

Case Report

Intra-Articular Dislocation of the Patella: A Case Report

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Abstract: Acute dislocation of the patella occurs commonly to the lateral side. Intra-articular dislocation with rotation of the patella around its horizontal or vertical axis, although rare can occur. In this type of injury, the displaced patella becomes locked within the joint and rarely can be reduced by manipulation. The following report describes an additional case of this lesion, which was associated to an avulsion of the quadriceps tendon.

Keywords: Acute dislocation, Intra-articular, Patella, orthopaedic practice.

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INTRODUCTION

Acute traumatic intra-articular dislocation of the patella is not a common presentation in orthopaedic practice; less frequently observed than extra-articular dislocation of the patella [1, 2]. It occurs when the patella becomes locked within the joint after usually rotating around its horizontal axis or rarely its vertical axis. Most have occurred in adolescents and required open reduction [2, 3]. We report a rare case of intra-articular dislocation of the patella associated to an avulsion of the quadriceps tendon.

CASE

A 16-year male, without past medical history presented to our emergency department with a twisting injury of the left knee during a sport activity. The

patient presented with severe pain, knee swelling, and was unable to stand.

Examination showed small-lacerated wounds on the anterior aspect of both knees. The left knee was held in slight flexion, and a marked prominence was noted at the level of the joint line associated with a depression in the supra-patellar region. He was unable to flex or extend his knee actively, and any attempt to do so elicited severe pain.

X-rays showed horizontal dislocation of the patella with incarceration of its lower pole engaged in the inter-condylar groove of the femur. The articular surface faced inferiorly. The shadow of the quadriceps tendon showed discontinuity (Figure 1).



Figure 1: X-rays of the left knee showing horizontal patellar dislocation

The patient was operated through a medial para-patellar approach. Per-operatively, the patellar was dislocated with its lower pole trapped in the inter-condylar groove of the femur (Figure 2).

The complete disruption of the quadriceps tendon at the superior patellar pole was associated with a periosteal sleeve avulsion (Figure 2). Patellar retinaculum were intact.



Figure 2: A) Horizontal dislocation of the patella trapped into the inter-condylar groove of the femur, B) Quadriceps tendon rupture associated to Periosteal sleeve avulsion

Transosseous technique was utilized using three transpatellar tunnels (figure3). Avulsed periosteum was anatomically repaired after tensioning the sutures.

Surgery was followed by a 45-day immobilization of the limb using a knee brace in full extension.



Figure 3: Quadriceps tendon suture using transosseous technique

Postoperative lateral radiograph showed an adequate position of the patella with Caton-Deschamps index of 0.9 (Figure 4).



Figure 4: Postoperative lateral radiograph showing an adequate positioning of the patella in the trochlear groove and a normal Caton-Deschamps index

The patient underwent 20 rehabilitation sessions for the left knee (starting with passive mobilization of the knee then active mobilization of the knee associated to quadriceps strengthening exercises). On 6-month follow-up, the patient had a normal mobility of the knee joint and was able to practice sports. At 18 months postoperatively, he had returned to all desired activities without limitations.

DISCUSSION

Intra-articular dislocation of the patella is a rare injury considering the very few cases reported in the literature. It was first described in 1887 [1]. It mainly occurs in adolescents [2].

Frangakis [2] thinks this is due ligament laxity in young allowing greater mobility to the patella. Others believe that this type of dislocation is secondary to rupture of the quadriceps tendon. However, Frangakis [2] reported a case with intact quadriceps tendon and no ligamentous injury.

Intra-patellar dislocation can occur around an horizontal or a vertical axis of rotation [3]. A violent contraction of quadriceps muscle is the leading mechanism of this injury [3, 4]. The horizontal dislocation is more common [4].

It results from a combination of forces develops, which results in rotation of the patella around its horizontal axis. When the knee joint is in flexion, the upper pole of the patella lies in front on the intercondylar groove. The initial blow, if exerted in the pole, pushes it posteriorly into the joint, which may lock. Therefore, the contraction of the quadriceps muscle detaches it from the upper part of the patella. By the continued action of the quadriceps, a moment of force occurs, which produces a rotation of the patella. As the detachment advances, the rotating moment increases. Thus, the actual rotating force is caused by contracting quadriceps muscle [2, 3].

The quadriceps tendon is often intact [5]. However, it's rupture was reported in few cases [6, 7]. In our case, the patella dislocation was horizontal, associated to an avulsion of the quadriceps tendon.

Trillat *et al.*, [8] reported, in 1968, the avulsion of the quadriceps tendon in young adults. It represents 40% of quadriceps tendon rupture. It is characterized by an avulsion of an osteoperiosteal sleeve from the base of the patella.

Patellar retinaculum can be also injured. In our case, patellar retinaculum were undamaged.

In few cases, patella can rotate in the opposite direction with the articular surface facing superiorly. It usually occurs when the patellar tendon is avulsed [9].

In horizontal dislocation of the patella, the articular surface is more likely facing inferiorly than superiorly with a ratio of 7/1.

Theodorides [10] described horizontal dislocation of the patella with incarceration of the patella under the lateral femoral condyle.

Open reduction is performed in order to avoid further articular injuries. It also permits to visualize knee cartilage and diagnose and repair an extensor system damage [10].

Some authors described in 2017 closed reduction under light sedation in an emergency department. It should be considered in the elderly population with comorbidities, in whom the risks of general anesthesia or major regional anesthesia are high [11].

CONCLUSION

Intra-articular dislocation of the patella is a rare injury. It could be described as an injury of adolescence. A violent contraction of quadriceps muscle is the leading mechanism of this injury. The patella usually rotates around its horizontal axis. The extensor system is usually intact, however quadriceps tendon rupture can be observed. In our case, we described an horizontal intra-articular dislocation of the patella associated to an avulsion of the quadriceps tendon. Open reduction should be performed with good functional results.

Competing interests: The authors declare no competing interests.

Authors' Contributions

All the authors have contributed to the management of the patient and the write up of the manuscript. All the authors have read and approved the final version of the manuscript.

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