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Anterior Hoffa Fracture - New Name!

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Abstract

Fractures of the distal end of the femur are usually high-energy injuries and can occur either in the sagittal plane or coronal plane. We present an extremely rare case with fracture of the anterior portion of the lateral femoral condyle in a coronal plane which we termed as "ANTERIOR HOFFA FRACTURE". After initial stabilization, the patient was managed with open reduction, anatomical alignment and rigid internal fixation. On follow-up at 1.5 years, the patient had no pain and achieved a complete range of motion. Open reduction, complete articular alignment and rigid internal fixation is of paramount importance because even a small degree of malunion will lead to maltracking of the patella and early patellofemoral arthritis.

Introduction

Fractures of the distal end of the femur are usually high-energy injuries and can occur either in the sagittal plane or coronal plane, of which sagittal plane fractures are more common than coronal plane fractures [1]. Coronal plane fractures of the distal femur were initially described by Busch in 1869 and later by Hoffa in 1888 were called Hoffa's fracture. The fracture line in Hoffa fracture usually involves posterior femoral condyle (lateral femoral condyle 3 times more common than medial femoral condyle due to physiological genu valgum of the knee joint) [2]. With increasing knee flexion the fracture line will

occur farther from the posterior cortex [3]. The Letenneur classification, computed tomography (CT) classification, the AO classification are widely used to categorize Hoffa fractures and all these classifications describe Hoffa's fracture to the posterior femoral condyle.

We present an extremely rare case with fracture of the anterior portion of the lateral femoral condyle which we termed as "*ANTERIOR HOFFA FRACTURE*"

Case Report

History and Examination

A 24-year-old male patient had a road traffic accident with direct injury to the left distal femur and knee. On examination patient was vitally stable with No Head/ Chest/ Abdominal trauma, Hip and Spine examination was normal. On Local Examination of Left knee - A 5*1 cm lacerated wound (Fig. 1) on the anterior aspect of the left knee with fractured patella bone fragment with fractured distal anterior femur noted, distal neuro vasculature was normal. ATLS protocol was followed and after stabilizing the patient, thorough wound wash was given, intravenous antibiotics were administered as per hospital policy, wound packed and limb splinted.

Fig.1. 5*1cm lacerated wound over the anterior aspect of the left knee

On the radiographic evaluation of the left knee (Fig. 2 & 3), a displaced anterior portion of the lateral femoral condyle fracture (in the coronal plane) with patella fracture was noted.

Fig. 2 & 3. X-ray Left Knee AP and Lateral view indicating displaced fracture of the anterolateral femoral condyle (in the coronal plane) and patella fracture.

Intraoperative

After the pre-anesthetic assessment, the patient was posted for open reduction and internal fixation. Wound margins extended both medially and laterally to adequately expose distal femur fracture and patella fracture (Figs. 4A & 4B) and thorough debridement of the wound was done.

Fig.4A & B. - Fracture of the anterolateral femoral condyle in the coronal plane with communited fracture of the patella

Initially, distal femur fracture was addressed. Clots and debris were removed from the fracture margins using a scoop. The reduction was achieved using a pointed reduction clamp (Fig. 5A) and held temporarily using kirschner wires(K-wires) and fixed using appropriately sized three 4mm partially

threaded cannulated screws in lag mode to secure compression across the fracture (Figs. 5B & 5C). The joint reduction was confirmed under IITV (Fig. 5D). The screw head was countersunk to avoid damage to the opposing articular cartilage.

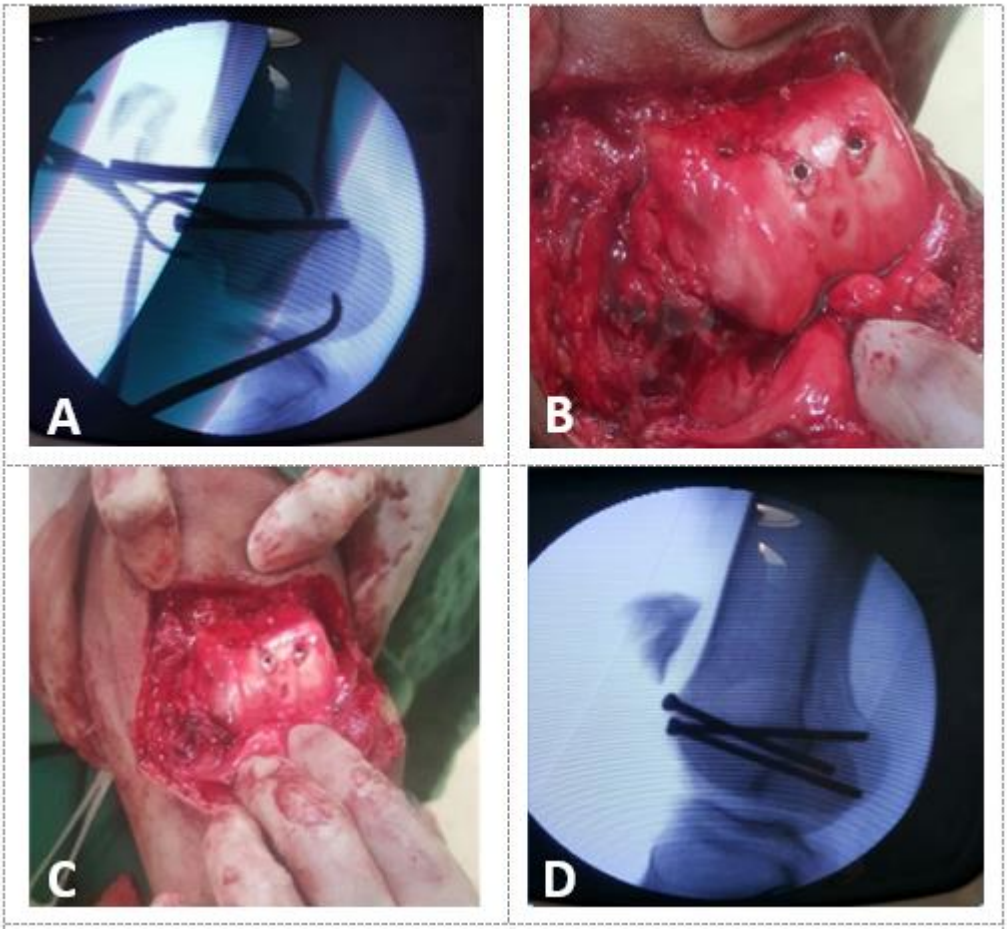

Fig 5: A. IITV image view demonstrating reduction of distal femur fracture using pointed reduction clamp

B & C. Intraoperative view after fixation of distal femur condyle with 3 * 4mm partially threaded cancellous screws.

D. IITV image of fixation of distal femur fracture using 3 * 4mm partially threaded cancellous screws.

For additional stabilization of *ANTERIOR HOFFA FRACTURE*, a 4.5mm Low Contact- Dynamic Compression plate (LC-DCP) was used in neutralization mode with appropriate size screws (Figs 6A & 6B) and then open reduction and fixation of the patella was achieved using 2* 2mm K-wires and 20G wire loop in the figure of 8 tension band principle (Figs. 6C & 6D)

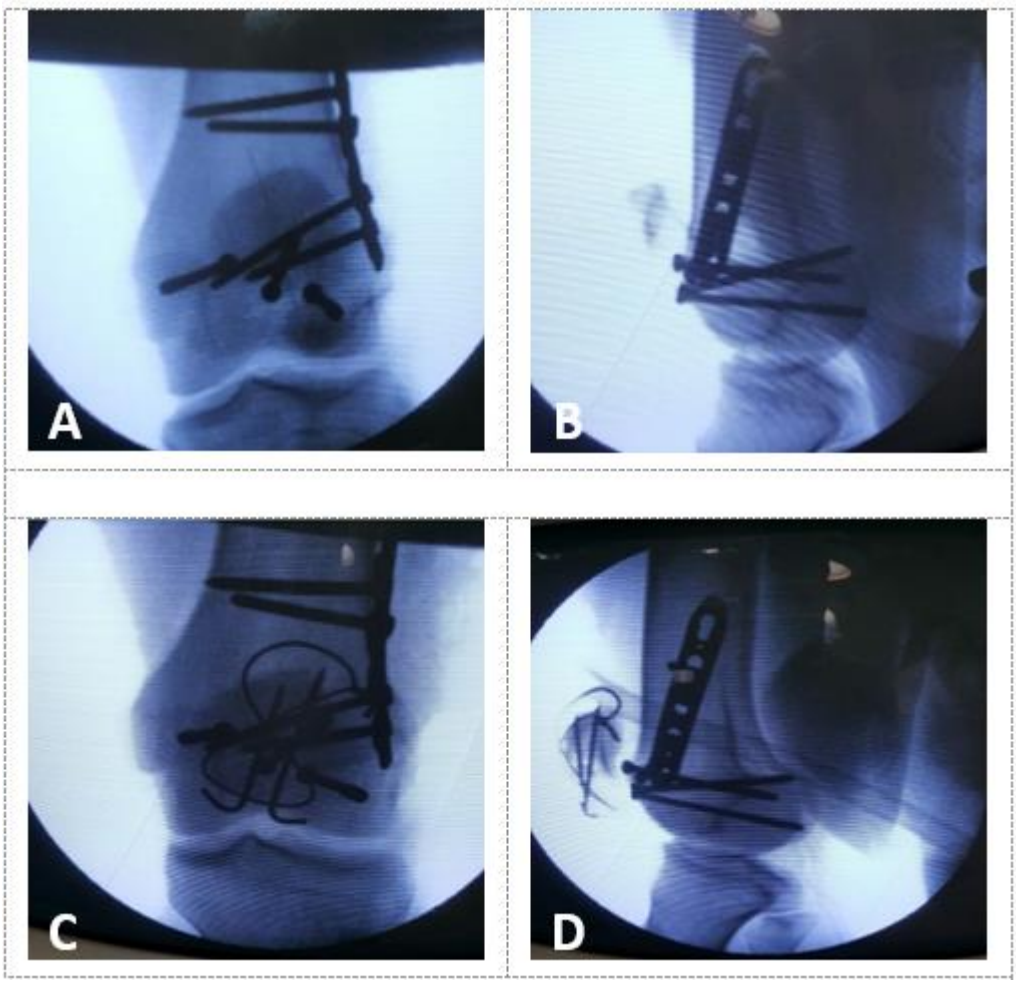

Fig. 6: A & B. AP and Lateral IITV image of distal femur fracture fixation using LC-DCP in Neutralisation mode to stabilize the construct

C & D. AP and Lateral IITC image of Community fracture patella fixed using 2* 2mm K-wires and 20G wire loop

Thorough wash given and patellar retinaculum sutured and the wound closed layerwise. Post-op x-ray of Left distal femur with patella showed excellent tibiofemoral and patella-femoral joint reduction (Fig. 7A & 7B)

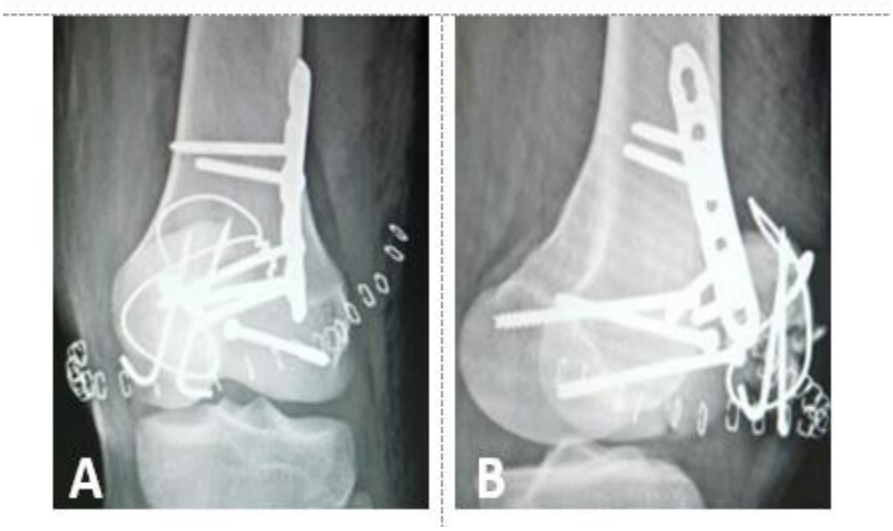

Fig. 7A & B. Post-op Xray Left AP and Lateral View Distal Femur with patella

Postoperatively- Knee was immobilized for initial 24-48 hours for oedema to subside. The negative suction Drain was removed on day 2. Stitch removal was done on day 14. Initially, passive knee joint movement was allowed and then gradually active movements were initiated. The patient was initially Non-weight bearing for 8-10 weeks then partial weight-bearing for 4 weeks and then full weight bearing.

On Follow up at 1.5 years, the patient achieved full range of motion with no restriction (Fig. 9) or pain and an X-ray of the Left distal femur and patella showed complete union with normal articular congruity (Fig.8A & 8B).

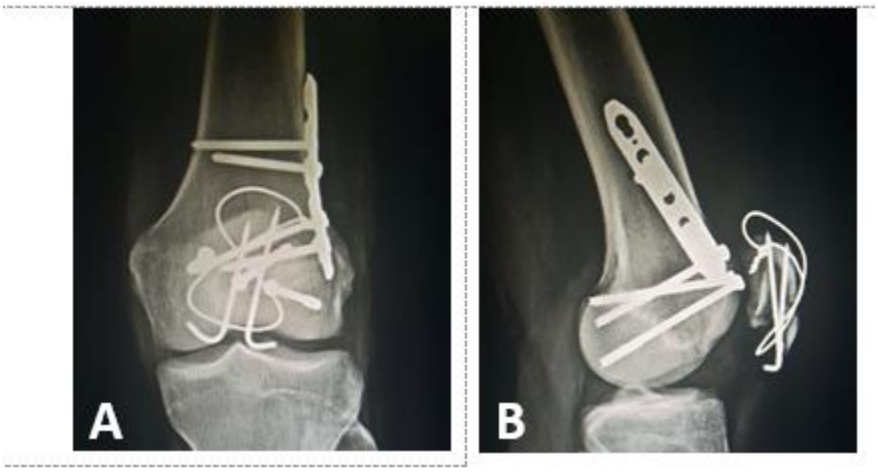

Fig. 8A & B. Xray Left AP and Lateral View Distal Femur with patella

Fig. 9 A, B, C, D. 1.5 year Follow up. Full Range of motion.

Learning Points

1.Fracture of the Antero-lateral femoral condyle (ANTERIOR HOFFA FRACTURE) in the coronal plane is an extremely rare injury and very limited literature and cases exists on Antero-Lateral Femoral condyle fracture

2.The mechanism of injury is different from that of Hoffa"s fracture. In ANTERIOR HOFFA FRACTURE there is direct injury to anterolateral femoral condyle resulting in shearing of the anterior portion of lateral femoral condyle while in Hoffa's fracture the force vector is transmitted from tibial plateau to posterior femoral condyle resulting in shearing of posterior femoral condyle [3].

3.ANTERIOR HOFFA FRACTURE can be easily missed on AP radiographs (Fig. 2), so it is very important to get both AP and Lateral views and when in doubt to get a CT Scan done.

4.It is important to distinguish Anterior Hoffa's fracture from Osteochondral fractures because management differs.

5.Open reduction and perfect anatomical alignment with rigid internal fixation are necessary. Even a small degree of malunion will lead to maltracking of the patella and early patellofemoral arthritis.

Conflict of Interest -The authors declare no conflicts of interest.

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