Case Report

Neglected locked vertical patellar dislocation

Rakesh Kumar Gupta, Vinay Gupta, Sukhbir Singh Sangwan, Pradeep Kamboj

Abstract

Patellar dislocations occurring about the vertical and horizontal axis are rare and irreducible. The neglected patellar dislocation is still rarer. We describe the clinical presentation and management of a case of neglected vertical patellar dislocation in a 6 year-old boy who sustained an external rotational strain with a laterally directed force to his knee. Initially the diagnosis was missed and 2 months later open reduction was done. The increased tension generated by the rotation of the lateral extensor retinaculum kept the patella locked in the lateral gutter even with the knee in full extension. Traumatic patellar dislocation with rotation around a vertical axis has been described earlier, but no such neglected case has been reported to the best of our knowledge.

Key words: Patellar dislocation, vertical patellar dislocation, neglected injury

Introduction

Lateral dislocation of the patella is commonly encountered while intraarticular dislocations are rare and involve rotation of the patella around its horizontal or vertical axis.[1] The vertical type occurs when the articular surface of the patella faces medially or laterally, indicating a rotation about a vertical axis, with lateral shifting being more common of two types.[2] Dislocations associated with rotational elements can be difficult to reduce by closed methods and can have associated osteochondral injuries.[2] The rarity of these dislocations is evident by the lack of their description in text.[3] Of the few vertical dislocations reported in literature, the reported mechanism is of a severe driving force to the medial or lateral aspect of the patella with the knee extended, resulting in disruption of the retinacula. The neglected patellar dislocation on its vertical axis presents a diagnostic dilemma. The present report describes the characteristics of a neglected patellar dislocation with rotation on its vertical axis, its possible mechanism of injury, and management.

Department of Orthopaedics, Physical Medicine, Paraplegia and Rehabilitation, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences, Rohtak, India

Address for correspondence: Dr. R. K. Gupta, 1/7J Medical Enclave, Rohtak – 124001, India.
E-mail: drrk60@rediffmail.com

Access this article online	
Quick Response Code:	Website: www.ijoonline.com
	DOI: 10.4103/0019-5413.101045

Case Report

A 6 year-old male child, sustained injury to right knee and foot while stepping down from bus and bus suddenly picked speed, injuring his right knee and foot. He fell down from the bus and subsequently his foot was run over by the bus. He presented to the emergency in a primary health center with a fracture calcaneus and a grossly swollen and bruised knee. A plaster of paris boot cast was given for fracture calcaneus and the knee injury was managed as a soft tissue injury. The patient continued to have persistent pain in right knee swelling and difficulty in walking, hence reported to us 2 months after initial injury. Physical examination of the right knee revealed tenting of skin anterolaterally, notable lateral fullness, and the patella was slightly tender, immobile, and locked. The patella was immobile even in extended knee. The knee could not be flexed because of pain and tautness of soft tissue around the patella, though overlying skin was mobile and normal. The patient was able to walk with a limp. There was no joint effusion. There was no history of previous dislocations or pathology or joint laxity. The soft tissues medial to the patella were tender. There was no palpable gap in the extensor mechanism. Radiological examination revealed a laterally wedged patella in AP view with no patellar shadow in lateral view [Figure 1].

Since closed reduction was not feasible hence, under general anesthesia, an open reduction was planned. Through midline incision, the knee was exposed and patella was found to be wedged lateral to lateral femoral condyle. There was a continuous sheet of fibrous tissue from patella to medial extensor retinaculum, giving no indication of rotational element of patella. Suspecting a clockwise rotation on its vertical axis due to its lack of mobility, an initial small incision was made on the surface of patella,

which confirmed that the articular surface of patella was facing antero-laterally [Figure 2]. As a result, the fibrous tissue medial to patella was incised by a longitudinal incision and patella derotated in an anticlockwise direction to bring it to its normal position. There were no osteochondral fragments. The articular surfaces of the patella and the lateral femoral condyle were not damaged. The medial extensor retinaculum was repaired and plicated. The lateral extensor retinaculum being lax stretched over the articular surface of patella and did not require any release. Instead, a plication was done to take care of the laxity on lateral aspect. The knee was placed through a full range of motion and normal patellar tracking was noted.

Postoperatively, the knee was kept in full extension with a knee immobilizer, but was allowed full weight bearing and perform isometric quadriceps strengthening exercises. After 6 weeks, he was allowed to begin active flexion and extension exercises. He had returned to his normal activities at 6 months. He had no symptoms of patellar instability, normal muscle strength, and exhibited full range of motion [Figures 3 and 4].

Discussion

Dislocation of the patella with vertical axis rotation was originally described by Cooper in 1844.[4] This is an exceedingly rare injury, having been reported only a few times since then [Table 1].

Ofluoglu *et al.* have recommended classification into two main groups depending on the location of the patella in the patello femoral joint.[11] In intraarticular dislocations, the patella remains in its anatomical position and is only rotated around its vertical or horizontal axis. In extraarticular dislocations, the patella is displaced outside the patello femoral joint. According to this classification, the present dislocation can be classified as an extraarticular lateral dislocation with rotation on the vertical axis.

Figure 1: (a) Preoperative anteroposterior X ray of the knee shows laterally wedged patella (arrow); (b) lateral X-ray showing absence of patellar shadow

Figure 3: (a) Postoperative lateral X-ray showing normally located patella; (b) postoperative anteroposterior X-ray showing absence of laterally wedged patellar shadow

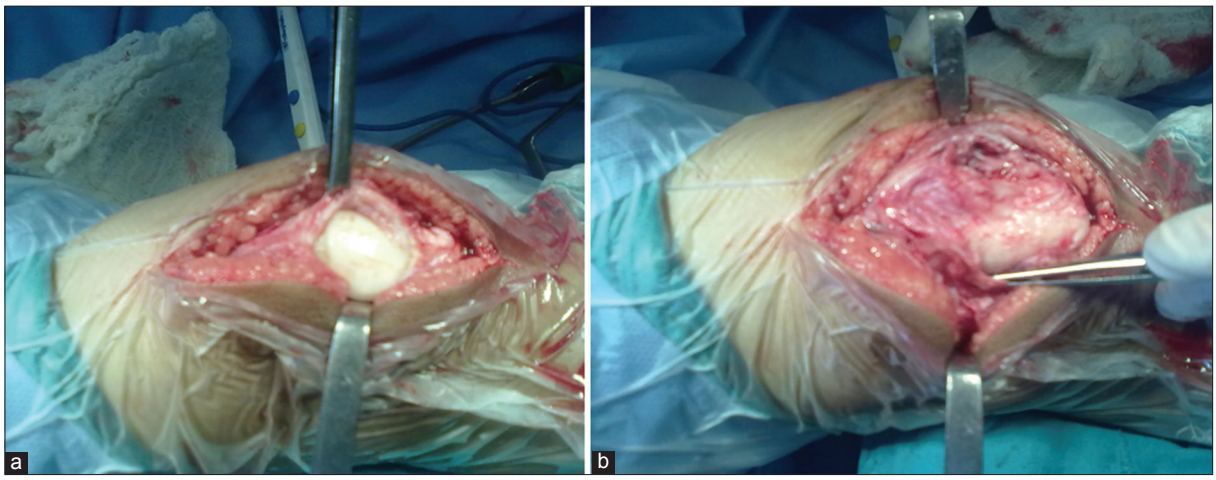

Figure 2: (a) Intraoperative picture showing dislocated patella with articular surface facing anterolaterally; (b) lateral retinaculam covering the articular surface of dislocated patella

Figure 4: Clinical photograph showing (a) full extension; (b) full flexion

Table 1: Review of literature

Author	Description	No. of cases	Mechanism of injury
Singletary *et al.*[5]	Fresh, intraarticular, intercondylar dislocation of patella with vertical axis rotation	One case	Blunt trauma
Gidden *et al.*[6]	Fresh patella dislocation with vertical axis rotation with Salter-Harris III physeal fracture	One case	Road traffic accident
Corso *et al.*[7]	Acute extra-articular dislocation on the vertical axis with 90° rotation	One case	Injured while wrestling
ElMaraghy *et al.*[8]	Fresh, extra-articular patella dislocation, nearly 180° on its vertical axis	One case	Slipped on ice
Wajid *et al.*[9]	Intercondylar, intra-articular lateral patellar dislocation with ipsilateral shaft of femur fracture	One case	Collision on a roller-coaster ride
Shetty *et al.*[10]	a. Extraarticular patella dislocation with 90° vertical rotation	Two cases	a. Fall while playing football
	b. Fresh, intraarticular dislocated patella with rotated patella wedged between the femoral condyles		b. Fall from ladder

Although the exact mechanism of injury in vertical dislocation of patella is not clear, most often, these injuries are associated with sporting activities and occur as a result of direct blow to the medial aspect of patella with knee in near extension or a twisting injury to lower limb with forced internal rotation of the femur on externally rotated planted tibia while the knee is flexed. The patella rotates on its vertical axis and gets wedged within intercondylar groove or outer surface of lateral femoral condyle.[12] Laxity of the ligaments allowing for greater mobility of the patella was thought to be a predisposing factor in adolescent patients.[13] Colville suggested that a valgus strain on the knee could cause the patella to rotate on its vertical axis and the continued pull of the quadriceps would then hold the patella on its edge.[10,14] The diagnosis is easily made on physical examination. The knee is held in extension and the patella tents the skin.

Vertical dislocations pose a therapeutic challenge and often require open reduction. Some authors have reported success with closed reduction under conscious sedation.[15] In a recent review, open reduction was recommended to reduce the risk of chondral damage by repeated attempts at manipulation and to repair or remove any osteochondral fractures.[13] The malrotated patella results in increased tension within the extensor mechanism, which in turn locks the patella between the femoral condyles, making manipulation difficult.

The present case involves a lateral dislocation of the patella in a male adolescent, which occurred with a direct blow. The mechanism of injury was a laterally directed blow to the medial aspect of the knee with a twisting force due to fall. The patella was dislocated with more than 90° rotation about its vertical axis, wedged lateral to the lateral femoral condyle with articular surface facing anterolaterally. The increased tension generated by the rotation of the lateral extensor retinaculum kept the patella locked in the lateral gutter even with the knee in full extension. In such a situation, the closed manipulation is unlikely to succeed, more so when the dislocation has become old and neglected. Shetty *et al.* have advocated multiple attempts at closed reduction in their case report, but in a fresh case[10] one should suspect a rotatory component and proceed to open reduction without further attempts at closed reduction, which will only serve to increase any chondral damage to the patella or the condyle. In a fresh case, gap in the medial retinaculam gives an indication of the location of damage and clue to rotational element of the dislocation. This is not seen in a neglected case due

to healing of the damaged medial retinaculam by fibrosis, making it look like a conventional lateral dislocation. Most of the patellar dislocations require lateral release procedures for maintaining stability due to tight lateral structures. However, an initial lateral release, with medial retinaculum already disrupted, is likely to compromise the blood supply of patella on both sides besides adding to the instability. Rotational element has to be recognized before incising the retinaculum; otherwise, one is likely to incise the lateral retinaculum as well, further jeopardizing the blood supply to patella.

To conclude the vertical patellar dislocation is uncommon and if it is neglected vertical patellar dislocation its management becomes compounded.

References

1. Frangakis EK. Intraarticular dislocation of the patella. J Bone Joint Surg Am 1974;56:423-4.
2. Huang CJ. Lateral patellar dislocation with vertical axis rotation of the patella after attempted reduction of typical patellar Dislocation. Pediatr Emerg Care 2008;24:694-6.
3. Gann N, Nalty T. Vertical patellar dislocation: A case report. J Orthop Sports Phys Ther 1998;27:368-70
4. Cooper A. A treatise on the dislocations and fractures of the joints. Philadelphia: Lea and Febiger; 1844. p.178.
5. Singletary EM, Dobson J. Intercondylar dislocation of the patella with vertical axis rotation. Am J Emerg Med 1999;17:76-7.
6. Gidden DJ, Hall KM. An unusual case of irreducible intra-articular patella dislocation with vertical axis rotation. Injury 1995;26:643-4.
7. Corso SJ, Thal R, Forman D. Locked patellar dislocation with vertical axis rotation: A case report. Clin Orthop 1992;279: 190-3.
8. ElMaraghy AW, Berry GK, Kreder HJ. Irreducible lateral patellar dislocation with vertical axis rotation: Case report and review of the literature. J Trauma 2002;53:131-2.
9. Wajid MA, Cheema MQ, Siddique MS. Vertical Axis Patellar dislocation with ipsilateral femoral fracture: Use of a closed percutaneous technique for reduction of the dislocation. J Orthop Trauma 2006;20:143-6.
10. Shetty S, Ramesh B, Gul A, Madhusudan TR, Altayeb T. Vertical dislocation of the Patella: Report of 2 Cases. Orthopedics 2009;32:768-70.
11. Ofluoglu O, Yasmin D, Donthineni R, Muzaffler Y. Superior dislocation of the patella with early onset patellofemoral arthritis: A case report and literature review. Knee Surg Sports Traumatol Arthrosc 2006;14:350-5.
12. Levin GD. Vertical axis rotational dislocation of the patella. Orthop Rev 1978;7:83.
13. Abdelhalim E, Elmirini A, Boutayeb F, Habi S, Maatouqui K, Leleu JM. Lateral patellar dislocation with vertical axis rotation of 90 degrees. Am J Emerg Med 2007;25:733.
14. Colville J. An unusual case of intraarticular dislocation of the patella. Injury 1978;9:321-2.
15. Sherman SC, Yu A. Patellar dislocation with vertical axis rotation. J Emerg Med 2004;26:219-20.

How to cite this article: Gupta RK, Gupta V, Sangwan SS, Kamboj P. Neglected locked vertical patellar dislocation. Indian J Orthop 2012;46:581-4.

Source of Support: Nil, **Conflict of Interest:** None.