



Case Report

Horizontal Intra-Articular Patellar Dislocation Resulting in Partial Quadricipital Tendon Avulsion with Sleeve Fracture of the Proximal Patellar Pole: A Case Report in a 10-Year-Old Boy

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Introduction

Intra-articular dislocation of the patella is a very rare condition with less than 50 cases reported worldwide [1-3]. Horizontal dislocations cause the patella to wedge into the intercondylar notch and the articular surface of the patella will face superiorly or distally [1,3-9]. Upward-facing and downward-facing of the articular surface depends on which pole of the patella is detached from its attachments [6]. On this point, a detached upper pole attachment of the patella leads to horizontal dislocation with the articular surface facing downwards and vice et versa [3]. Horizontal intra-articular dislocations can be treated with an attempt at closed reduction, but open reduction may be necessary for allowing the surgical treatment of concomitant lesions [1,3-9]. In the reported case, the patella was tilt along its horizontal axis with a sleeve fracture of the proximal pole of the patella. The reduction may be achieved by closed reduction but an open surgical approach was necessary for allowing reduction and osteosynthesis of the sleeve fracture.

Case

A 10-year-old boy fell because of a failed jump attempt while skateboarding, and his left knee struck a low wall, sustaining a direct blow. He presented with a knee locked at 90° of flexion, and a step deformity overlying the patella was evident. He was fully unable to bear weight, as well as actively flexing or extending the articulation. No neurovascular compromise was present. Radiographs were obtained with the knee in the flexed position and showed a horizontal intra articular patellar dislocation (Figure 1a&1b), with the superior pole of the patella locked within the intercondylar femoral notch. A sleeve avulsion fracture was also noted at the proximal at the superior pole of the patella, and the articular surface of the patella was facing downwards. A close reduction under sedation was achieved in the emergency room by flexing the knee and by applying a gentle pressure to the inferior pole of the patella for releasing it from its entrapped position beneath the intercondylar notch. A post reduction radiograph confirmed the reduction of the patella. The patient was then taken

to the operating room and a short midline incision was realized; inspection demonstrated that quadriceps tendon had avulsed completely of the proximal pole of the superior pole of the patella. However, patellar medial and lateral retinacula as well as anterior fascia lata and Sharpey's fibers were unbroken and warranted the integrity of the knee extensor mechanism. The quadriceps tendon and the sleeve fracture were refixed to the superior pole of the patella by trans-osseous sutures. The patient was then placed into an extension knee brace for 6 weeks and was allowed to fully weight bear. Physical therapy was then initiated, and 3 months after the surgery, the patient recovered full knee of motion.

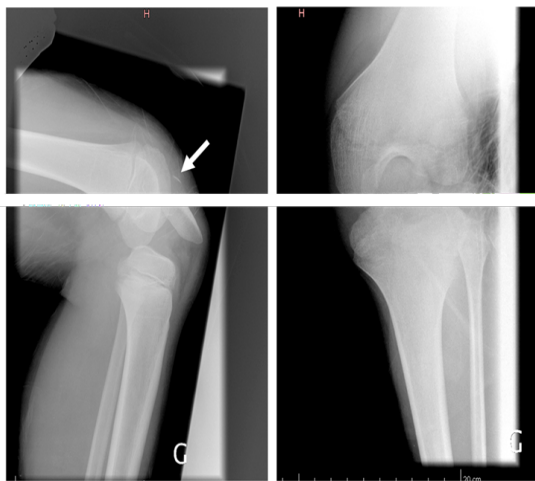


Figure 1: Radiographs were obtained with the knee in the flexed position and showed a horizontal intra articular patellar dislocation, with the superior pole of the patella locked within the intercondylar femoral notch. The articular surface of the patella was facing downwards, and a sleeve avulsion fracture was also noted at the proximal at the superior pole of the patella (arrow).

Discussion

Horizontal dislocation is the more frequent type of intra-articular dislocations of the patella. In this case, the patella rotates around its horizontal axis and the articular surface may face either downwards, with its upper pole lying in the intercondylar notch, or upwards, with its lower pole lying in the intra articular space [4]. The mechanism of horizontal intra-articular dislocations is typically a direct blow to the proximal/distal pole of the patella while the knee is in flexion. Forces of the blow will push either the superior or the inferior in a posterior direction into the intercondylar notch and may cause a partial detachment of the quadricipital or the patellar tendon from the patella [10]. The patella rarely detaches of the patellar tendon and the extensor mechanism classically does not

rupture in the majority of published cases [8], since medial and lateral retinacula as well as Sharpey's fibers result usually intact. Cases of horizontal intra-articular dislocations with intact extensor mechanism may be managed with closed reduction under general anesthesia or at least adequate sedation with muscle relaxation [7-9,11-14]. Maintaining the hip in flexion during closed reduction to relax the quadriceps may be helpful in order to avoid the need for greater force [15]. Applying a gentle pressure to the pole of the patella may be essential for releasing it from its entrapped position beneath the intercondylar notch. On this point, Murakami et al. suggested that successful closed reduction depends on the degree of locking of the patella within the joint. Many authors recommend to perform manipulations under general anesthesia or at least under conscious sedation, providing that good relaxation and pain relief are achieved. When closed reduction is achievable, a meticulous physical exam should assess after reposition for the integrity of the extensor mechanism and the possibility of osteochondral fracture, and the knee stability. In suspicious cases, postreduction MRI should be considered to identify potential associated injuries that may benefit from surgical management [16,17]. In children, horizontal intra articular dislocation of the patella may be reported with avulsion sleeve fracture of the superior pole of the patella, as in the present case. This combination has rarely been reported apart from the one described with a sleeve fracture in a child by Manipuri [15]. In children, sleeve fracture usually represent osteochondral avulsion of the patella's pole including often large articular surface, as well as periosteum over the dorsal surface. Conventional radiographs usually underestimate the severity of the sleeve fracture if there is not a high index of suspicion, and diagnosis may be missed or severely delayed due to clinical unfamiliarity. For full function recovery, the sleeve fracture should be properly treated with open reduction, internal fixation and immobilization. Untreated case may lead to severe functional complications including patella magna, extensor lag, and quadriceps muscle weakness and atrophy, resulting even in permanent disabilities [2,18,19]. Thus surgical treatment should be usually recommended for sleeve fracture of the patella even if the displacement seems not to be excessive. In cases where closed reduction is feasible, a meticulous physical exam after reduction should assess for the integrity of the extensor mechanism, of the knee stability, and the possibility of osteochondral fracture (as evidenced by a large hemarthrosis). In suspicious cases, postreduction MRI should be considered to identify potential associated injuries that may benefit from surgical management [16,17]. The case of our patient is rare in that we managed the intra-articular dislocation by closed reduction and the subsequently detected patellar sleeve fracture operatively with a successful outcome. Awareness of this rare combination of injuries will help in the early diagnosis and appropriate treatment of this condition.

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