



Irreducible Patellar Dislocation; Incarcerated into a Distal Femur Fracture: A Case Report and Review of the Literature

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Abstract

Introduction: Patellar dislocation is a relatively common injury. However, in rare circumstances along with dislocation of the patella, some types of fractures occur, making the treatment challenging and difficult.

Case Presentation: We report a 28-year-old man with dislocation of the patella, simultaneous Hoffa fracture, and incarcerated patella in lateral femur condyle fracture due to a serious motorcycle accident.

Conclusions: Generally, patellar dislocation can be reduced with open reduction or close reduction. There are some indications for open reduction of the patellar dislocation in the literature. We are going to introduce a new indication of open reduction for patellar dislocation and the clinical picture, diagnosis, pathogenesis, and treatment are discussed. Finally, the literature is reviewed based on previous studies.

Keywords: Patellar Dislocation, Incarceration, Distal Femur Fracture

1. Introduction

Dislocation of the patella is a relatively common injury that mostly happens among the youth (1). Dislocation of the patella accounts for almost 3% of all knee injuries (2). Its annual incidence rate is estimated to be 5.8 to 7 per 100000 people (1). Without proper treatments, this injury could cause wide negative effects, leading to the limitation in the movement (3, 4). Lateral dislocation is easily treated through closed techniques. Other less common types of patellar dislocation have been described in the literature, including medial, superior (5, 6) and with rotation about the horizontal (7) or vertical axes (8). Rotational patellar dislocation is most often irreducible and has a high incidence of chondral damage (9).

In rare cases, along with dislocation of the patella, some fractures occur that lead to a very difficult treatment. Hoffa fracture is one of those rare fractures that take place associated with supracondylar fracture of the femur (10). This injury often happens in motorcycle crashes or falling from heights (11). Despite the high incidence rate of dislocation of the patella, we are going to report a rare case with dislocation of the patella, simultaneous Hoffa fracture, and incarcerated patella in lateral femur condyle. Furthermore, the injury could not be reduced through

closed techniques. Vigorous attempts to perform a reduction in these circumstances can disturb the articular surface of the patella. Therefore, open reduction is an appropriate treatment strategy in these cases.

2. Case Presentation

A 28-year-old man was transferred to the emergency room immediately after an accident that led to the direct injury to his right knee. The patient was a motorcycle rider whose symptoms mostly was comprised of pain and swelling. In addition, his left knee was in extended and valgus posture meanwhile, extremely painful at palpation, leading to a restricted range of motion.

In the past surgical history, his femoral shaft was broken 2 years ago due to a motorcycle accident and fixed by intramedullary nailing, but he did not report any past knee injury or pain. Deformation of the knee and dislocation of the patella was obvious through the initial observation in the emergency ward. The patella was twisted on its vertical axis to the distal lateral femur condyle (Figure 1). The X-ray and CT scan examinations were obtained to confirm the diagnosis of patellar dislocation (Figures 2 and 3).

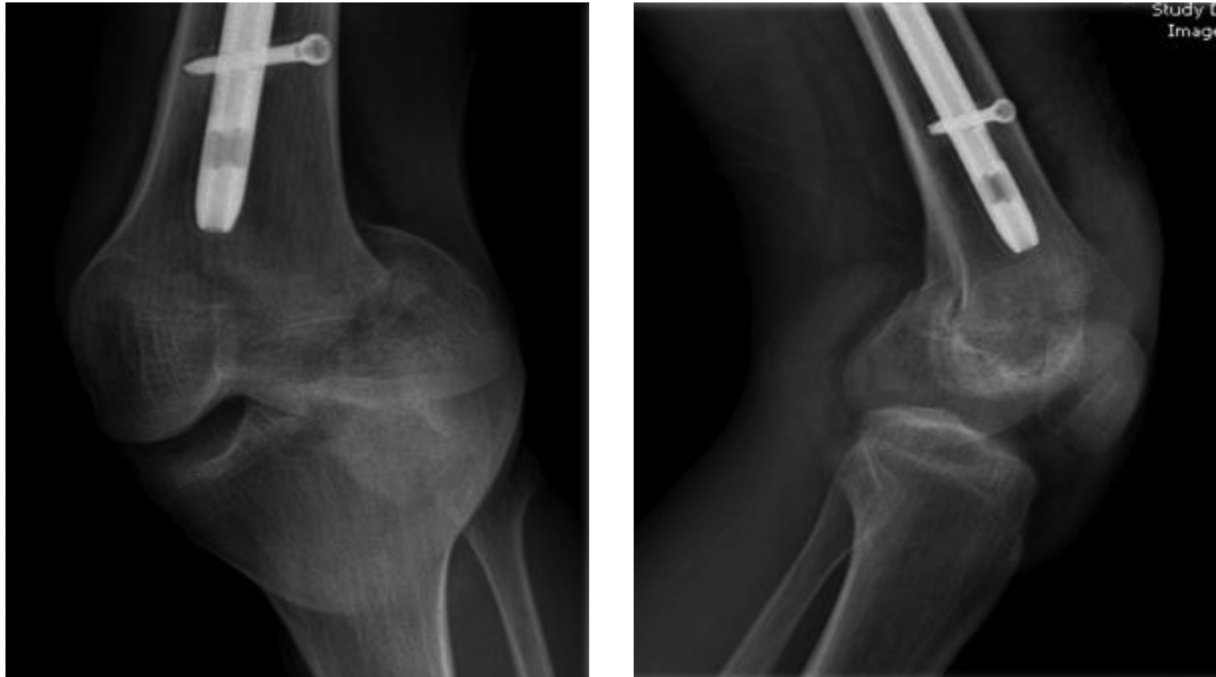


Figure 1. Anteroposterior and lateral radiography of the left knee that shows patellar dislocation and distal femur fracture

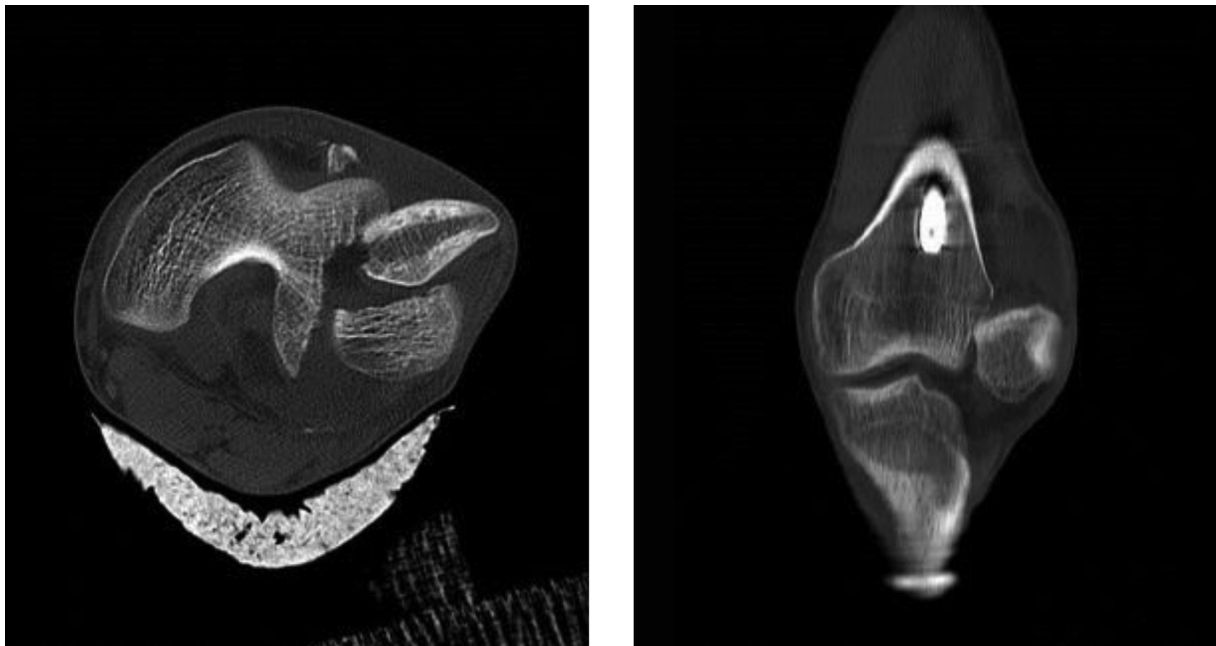


Figure 2. Computed tomography from the left knee; axial and coronal view that shows patellar fracture, MPFL bony avulsion and incarceration patella into lateral Hoffa fracture.

The results of the CT scan also indicated a lateral femoral condyle fracture and also a vertical fracture of the

medial side of the patella. Under sedation, the exterior part of the patella was pushed inward. Because of failed

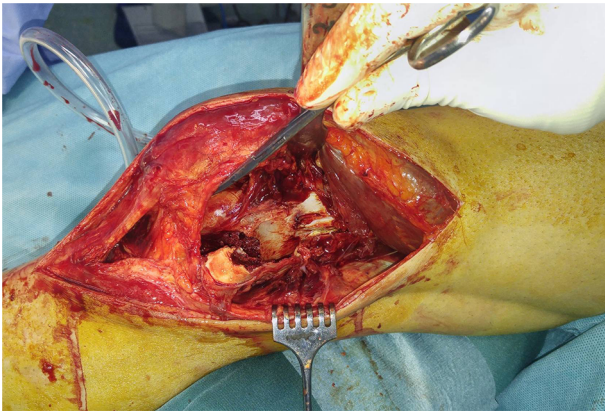


Figure 3. Intraoperative photography from the left knee that shows patella incarcerated into a Hoffa fracture

attempts to reduce the patella through closed techniques, the patient was transferred to the operating room for open reduction.

2.1. Surgical Method

After general anesthesia in supine position and application of tourniquet on the left lower limb, the skin preparation and draping was done. With anterolateral incision on the lateral femoral condyle extending to Gerdy's tubercles, the skin and subcutaneous and joint capsule were opened. The patella was displaced and trapped between condylar fragments. Patellar tendon was intact. Patella was returned to its normal anatomic position and the wound was rinsed. Articular surface was intact. After anatomic reduction, Hoffa fracture fixation was done with three 6.5-mm cannulated screws and the fixation was checked with C-arm. The vertical fracture of the patella, bony avulsion of MPFL, was reduced in anatomical position so this fracture did not require fixation. The drain was applied. Fascia and subcutaneous and skin were sutured in layers. After dressing and knee immobilizer application the patient was transferred to the recovery room.

Knee immobilizer was used in extension and he was allowed to start a crutch walk non-weight bearing and also an early range of motion. We permitted partial weight-bearing after 8 weeks. Within two months after the surgery, a full range of motion was achieved (Figure 4), the patella was completely stable, patellar tracking was perfect, and radiographs demonstrated satisfactory union (Figure 5).

3. Discussion

This case was a young man with dislocation of the patella accompanied by Hoffa fracture in the lateral femur condyle because of a motorcycle accident. Owing to the

incarceration of the patella in lateral femur condyle fragments, the closed reduction technique was not effective. Surgical intervention was required to carry out the reduction of the patella. Incarceration of the patella in lateral femur condyle is a rare happening. However, bony avulsion of MPFL occurs frequently associated with patellar dislocation.

Few articles have described incarcerated patella in a coincident knee fracture. Also, in all of the reported cases, fractures took place on a certain part of the knee (12-14). Different studies have suggested various approaches to place patella (15-17). These approaches are divided into two categories of surgical and non-surgical. Closed technique is the simplest method for reduction of the patella. Non-surgical treatment is employed for the cases with dislocation of the patella, along with other fractures. In the present study, the patient was diagnosed with Hoffa fracture in addition to patella dislocation and incarcerated patella into distal femur fracture. Therefore, surgical treatment was suggested to the patient to place his patella and prevent disturbance of the patellar articular surface.

Generally, accepted indications for surgical intervention consist of evidence of osteochondral fragments and major defects of the parapatellar ligament complex (18). Furthermore, irreducible patellar dislocation due to incarceration in the distal femoral fracture is a well-known indication for open reduction of the patellar dislocation. Hoffa fracture is a rare injury (19) that may occur in the medial or lateral part of the femoral condyle (11). This injury is often a consequence of high velocity and energy trauma (11, 20). It has such a high frequency among motorcycle riders whereas a study reported that among 77 cases of Hoffa fracture, 62 occurred in motorcycle riders (11), while falling from the heights was in the second place (20). The reported patient was also a motorcycle rider, consistent with the other studies.

In our patient, the bony avulsion of MPFL occurred that was reduced after open reduction of the patellar dislocation and anatomic fixation of distal femoral fracture. In addition, this fracture did not require fixation. After two months, the patella was stable and patellar tracking was perfect. This case confirms that dislocation of the patella often occurs among the youth due to accidents. In some rare cases, this dislocation could be accompanied by Hoffa fracture, which might be overlooked easily. This fracture might be associated with incarceration of the patella, leading to difficulties in properly closed reduction.

In such cases, due to a failure in closed techniques, open surgical methods should be implemented. Careful attention to diagnose and manage the associated Hoffa fracture not only saves time but also prevent further complications. If Hoffa fracture fixation and patellar release are brought into prior consideration, better long-term consequences and optimal function of the knee will emerge.



Figure 4. Full range of motion was obtained after 3 months from the surgery. It shows full flexion and extension of left knee.



Figure 5. Early post-operative X-ray from the left knee. lateral and anteroposterior view that Hoffa fracture fixed by three screws and a washer.

We recommend an open reduction of the patellar dislocation in the circumstances, which sustained associated Hoffa fracture because of most likely failure in the closed reduction techniques.

Footnotes

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