



The management of superior dislocation of the patella with interlocking osteophytes— an update on a rare problem

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ABSTRACT

The superior dislocation of the patella with interlocking osteophytes is a rare condition. A review of the English literature revealed only 12 reported cases. The purpose of reviewing these case reports is to highlight the unusual presentation and the injury mechanism in 2 of our patients, and to present our treatment algorithm. Closed reduction with manipulation of the patella, with or without anaesthesia, was performed without difficulty. We recommend an intermediate step of trying a regional nerve block before proceeding to general anaesthesia. Our patients had full range-of-motion after reduction and they were symptom-free after 3 years of follow-up. There were no recurrent dislocations in our patients.

Key words: *exostoses; knee injuries; osteoarthritis, knee; patellar dislocation*

CASE REPORTS

Our series covers a total of 4 cases, all of which have been summarised in the Table (patients 13–16). We elaborate upon 2 of these.

Case 1

A 50-year-old man had an industrial accident in which his right knee was hit by a piece of cargo from the front and below. He complained of severe right knee pain and was unable to flex his knee when presented at Queen Mary Hospital, Hong Kong in February 1998. Physical examination showed effusion of the right knee. The patella was high lying and the knee was locked in extension. Tenderness was mainly localised over the infra-patellar region.

Radiographs showed that the patella was superiorly dislocated (Fig. 1). There was interlocking between the osteophytes of the patella and the anterior femoral condyle. Incidentally, there was unfused tibial apophysis which was compatible with Osgood-Schlatter's disease.

Five milligrams of diazepam and 30 mg of pethidine were intravenously administered to the patient. Closed



Figure 1 (a) Superiorly dislocated patella in case 1. Note the tilting of the patella, signifying the locking. (b) Unlocked knee in case 1. The severity of the osteophytes bears no relationship to the probability of developing locking.

reduction was performed, with hyperextension of the knee to exaggerate the deformity and manipulation of the patella to unlock the osteophytes. The patella fell back to the normal position almost instantaneously, without forceful manipulation.

After the reduction, the knee pain was relieved immediately and active flexion of the knee joint was possible without significant pain. Post-reduction radiographs of the knee joint confirmed the normal alignment of the patella. The patient received a course of physiotherapy, including range-of-motion exercise and muscle strengthening. He resumed his original duty 2 weeks after the injury. He has been followed up for 3 years and his knee joint is pain-free, with no recurrence of dislocation.

Case 2

An 88-year-old woman was admitted to Queen Mary

Hospital, Hong Kong in October 1999 for acute exacerbation of arthritic knee pain. Initially she was treated conservatively with rest, analgesics, and physiotherapy. She was discharged uneventfully and was able to walk with a stick. Three weeks later, she was followed up in the outpatient clinic and we found that her problematic knee was locked in extension. She was unable to recall any significant history of injury during those 3 weeks. A lateral radiograph showed a high-lying patella locked in position by the inferior patellar osteophytes and the femoral osteophytes (Fig. 2).

An intra-articular, local injection of anaesthetic and saline was given but failed to unlock the knee. On induction of general anaesthesia, the knee spontaneously unlocked without any manipulation; however, it became locked again in the recovery room. A regional nerve block of the quadriceps enabled the knee to be unlocked and it was protected in a more



Figure 2 Outpatient lateral radiograph of case 2. The pathology is easily missed.

flexed position using a temporary plaster splint until the patient was fully awake. She has been followed up for 3 years without any further problems.

DISCUSSION

The superior dislocation of the patella is a rare injury around the knee joint. It was first described by Watson-Jones¹ in 1956. Since then there have only been 12 reported cases (4 male and 8 female) in the English medical literature up to 2003 (Table).¹⁻¹¹ Female patients were also more dominant in our series. The usual mechanisms of injury include direct impact on the patella,^{2,3,5,6} hyperextension of the knee joint,^{1,3,4,7,8} or a combination of the 2. A characteristic of this condition is that the interlocking osteophytes prevent the spontaneous reduction of the proximally displaced patella.^{2,4,7-9} Hence, it is not uncommon to find marked osteoarthritic changes in the patello-femoral joint.

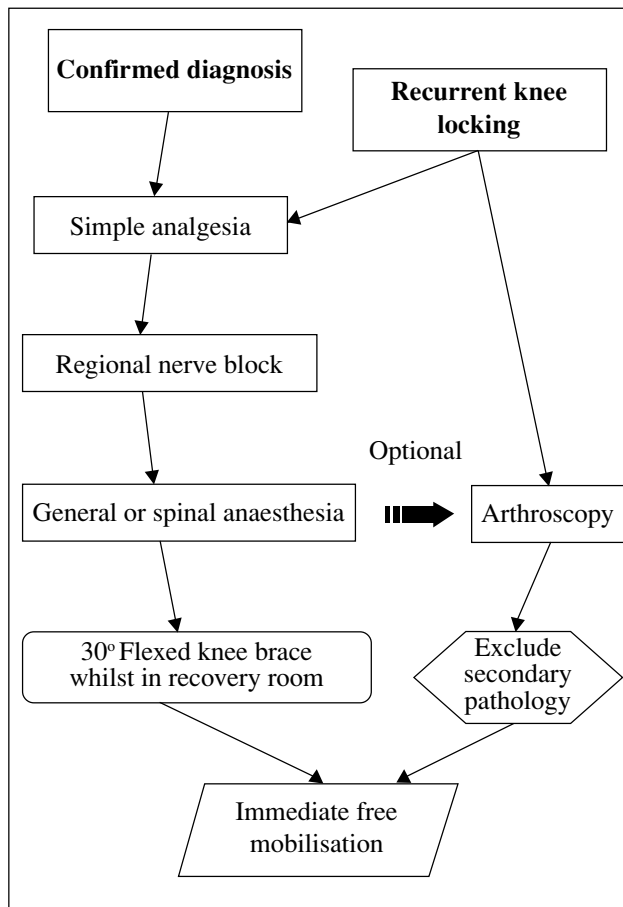


Figure 3 Algorithm for the management of locked knee

Prominent osteophytes over the inferior pole of the patella as well as on the anterior femoral condyle are usually seen. These indicate knee osteoarthritis, which explains why the usual age of the patients at presentation is between 50 and 60 years. The mean age of all the patients reported was 60 years.

Most patients with this injury can be treated non-operatively and surgical intervention is rarely indicated. Nearly all the cases (15 out of 16) were reduced by closed method; only one patient required open reduction.⁸ General anaesthesia is normally not required and sedation is usually adequate for the reduction. Several methods of closed reduction have been proposed, including initial hyperextension of the knee joint followed by passive flexion, or upward pressure over the patella and manipulation.^{2-4,7,11} We found that the former was safer and more effective because forceful manipulation might result in a fracture of the inferior pole of the patella. General anaesthesia has the advantage of relaxing the muscle

Table
Summary of cases in the literature and in present study¹⁻¹¹

Patient	Literature	Sex	Age (years)	Injury mechanism	Treatment	Complication
1	Watson-Jones, ¹ 1956	M	67	Hyperextension	CR [*]	No
2	Bartlett et al., ² 1976	F	52	Direct trauma	CR	No
3	Wimsatt and Carey, ³ 1977	F	81	Hyperextension	CR	No
4	Wimsatt and Carey, ³ 1977	M	50	Direct trauma	CR	No
5	Siegel and Mac, ⁴ 1982	F	58	Hyperextension	CR	No
6	Hanspal, ⁵ 1985	F	62	Direct trauma	CR	No
7	Friden, ⁶ 1987	F	56	Direct trauma	CR	No
8	Teuscher and Goletz, ⁷ 1992	F	60	Hyperextension	CR and subsequent arthroscopy	Recurrence
9	Rao and Meese, ⁸ 1997	M	66	Hyperextension	OR [†]	No
10	Takai et al., ⁹ 1998	F	45	Voluntary dislocation	Voluntary and subsequent arthroscopy	No
11	Scott et al., ¹⁰ 2000	M	55	Hyperextension	CR under general anaesthesia	No
12	McWilliams and Binns, ¹¹ 2000	F	43	Unknown	CR under general anaesthesia	No
13	Present study (case 1)	M	50	Direct trauma and hyperextension	CR under sedation	No
14	Present study (case 2)	F	88	Insidious onset	CR under regional nerve block	Re-locked after general anaesthesia. Reduced again under regional nerve block
15	Present study (case 3)	F	64	Sprain, sudden onset	CR under sedation	No
16	Present study (case 4)	F	66	Sudden onset	Spontaneous reduction	No

* CR closed reduction

† OR open reduction

and allows a very gentle reduction. There is thus less chance of fracturing an osteophyte and creating an intra-articular loose body. However, we recommend trying a regional femoral nerve block before general anaesthesia, preferably in the induction room (Fig 3). If this intermediate step is successful, then general anaesthesia can be avoided; this is particularly advantageous to older patients.

After the reduction, immobilisation is generally not required unless there are associated theoretical risk factors for recurrent dislocation. These include patella alta, ligamentous laxity, paralytic disorders, and pre-existing genu recurvatum deformity.^{2,9} One case in the literature reported 3 episodes of recurrent dislocation, which subsequently required arthroscopic debridement of the osteophytes.⁷ In our series, our third patient probably suffered recurrent superior dislocation of the patella. She did not experience further symptoms after the initial conservative treatment, and the 3-year follow-up did not show any evidence of recurrence.

We suggest that the decision for operation

should not be made based solely on radiological appearances. Even a repeated episode of locking is not an absolute indication for surgery. One of the cases reported in the literature that required arthroscopic resection of the osteophytes was simply a case of voluntary dislocation.⁹

We recommend maintaining the knee in a slightly flexed position during recovery from sedation or anaesthesia. Occasionally, the anaesthetic reversal may not be smooth, and any struggle or muscle spasm may re-lock the knee. Likewise, patients recovering from sedation may struggle, thus hyperextending and re-locking the knee. Our experience showed that it was safe to start mobilisation of the knee joint under the supervision of a physiotherapist. Patients should prevent hyperextension of the knee during the range-of-motion exercise. Most of the patients recovered early without any sequelae.

Our series showed that the true incidence of dislocation of the patella is probably under-reported. Our third case had probably spontaneously reduced on earlier occasions. Radiological appearance alone

or repeated episode of locking is not a strict indication for surgical intervention.

CONCLUSION

The superior dislocation of the patella is a rare knee joint injury, the mechanism of which involves hyperextension or direct contusion onto the patella.

Although interlocking osteophytes may prevent the dislocation from spontaneous reduction, it can be easily reduced by the closed method under sedation. We prefer a regional nerve block to general anaesthesia because it has a major advantage for older patients. The restriction of motion is unnecessary except during periods of recovery from unconsciousness. The majority of our patients recovered uneventfully.

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