improving function?

Clinical Bottom Line

There is no current robust evidence to support the use of CPM following arthroscopic treatment for chondral defects of the knee.

The use of CPM to provide regular movement on the knee is mentioned in several articles and studies, but seems to have been based originally on a study of cartilage repair in animals.

However all of the literature that reported on rehabilitation following this particular surgical procedure suggests that regular movement of the knee and protected weight bearing (PWB) especially in the first 6 weeks are two important issues in successful outcome.

Criteria for Critically Appraised Topic

Population: adults undergoing arthroscopic treatment for knee chondral defects

Intervention: Continuous passive movement post operatively

Comparison: non CPM (active exercise)

Outcomes: reduced pain and increased function

Exclusions: patients undergoing arthroscopy with no chondral defect pathology, TKR, knee MUA

Data bases Searched: Cochrane, Pedro, NHS Library for Health, Medline, Cinahl, Embase, Clinical Evidence, Bandolier, Professional websites, Guidelines, NICE, sports discus, rehabdata

Search for the past 10 years i.e. 1998 – 2008

Key words searched

Adult, knee, arthroscopy, endoscopy, surgery, chondral defect, articular cartilage, microfracture, OATS, mosaicplasty, drilling, debridement, continuous passive movement, post-operation, post-operative, rehabilitation, physiotherapy, outcome measure, pain, function

Types of study included: RCT, systematic reviews, cohort studies, review articles

Databases Searched and available evidence

Database (Specific to our CAT)	Number of abstracts	Number of relevant abstracts
Clinical evidence		
AMED		
CINAHL	33	4
Embase	2	1
Bandolier		
PEDRO		
Medline	12	5
Cochrane		
Total	47	10

Results:

There was one study (Marder et al 2005) who looked at comparing two groups of knee arthroscopy patients, one that had CPM and the other group didn't. Unfortunately they also compared normal weight bearing in the non CPM group and protected weigh bearing in the CPM group, so there were two treatment variables.

This was a retrospective review of patients undergoing arthroscopic microfracture with a small sample size of 43 – it was unclear regards to any randomisation or blinding of the sample groups.

There was no baseline demographic or pre-operative score data for each group.

The CPM input was one cycle per minute for 6-8 hours a day for six weeks. Outcome measures were the Lysholm and Tegner knee scores – neither of which changed with statistical significance.

Their results stated that that the use of CPM and PWB did not confer any improvements in the clinical results of the study.

Alfredson and Laurentzon 1999, present a retrospective study showing “superior results of CPM compared to active motion after periosteal transplantation of patella cartilage defects”

This involved reviewing 57 patients undergoing this procedure – 38 had CPM and 19 had active movement for the first 7 days post-op and both with PWB for eight weeks. It was unclear regards randomisation and blinding to group allocation.

Outcomes were based on a Brittberg symptom score (unreferenced) and MRI performed on 18 patients in the CPM group and non in the active exercise group. Length of follow-up was also different for each group, longer for the CPM group.

They state that the results showed better outcome for those that had the immediate CPM.

This study related to specific patella defects, but the inconsistencies in sample size, outcomes and follow up, and the lack of expected methodological processes would potentially undermine the results.

Steadman et al 2003 summarises an 11 year follow-up of arthroscopic microfracture patients.

They state their post-operative regime of PWB for all patients and CPM at one cycle per minute for 6-8 hours a day for 6-8 weeks (or 1500 daily repetitions of passive knee flexion if CPM not available). He does not justify or evidence base this particular post-op protocol.

The other articles critiqued were review articles on surgical procedures for chondral defects and post-operative rehabilitation – no systematic review or prospective RCT's were found.

Implications for practice

Common practice in most of the articles supported the use of CPM for 6-8 hours a day for 6-8 weeks and one cycle per minute or regular daily active knee flexion if CPM not available.

Locally most patients undergoing arthroscopic chondral defect treatment will be treated as a day case procedure. Applying CPM in hospital before they are discharged is possible using the machines we have for inpatient use only. They could be shown how to use the machine and to know what it should feel like.

However, the continuing use of a CPM machine at home for **8 hours every day for 6-8 weeks** will incur costs of either buying or renting CPM machines. Also there was no mention within any study relating to compliance of use of the CPM at home which could have a huge implication to outcome.

After reviewing the available literature we cannot support the use of CPM post-operatively as part of the rehabilitation process for adults undergoing arthroscopic chondral defect treatment.

However, a further question arises as to whether we should support the use of PWB for 6 weeks to allow protection and healing of the treated lesion.

References

Steadman R et al 2003 Outcomes of microfracture for traumatic chondral defects of the knee: average 11 year follow-up. Journal of Arthroscopic and Related Surgery 19 (5): 477-484

Alfredson H, Lorentzon R 1999 Superior results with CPM compared to active motion after periosteal transplantation Knee Surg Sports Traumatology Arthroscopy 7: 232-238

Marder R et al 2005 Arthroscopic microfracture of chondral defects of the knee. A comparison of two post-operative treatments. Journal of Arthroscopic and Related Surgery 21 (2): 152-158

Reinold M et al 2006 Current concepts in the rehabilitation following articular cartilage repair procedures in the knee. Journal of Orthopaedic and Sports Physical Therapy 36 (10): 774-794

Natfulin S, Niergarth S 1995 Continuous Passive Motion. Physical Medicine and rehabilitation 9 (1):51-65

Gobbi A et al 2005 Treatment of full thickness chondral lesions of the knee with microfracture in a group of athletes. Knee Surg Sports Traumatology Arthroscopy 13: 213-221

Irrang J, Pezzullo D 1998 Rehabilitation following surgical procedures to address articular cartilage lesions in the knee. Journal of Orthopaedic and Sports Physical Therapy 28 (4): 232-240

Sledge S 2001 Microfracture techniques in the treatment of osteochondral injuries. Clinics in Sports Medicine 20(2): 365-377

Gill T 2006 The treatment of articular cartilage defects using the microfracture technique. Journal of Orthopaedic and Sports Physical Therapy 36(10): 728 – 738