

# Open vertical sagittal fracture patella with fracture lateral condyle femur: approach to a rare injury



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**Abstract**

Patellar fracture is a relatively uncommon fracture especially the vertical sagittal type. In cases of high energy trauma injury, it is usually associated with fracture of ipsilateral distal femur or proximal tibia. However, the combination of vertical sagittal fracture patella and ipsilateral fracture lateral condyle is very rare. This necessitates judicious diagnosis and appropriate management to ensure optimal functional outcome. Open reduction and internal fixation is the treatment of choice in managing these types of injuries. This should be followed by gradual mobilization of the affected knee joint. Weight bearing can be started once the fracture starts showing signs of union on X-rays. Literature search shows only one case report describing this pattern. The aim of this case report is to highlight the rarity of this injury, to understand the injury mechanism and surgical approach used for these injuries. The knowledge of this combination will help us manage these injuries so that good functional outcome is achieved.

**Keywords:** Sagittal, Patella, Ipsilateral, Femoral condyle

**Introduction**

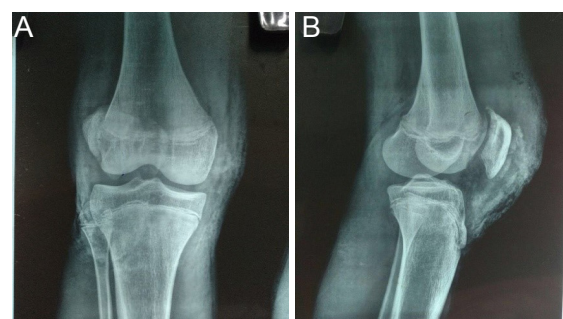
Patellar fracture is a relatively uncommon fracture and vertical fracture patella represents almost 12%-17% of total fractures (1,2). The patellar fracture can be associated with ipsilateral fracture of distal femur or proximal tibia. However, the combination of vertical sagittal fracture patella with fracture ipsilateral lateral femoral condyle is very rare and is being presented in this case report.

**Case Presentation**

A 16-year old boy was presented with swelling and pain in the right knee joint. The patient was travelling in an auto rickshaw when it collided with two wheelers. As a result of collision, the patient had direct impact over right knee joint and was unable to bear weight on affected limb. On examination, the right knee joint was swollen. The tenderness was present on the lateral aspect of femur and over patella. There was a wound of 2 × 2 cm on medial aspect of patella as a result of injury by a sharp iron railing present in the auto rickshaw. The movement of the knee joint was restricted and painful. The distal pulses were palpable and there was no distal neurovascular deficit in the affected limb. The patient was hemodynamically stable and had no other systemic injury. Radiographs were obtained which included anteroposterior (AP) view (Figure 1A) and lateral view (Figure 1B) of the knee joint. The radiographs showed fracture patella along with

fracture lateral condyle femur.

Patient underwent surgical treatment immediately after getting anesthetic clearance. Anterior midline approach for knee joint was used to open the fracture. Both fracture patella and lateral femoral condyle were reduced and fixed with 2 cannulated cancellous screws (CCSs) each (Figures 2A and 2B). Per-operatively some comminution of the patella was present which could be attributed to the direct impact the patient had with the iron railing at the time of injury. The primary wound closure was achieved after doing adequate debridement. Patient underwent extensive physiotherapy with active and passive range of motion exercises post operatively. The patient was allowed partial weight bearing after 2 months of surgery and full



**Figure 1.** (A) X-ray AP view of knee joint showing lateral femoral condyle patella. (B) X-ray lateral view of knee joint showing fracture.





**Figure 2.** Post-operative X-ray (A) AP view and (B) lateral view of knee joint.



**Figure 3.** (A) Full extension of knee joint at final follow up. (B) Complete flexion of knee joint at final follow up.

weight bearing after three months. At the last follow up, the patient had full range of motion and no limb length discrepancy (Figures 3A and 3B). Figure 4 depicts the healed midline incision and scar present on medial side.

### Discussion

Patella fracture is relatively uncommon and represents approximately 0.5%-1.5 % of all bone injuries (1,2). It is more common in men than women (3,4). The transverse type is more frequent (50%-80%) followed by comminuted (30%-35%) and vertical (12%-17%) (2,3). Open patella fracture accounts for 6%-30% of all patella fractures (5,6). Open patella fracture compared with closed fracture is in majority attributed to high-energy trauma such as in car accidents (5,6) and the direct trauma is the main mechanism (3). There is sparse literature available about the incidence of open vertical patella fracture (7).

The unicondylar femur fracture accounts for 0.65% of all fractures of the femur (8). The lateral condyle is fractured more commonly as compared to medial condyle because of the physiological genu valgum. The combination of open vertical sagittal fracture patella and fracture lateral femoral condyle is very rare. To the best of our knowledge only one such similar case has been reported in the literature (9).

This case being road traffic injury is classified as a high energy trauma. The mechanism of injury can be explained as follows. There was a direct trauma to the patella leading to its fracture. The shearing forces produced by the trauma, acting on lateral condyle of femur while the knee was in flexion, led to its fracture. The direct trauma to the knee explains comminution of patella per operatively as well as the wound on medial aspect of knee joint. Clinical examination and proper radiographs are mandatory for diagnosing the injury. A computerized tomography



**Figure 4.** Surgical scar present in midline as well as wound scar present on medial aspect of patella.

(CT) scan will help further in making the diagnosis more accurate.

Open reduction and internal fixation are the treatment of choice for these kinds of fractures. The standard anterior knee approach is used for exposure. The fracture fragments should be clearly identified and reduced with the help of imaging. The fixation of femoral condyle can be done by CCS or buttress plating and that of patella can be done by tension band wiring or CCS. In our case, the fixation was done by CCS in both femur and patella.

### Conclusion

The combination of vertical sagittal fracture patella and lateral femoral condyle is a rare injury. The knowledge of associated probable injuries helps in anticipation and detection leading to appropriate management. There is no substitute for thorough clinico-radiological examination. These fractures should be fixed by operative means. Early mobilization should be done to achieve good long term functional results.

### Ethical issues

Written consent has been taken from the patient and his father to use.

### Authors' contributions

MKA performed the surgery and took clinical and radiological pictures and EM helped in manuscript writing.

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