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Cochrane in CORR®: Surgical Versus Non-surgical Interventions for Treating Patellar Dislocation (Review)

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Importance of the Topic

Acute patellar dislocations account for 2% to 3% of all knee injuries and have an estimated incidence of 5.8 per 100,000 patients per year [3, 5, 9]. Patellar dislocations commonly result in injuries to the soft-tissue structures on the medial aspect of the knee, particularly the medial patellofemoral ligament

(MPFL), which can predispose patients to recurrent instability [3]. Patellar dislocations primarily affect young, physically active individuals, and recurrent instability can cause substantial morbidity [7]. Repetitive injury can lead to pain, inability to return to sports, decreased quality-of-life, early degenerative changes, and osteoarthritis [2].

The ideal treatment for primary patellar dislocations is controversial.

Primary patellar dislocations generally are treated nonoperatively with physical therapy and/or bracing, but redislocation occurs in 15% to 44% of patients treated with nonoperative management. Therefore, several studies have compared clinical outcomes between surgical and nonsurgical treatment options [3]. Rigorous assessment of available evidence can inform clinicians regarding ideal treatment options for patients. This

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Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and The Cochrane Library (<http://www.thecochranelibrary.com>) should be consulted for the most recent version of the review.

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systematic review and meta-analysis presented findings on all randomized and quasi-randomized controlled trials (n = five trials; 344 patients) of surgical versus nonsurgical management for patients with primary lateral patellar dislocations.

Upon Closer Inspection

All of the included trials enrolled participants who had sustained a primary patellar dislocation as diagnosed by clinical examination. Nonsurgical management in all trials differed and consisted of initial immobilization in a cast or splint for a variable duration of time followed by active mobilization with variable physiotherapy regimens. There is considerable disagreement about the best nonoperative treatment approaches, and further research into identification of an ideal nonoperative management strategy has been previously recommended [8].

There was also variability in the reported surgical techniques across the included trials. Most techniques generally included repair or reconstruction of the soft tissue structures in the medial aspect of the knee, but

specific techniques included MPFL suture repair, medial soft-tissue reefing with MPFL augmentation, combinations with lateral release, and MPFL reconstruction. Another systematic review addressing this topic found that the rationale for undertaking particular techniques rarely were reported despite considerable variability in surgical technique across studies in that review [8]. Additionally, anatomic considerations and diagnostic evaluation of associated conditions such as trochlear hypoplasia or generalized soft-tissue laxity were unreported, which prevents assessment of optimal techniques in specific patient populations.

Differential surgical expertise is a potential source of bias in surgical and nonpharmacologic trials [4, 6]. None of the included trials controlled for expertise in the surgical or nonsurgical treatment arms, so the expertise with which the interventions were administered could have varied across study groups. Expertise-based trials can minimize differential expertise bias by randomizing patients between clinicians with defined expertise in their procedure of choice [4].

Take-home Messages

This systematic review and meta-analysis found decreased risk of recurrent patellar dislocation and improved health-related quality-of-life scores following operative treatment of primary patellar dislocations at 2 to 5 years followup, but the quality of the evidence for all outcomes was graded low due to serious risk of bias from study limitations and imprecision in effect estimates. According to the Grading of Recommendations, Assessment, Development and Evaluation approach, low-quality evidence indicates that we have little confidence in the effect estimate and the true effect is likely to be substantially different from the estimate of effect itself [1]. Given a current lack of compelling data towards either operative or nonsurgical treatment, surgeon experience as well as individual patient values and preferences should primarily guide management.

Future research is required to compare specific nonoperative approaches and operative techniques, including consideration of specific risk factors for subsequent dislocation to provide clinicians' managing this condition with critical information to inform treatment decisions.

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Appendix



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Surgical versus non-surgical interventions for treating patellar dislocation (Review)

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[Intervention Review]

Surgical versus non-surgical interventions for treating patellar dislocation

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ABSTRACT

Background

Patellar dislocation occurs when the patella disengages completely from the trochlear (femoral) groove. Following reduction of the dislocation, conservative (non-surgical) rehabilitation with physiotherapy may be used. Since recurrence of dislocation is common, some surgeons have advocated surgical intervention rather than non-surgical interventions. This is an update of a Cochrane review first published in 2011.

Objectives

To assess the effects (benefits and harms) of surgical versus non-surgical interventions for treating people with primary or recurrent patellar dislocation.

Search methods

We searched the Cochrane Bone, Joint and Muscle Trauma Group's Specialised Register, the Cochrane Central Register of Controlled Trials (*The Cochrane Library*), MEDLINE, EMBASE, AMED, CINAHL, ZETOC, Physiotherapy Evidence Database (PEDro) and a variety of other literature databases and trial registries. Corresponding authors were contacted to identify additional studies. The last search was carried out in October 2014.

Selection criteria

We included randomised and quasi-randomised controlled clinical trials evaluating surgical versus non-surgical interventions for treating lateral patellar dislocation.

Data collection and analysis

Two review authors independently examined titles and abstracts of each identified study to assess study eligibility, extract data and assess risk of bias. The primary outcomes we assessed were the frequency of recurrent dislocation, and validated patient-rated knee or physical function scores. We calculated risk ratios (RR) for dichotomous outcomes and mean differences (MD) for continuous outcomes. When appropriate, we pooled data.

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Main results

We included five randomised studies and one quasi-randomised study. These recruited a total of 344 people with primary (first-time) patellar dislocation. The mean ages in the individual studies ranged from 19.3 to 25.7 years, with four studies including children, mainly adolescents, as well as adults. Follow-up for the full study populations ranged from two to nine years across the six studies. The quality of the evidence is very low as assessed by GRADE (Grading of Recommendations Assessment, Development and Evaluation Working Group) criteria, with all studies being at high risk of performance and detection biases, relating to the lack of blinding.

There was very low quality but consistent evidence that participants managed surgically had a significantly lower risk of recurrent dislocation following primary patellar dislocation at two to five years follow-up (21/162 versus 32/136; RR 0.53 favouring surgery, 95% confidence interval (CI) 0.33 to 0.87; five studies, 294 participants). Based on an illustrative risk of recurrent dislocation in 222 people per 1000 in the non-surgical group, these data equate to 104 fewer (95% CI 149 fewer to 28 fewer) people per 1000 having recurrent dislocation after surgery. Similarly, there is evidence of a lower risk of recurrent dislocation after surgery at six to nine years (RR 0.67 favouring surgery, 95% CI 0.42 to 1.08; two studies, 165 participants), but a small increase cannot be ruled out. Based on an illustrative risk of recurrent dislocation in 336 people per 1000 in the non-surgical group, these data equate to 110 fewer (95% CI 195 fewer to 27 more) people per 1000 having recurrent dislocation after surgery.

The very low quality evidence available from single trials only for four validated patient-rated knee and physical function scores (the Tegner activity scale, KOOS, Lysholm and Hughston VAS (visual analogue scale) score) did not show significant differences between the two treatment groups.

The results for the Kujala patellofemoral disorders score (0 to 100; best outcome) differed in direction of effect at two to five years follow-up, which favoured the surgery group (MD 13.93 points higher, 95% CI 5.33 points higher to 22.53 points higher; four studies, 171 participants) and the six to nine years follow-up, which favoured the non-surgical treatment group (MD 3.25 points lower, 95% CI 10.61 points lower to 4.11 points higher; two studies, 167 participants). However, only the two to five years follow-up included the clear possibility of a clinically important effect (putative minimal clinically important difference for this outcome is 10 points).

Adverse effects of treatment were reported in one trial only; all four major complications were attributed to the surgical treatment group. Slightly more people in the surgery group had subsequent surgery six to nine years after their primary dislocation (20/87 versus 16/78; RR 1.06, 95% CI 0.59 to 1.89, two studies, 165 participants). Based on an illustrative risk of subsequent surgery in 186 people per 1000 in the non-surgical group, these data equate to 11 more (95% CI 76 fewer to 171 more) people per 1000 having subsequent surgery after primary surgery.

Authors' conclusions

Although there is some evidence to support surgical over non-surgical management of primary patellar dislocation in the short term, the quality of this evidence is very low because of the high risk of bias and the imprecision in the effect estimates. We are therefore very uncertain about the estimate of effect. No trials examined people with recurrent patellar dislocation. Adequately powered, multi-centre, randomised controlled trials, conducted and reported to contemporary standards, are needed. To inform the design and conduct of these trials, expert consensus should be achieved on the minimal description of both surgical and non-surgical interventions, and the anatomical or pathological variations that may be relevant to both choice of these interventions and the natural history of patellar instability. Furthermore, well-designed studies recording adverse events and long-term outcomes are needed.

PLAIN LANGUAGE SUMMARY

Surgical versus non-surgical treatment after kneecap dislocation

Background

The patella or kneecap is a lens-shaped bone situated at the front of the knee. It is incorporated into the tendon of the quadriceps muscles of the thigh and moves within a groove at the lower end of the thigh bone (femur). Patellar dislocation occurs when the patella completely moves out of this groove. It typically occurs in young and physically active people with minimal trauma when they twist the bent knee with the foot fixed to the ground, for example, during sporting activities. The most common recurrent symptom reported by people is patella or knee cap instability. It may be associated with abnormal shape of the knee joint bones, weakness of the muscles around the hip or knees or tightness of soft tissues on the outside of the knee.

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When the patella dislocates, injury to the soft tissues of the knee joint occurs, which requires a period of rehabilitation. This may include treatments such as immobilisation and bracing (to limit knee movement), exercises, manual therapy, taping and electrotherapy modalities such as therapeutic ultrasound or electrical stimulation. However, some surgeons have suggested that people may have a better outcome if surgery is performed to repair or reconstruct the injured ligaments and muscles, re-shape the lower femur or change the position of where the patella attaches to the shinbone (tibia) to restrain the kneecap from dislocating again.

Results of the search and description of studies

This is an update of a previous Cochrane review. We searched the medical literature until October 2014 and we found six relevant studies (344 participants) that looked at the results of surgery compared with non-surgical treatment for people who had a kneecap dislocation. The studies allocated people to a surgical or non-surgical treatment group randomly. All study participants were being treated for a first-time dislocation. The mean ages in the individual studies ranged from 19 to 26 years, with four studies including children, mainly adolescents, as well as adults. Follow-up for study participants in the six included studies ranged from two to nine years.

Key results

The review found evidence of lower risk of repeated knee cap dislocation for those who underwent surgery compared with non-surgical intervention following first-time dislocation at two to five years follow-up. There was weaker evidence of a lower risk at six to nine years follow-up and an increased risk after surgery could not be ruled out. Very limited evidence for patient-rated knee and physical function outcome measures did not show a difference between the two groups. Although, evidence for an outcome measure that was specific to kneecap disorders was in favour of surgery at two to five years follow-up, the evidence at six to nine years follow-up did not show a benefit of surgery and tended to favour non-surgical treatment. One study only reported on adverse effects of treatment. This reported four major complications after surgery. Although slightly more people in the surgery group had subsequent surgery at six to nine years, the evidence for this outcome was inconclusive.

Quality of the evidence

These studies were small and had some weaknesses in their design and conduct. Overall, the quality of the evidence is very low and thus we were very uncertain about these findings.

Conclusions

Our review concludes that the evidence is not of sufficient quality to confirm a significant difference in outcome between surgical or non-surgical initial management of people who have dislocated their kneecap for the first time. There were no studies of people with recurrent patellar dislocation. Good quality research studies that are based on expert consensus about the condition and interventions and that involve a large number of people are required.

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