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Management of the first-time lateral patellar dislocation

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ABSTRACT

Background: Little guidance exists on the management of the first-time patellar dislocation. The aim of this article was to review current guidance for management of this condition.
Methods: Recent meta-analyses, systematic reviews and current consensus documents relating to first-time patellar dislocation were sourced. An instructional lecture was then created and delivered at the acute knee injuries session at the British Orthopaedic Association 2019 annual conference, which was presented on behalf of the British Association for Surgery of the Knee. This article has been written based on this lecture.
Results: There is a paucity of literature relating to management of the first-time patellar dislocation. Many studies are of poor design, with inadequate follow-up, making it difficult to draw conclusions from them. However, based upon available information and consensus from working groups it is recommended that patients presenting with first-time dislocation should be assessed to ensure they have not sustained an alternative or associated injury that may require surgical intervention, be assessed and counselled for the risk of recurrent dislocation, and be referred for initial conservative treatment. Surgical stabilisation should be reserved for patients with recurrent instability.
Conclusions: Most patients with a first-time patellar dislocation can be managed conservatively, having excluded associated injuries. Due to the poor quality of the literature, care must be taken interpreting the results of studies. It is clear that further research is required in this field.

1. Aetiology

Lateral patellar dislocation represents two to three percent of all knee injuries. It occurs most commonly in the 2nd decade with an incidence of 29–43 per 100,000 falling to nine per 100,000 in the 3rd decade. It is commoner in females and has a high recurrence rate. It can be associated with other injuries within the knee [1].

Dislocation occurs often without contact during sport, usually as a rotational injury with a valgus force in a flexed knee, which may be associated with a direct blow. It can occur with lesser injuries in the presence of developmental abnormalities [2,3]. There is a range of redislocation rates described between 10 and 50% [4], with most articles quoting rates of around 1/3 patients going on to have recurrent problems. There is an increased risk of recurrence in those less than 18 years old, in females, those with a

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Table 1
Anatomical abnormalities associated with recurrent patellar dislocation.

Trochlear dysplasia
Lateralised tibial tuberosity
Patella alta
Rotational malalignment within femur and/or tibia
Lateral femoral condylar (LFC) hypoplasia

history of contralateral dislocation, those with a family history of dislocation, and those with developmental abnormalities [5,6]. These factors are often interlinked.

The developmental abnormalities fall into two categories those related to bony anatomy and those related to the soft tissues. Anatomical abnormalities may consist of one or more components within the knee, Table 1. Such cases have been found to be genetically associated [7]. Each abnormality can be expressed to varying degrees and can be different even between knees within a patient. Abnormal soft tissues may be present concurrently or independently of anatomical abnormalities. They may simply lie within the knee, related to knee hyperextension; may be associated with a generalised joint hypermobility syndrome, which can have a complex association with fibromyalgia; and much less commonly with true hyperlaxity disorders such as Ehlers–Danlos syndrome [8]. Those with any form of anatomical or soft tissue problem often present at a younger age and are more likely to redislocate sooner than those without an abnormality [5]. Those without abnormalities have a lower risk of recurrence, but have a higher risk of associated injuries, due to the greater force required to sustain a dislocation.

2. Treatment

Most studies describing treatment of first-time patellar dislocation are concerned with preventing recurrence, along with identifying and treating associated injuries. Little work has concerned prevention of short-term symptoms, such as anterior knee pain, or long-term effects such as the development of patellofemoral osteoarthritis. Treatment may be conservative, usually with immobilisation and physiotherapy, or operative, for acute stabilisation or fixation of associated injuries.

Conservative treatment has been poorly researched with few studies comparing intervention with controls [4]. Immobilisation has been assessed with variable results [4,9]. Cast immobilisation leads to a worse function, a longer rehabilitation time and a stiffer knee at the end of the day. Application of a removable splint may reduce initial pain, however, no immobilisation leads to the quickest initial recovery. Studies assessing the use of taping are all confounded by the lack of a control group [4,9]. Few studies have assessed weight bearing status, those that have conclude there is little difference in outcome between non, partial and full weight bearing [4]. Studies into physiotherapy programmes are slightly better researched when studying the difference between exercise programmes, with quadriceps programmes seeming to do as well as dedicated vastus obliquus medialis exercises [4]. The consensus groups also highlight during the rehabilitation phase that re-education on gait patterns and landing technique in sport may be important [10].

In the past, in both the acute and recurrent situations instead of reconstruction of the medial patellofemoral ligament (MPFL) a medial repair [1,3] or reefing was often performed along with a lateral patella retinacular release in the false belief that this would reduce the risk of redislocation. This latter structure stabilises the patella and a "lateral release" performed as a sole procedure for patellar dislocation is one that should not be undertaken [11,12]. A number of studies have looked at the difference between conservative treatment and operative intervention for the acute first-time patellar dislocation. A meta-analysis by Longo et al. [2] showed in the short term (five years) that the redislocation rate was lower in the operative group (25% vs 36%) but this was associated with a

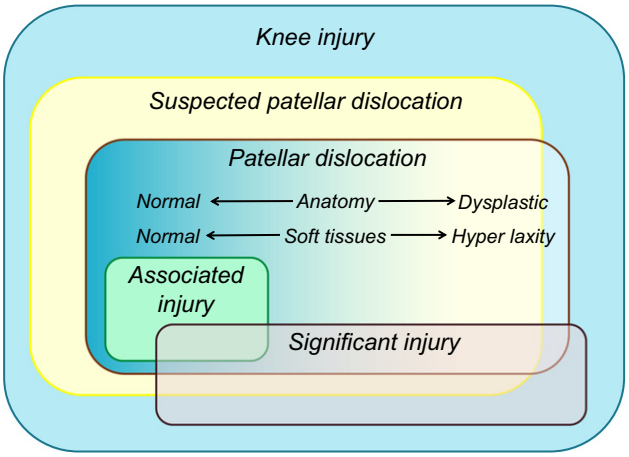

Figure 1. Overlap of suspected patellar dislocation with other knee injuries.

Table 2
Features suggesting the presence of a significant knee injury requiring specialist assessment.

Haemarthrosis
Inability to weight bear
Locked knee
Nonfunctional extensor mechanism
Definite/reported dislocation
Any other injury suspected based on ED records/radiographs

complication rate of 6.5%. In the long term there was little difference between the groups. Looking at the studies in more detail none are of particularly good quality and they observe a heterogeneous population. Despite this, most simply describe reconstruction of the MPFL amongst other procedures. This may explain why, although the redislocation rate is statistically significantly lower, 25% of surgically treated patients go on to dislocate again, a rate one would hope would be much lower to demonstrate clinical benefit. A Cochrane review [3] found a lower rate of dislocation overall but again with a significant difference between operative treatment and conservative treatment (12.9% vs 23.5%). Again it was highlighted that there was little attention within studies to the underlying pathology such as dysplasia. Although in the short term (two to five years) clinical scores favour surgical intervention, the converse is true in the medium term (six to nine years). There is little work in the literature with respect to the long term where stabilisation potentially could increase symptoms, such as anterior knee pain, and development of degenerative changes.

One must therefore question, despite the literature, why a surgeon would subject 2/3rds of patients who will not have a redislocation to an operation they will not need, that also carries a significant complication rate. The consensus groups therefore are recommending stabilisation for only those with recurrent dislocation that is symptomatic despite conservative treatment [10,12]. Also when stabilisation is undertaken then the correct procedure to repair or reconstruct structures, such as the MPFL, and address the underlying anatomical abnormalities should be undertaken [3]. This type of surgery should probably be undertaken within a unit with the support of a multidisciplinary team and appropriate governance systems in place to review practice.

Movement is clearly shifting to provide conservative treatment for all patients, counselling those more likely to redislocate and only providing acute surgery to attend to associated injuries [3]. Associated injuries are not uncommon [2] and may consist of damage that occurred during dislocation or relocation of the laterally displaced patella, such as chondral or osteochondral fragments arising from the lateral femoral condyle or medial facet of the patella. The latter may be accompanied with damage to the attachment of the patellar tendon; the former with more severe injuries such as a Hoffa's type fracture which can also be associated with the attachment of the anterior cruciate ligament.

In assessment of a patient with the acute first-time patellar dislocation one must also be mindful that the diagnosis is often based upon the history alone. In these circumstances it is entirely possible that a different injury may have been sustained. Most commonly the history is confused with an anterior cruciate ligament (ACL) tear, but even a true knee (tibiofemoral) dislocation may present as a patellar dislocation. Also patellar dislocation can be confused with medial collateral ligament (MCL) injuries, due to the presence of tenderness at the adjacent femoral attachment of the MPFL. Conversely, patients convinced they have had a dislocation may have only sustained a minor soft tissue injury, such as bone bruising or impingement of the fat pad, something the authors have seen more commonly in those with generalised joint hyperlaxity or in the morbidly obese patient.

Table 3
Assessment in the acute knee injury clinic.

History
Age/sex
Mechanism of injury
Confirmation of dislocation — e.g. required reduction by paramedic
History of contralateral dislocation
History of hypermobility/other syndromes
Family history — dislocation/hypermobility
Examination
General
• Beighton score
• Examination of the opposite limb
• Rotational alignment assessment
Affected limb
• Effusion/haemarthrosis
• Tenderness — MPFL/LFC/medial border patella
• Range of motion — block to extension
• Exclusion of other ligamentous/extensor injuries
• Assessment of patellar stability

Table 4
Indications for an MR scan after suspected patella dislocation.

Haemarthrosis
Concern for osteochondral injury
Locked knee
Alternative injury suspected
Diagnosis uncertain (e.g. ACL tear vs patella dislocation)
Difficult patient assessment (e.g. morbidly obese patient)
Symptoms continue after conservative treatment

3. Assessment

Assessment at first presentation may be difficult, especially as an increasing number of referrals with acute knee injuries may now be made through a virtual fracture clinic or equivalent process. As highlighted in the previous section, it is important to separate out those with a true patellar dislocation from those who have not had a dislocation, while ensuring all other significant injuries are picked up including injuries associated with a patella dislocation, Figure 1. Assessment of the risk of redislocation may be made subsequently once the patient has been seen, based on their demographics and any anatomical/soft tissue abnormalities present [5,6].

Most, but not all, significant knee injuries will have been referred directly to an on-call service. Any injuries missed along with lesser injuries should be sent to an acute knee injury clinic within a one to two week period [10]. For those cases triaged in the virtual fracture clinic setting, the clinician will be presented with a history and examination often taken by very junior medical or paramedical staff. It is important to recognise that the recorded history and examination may be incomplete or incorrect. Plain radiographs may have been undertaken and can aid decision making. It is important that any patient presenting with features suggestive of a significant injury should be brought to an acute knee injury in an appropriate time frame for further assessment, Table 2.

In the acute knee injury clinic, a detailed history and examination should be performed, Table 3. The aim is to confirm a patella dislocation, exclude alternative injuries and to assess for associated injuries. Examination may be difficult at this stage and, providing no immediate investigation or intervention is required, reassessment about two weeks later may be valuable. Radiographs if not previously performed should be undertaken with an anteroposterior (AP), lateral (with the posterior condyles aligned) and skyline films. These are most useful for assessing for fractures and some anatomical abnormalities (trochlear dysplasia/patella alta). Magnetic resonance (MR) imaging is increasingly available and is often undertaken routinely, however, where access is restricted it is not always mandated [10] unless the imaging will change management, Table 4. Certainly an MR scan would be indicated for a recurrent dislocation.

4. Management

Having confirmed a true lateral patella dislocation the first priority would be to manage any associated injuries, such as osteochondral fractures, in their own right. Management otherwise should be conservative in nature with rest, ice, compression and elevation preferably without use of a splint. If a splint is used it should be removable and not used for more than one to two weeks. Patients should be allowed to weight bear as comfort allows, with the aid of crutches. Physiotherapy should be commenced early and should be aimed at restoring range of motion, quadriceps function along with core hip stability followed by retraining for gait and return to sport. Although all patients should be followed up to ensure recovery, many fail to attend their appointments, a problem which has also been reported in many studies [3]. A reasonable approach therefore is to discharge all patients, without associated injuries, to the physiotherapy team who can refer any patient failing to progress back for review. Following recovery any patient with a recurrent dislocation or symptoms can be seen back where ultimately the need for surgical stabilisation can be assessed.

Much of the approach to managing the first-time patella dislocation is based on very little evidence. However, the circle is swinging towards initial conservative management and stabilisation for the symptomatically unstable. This is in the realisation that stabilisation is very unlikely to prevent the risk of developing subsequent osteoarthritis. These principles are very much the same as those recommended for the acutely injured anterior cruciate ligament, which has a much wider evidence base for this approach to initial management.

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Ethics committee approval

Ethical committee approval was not required for the production of this review article.

Declaration of competing interest

There are no conflicts of interest with respect to the publication of this article.

References

[1] Pagliazzi G, Napoli F, Previtali D, Filardo G, Zaffagnini S, Candrian C. A meta-analysis of surgical versus nonsurgical treatment of primary patella dislocation. Arthroscopy 2019;35:2469–81.
[2] Longo U, Ciuffreda M, Locher J, Berton A, Salvatore G, Denaro V. Treatment of primary acute patellar dislocation: systematic review and quantitative synthesis of the literature. Clin J Sport Med 2017;27:511–23.
[3] Smith TO, Donell S, Song F, Hing CB. Surgical versus non-surgical interventions for treating patellar disclocation. Cochrane Database Syst Rev 2015;2:CD008106.
[4] Moiz M, Smith N, Smith TO, Thompson P, Metcalfe A. Clinical outcomes after the nonoperative management of lateral patellar dislocations: a systematic review. The Orthopaedic Journal of Sports Medicine 2018;6(6):1–17.
[5] Christensen TC, Sanders TL, Pareek A, Mohan R, Dahm DL, Krych AJ. Risk factors and time to recurrent ipsilateral and contralateral patellar dislocations. Am J Sports Med 2017;45(9):2105–10.
[6] Hevesi M, Heidenreich MJ, Camp CL, Hewett TE, Stuart MJ, Dahm DL, et al. The recurrent instability of the patella score: a statistically based model for prediction of the long-term recurrence risk after first-time dislocation. Arthroscopy 2019;35(2):537–43.
[7] Chan CJ, Chau YJ, Woo SB, Luk HM, Lo IF. Familial patellar dislocation associated with t(15;20) (q24;q13.1). J Orthop Surg (Hong Kong) 2018;26(2) 2309499018777026.
[8] Malfait F, Wenstrup R, De Paepe A. Classic Ehlers–Danlos syndrome. GeneReviews® [Internet]. Seattle (WA): University of Washington, Seattle; 1993–2019.
[9] Farrell E. Do I (k)need to be free? Immobilisation after traumatic first time patellar dislocation. Royal College of Emergency Medicine clinical topic review examination; 2017.
[10] Farrell E. Best practice guidelines for conservative treatment of first time patellar dislocation Personal communication ; 2019.
[11] Caplan N, Nassar I, Anand B, Kader DF. Why do patellofemoral stabilization procedures fail? Keys to success. Sports Med Arthrosc Rev 2017;25(1):e1–7.
[12] Post WR, Fithian DC. Patellofemoral instability: a consensus statement from the AOSSM/PFF Patellofemoral Instability Workshop. Orthop J Sports Med 2018;6(1) 2325967117750352.