A systematic review investigating the early rehabilitation of patients following medial patellofemoral ligament reconstruction for patellar instability

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CRD summary
The authors concluded that there was insufficient evidence to draw firm conclusions about the optimal post-operative rehabilitation regimen for patients who had undergone medial patellofemoral ligament reconstruction for patellar instability, and further good-quality research was required. Although there were some limitations to this review, the authors’ conclusions reflect the limited evidence from small and diverse observational studies.

Authors' objectives
To determine the optimal method of early rehabilitation of patients who had undergone medial patellofemoral ligament (MPFL) reconstruction for patellar instability. The review sought to answer three questions:

1. What is the optimal post-operative weight-bearing status for medial patellofemoral ligament reconstruction patients?
2. Should rehabilitation for medial patellofemoral ligament reconstruction patients include knee braces?
3. When should post-operative exercise start and what type of exercise should be advised?

Searching
AMED, British Nursing Index, CINAHL, the Cochrane Library, EMBASE, MEDLINE, PubMed, PEDro, PsycINFO and Zetoc were searched from inception to May 2007; the search terms were reported. Reference lists in identified studies and four named relevant journals (inception to May 2007) were also searched. Abstract and conference proceedings were excluded. Only articles published in English were eligible.

Study selection
Study designs of evaluations included in the review
Single-subject case reports were excluded. All of the included studies were case series.

Specific interventions included in the review
Studies that evaluated rehabilitation regimens were eligible for inclusion. Studies had to report post-operative weight-bearing status, whether or not a knee brace was worn, and when the patients began exercising. Studies that compared open medial patellofemoral ligament repairs with reconstruction were excluded. None of the included studies provided full details of the rehabilitation programmes.

Participants included in the review
Studies of patients who had undergone open or arthroscopic, allograft or autograft medial patellofemoral ligament reconstructions for patellar instability, with or without secondary surgery, were eligible for inclusion. Studies had to report the patient’s history and the reasons for surgery. In the included studies, most (68%) of the patients were female and the mean age was 24 years (range: 6 to 52). The most common reasons for medial patellofemoral ligament reconstruction were failure of conservative treatment, recurrent or persistent instability, and positive apprehension test. Where reported, the time from primary dislocation to surgery ranged from 7 days to 37 years. Most of the included studies used a semitendinosis graft; other studies used a variety of specified types of graft. A minority of the studies reported various types of secondary surgery including tibial tuberosity transfer, lateral release and vastus medialis advancement, either alone or in various combinations.

Outcomes assessed in the review
Inclusion criteria were not specified in terms of the outcomes. The included studies assessed a variety of outcomes including patellar apprehension, recurrence of dislocation or subluxation, various scoring systems, other clinical measures and radiological measures (details were reported).

How were decisions on the relevance of primary studies made?
Three reviewers independently selected the studies. Any disagreements were resolved by consensus.

**Assessment of study quality**
Three reviewers independently assessed validity using criteria developed by the Critical Appraisal Programme. The criteria related to study validity, study quality, presentation of the results and generalisability (details were reported). Any disagreements were resolved by consensus.

**Data extraction**
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

**Methods of synthesis**
How were the studies combined?
The studies were grouped according to the review question and combined in a narrative.

How were differences between studies investigated?
Differences between the studies were discussed in the text.

**Results of the review**
Eight case series were included (174 patients who had undergone 186 medial patellofemoral ligament reconstructions). The sample size ranged from 12 to 43 patients.

Methodological problems included: lack of a defined research question; lack of description of patient characteristics and selection methods; lack of adjustment for confounding factors; lack of reporting of statistical differences between patients at baseline; lack of clear reporting of the use of valid and reliable outcome measures; reporting of results without measures of variance; small sample size; lack of description of the full rehabilitation programme (none of the studies described their full rehabilitation programme); and use of additional knee surgery. All of the studies did, however, follow-up patients for an adequate time period. In six studies the follow-up rates were over 80%.

1. What is the optimal post-operative weight-bearing status for medial patellofemoral ligament reconstruction patients?

   There appeared to be no marked differences in patellar apprehension, recurrence of dislocation or subluxation, Kujala score or radiological outcomes between studies that allowed immediate full weight-bearing (two studies) compared with non weight-bearing (five studies) or partial weight-bearing (one study).

2. Should rehabilitation for medial patellofemoral ligament reconstruction patients include knee braces?

   There appeared to be no marked differences in clinical and radiological outcomes between studies that used knee braces post-operatively (seven studies) and the one study that did not use a knee brace, or between studies that did not use knee braces (one study) or used them for a relatively short time period (one study immobilised knees using a knee brace for three days then changed to patellar brace) compared with studies that immobilised knees using knee braces for a longer period (five studies).

3. When should post-operative exercise start and what type of exercise should be advised?

   There appeared to be no marked differences between: studies that used immediate post-operative exercises (five studies) compared with delayed exercises (three studies started exercises at five days to three weeks post-operatively); studies that used continuous passive movement (three studies) compared with those that did not; or studies that included quadriceps exercises in early rehabilitation (three studies included quadriceps exercises/straight leg raising immediately post-operatively) and those that did not (three studies).

**Authors’ conclusions**
There was insufficient evidence to draw firm conclusions about the optimal post-operative rehabilitation regimen for patients who had undergone medial patellofemoral ligament reconstruction for patellar instability. Further good-quality
research was required.

**CRD commentary**
The review addressed a clear question that was defined for the participants and intervention. Inclusion criteria were broad for the study design and not defined for the outcomes. Several relevant sources were searched but no attempts were made to minimise publication or language bias; the review authors acknowledged these limitations. Methods were used to minimise reviewer error and bias in the study selection and validity assessment processes, but it was not clear whether similar steps were taken at the data extraction stage.

The results of the quality assessment of included studies were reported in detail and discussed. In view of the diversity amongst the studies, a narrative synthesis that took account of the methodological limitations of the included studies was appropriate.

Although there were some limitations to this review, the authors' conclusions reflect the limited evidence from small and diverse observational studies.

**Implications of the review for practice and research**

**Practice**: The authors did not state any implications for practice.

**Research**: The authors stated the need for well-designed randomised controlled trials to evaluate the effects on a variety of outcomes (including radiological, functional and quality-of-life measures) of different weight-bearing regimens, immobilisation and exercise regimens in patients following medial patellofemoral ligament reconstruction. Studies should also assess differences in the outcomes between patients with a short and a long time interval between primary dislocation and medial patellofemoral ligament reconstruction.

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