

Medial Hoffa's Fracture Treated with Subvastus Approach – Case Series

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Learning Point of the Article:

Early CT-based diagnosis and anatomical fixation are critical for restoring knee joint congruity in medial Hoffa's fractures. This series highlights varied presentations and management approaches to optimize patient outcomes.

Abstract

Introduction: Medial Hoffa's fractures are rare coronal plane fractures of the distal femur, often missed on initial radiographs. Early diagnosis and anatomical fixation are essential for good functional recovery.

Case Report: We present three cases of medial Hoffa's fracture in adult patients following high-energy trauma. All were diagnosed using computed tomography scans. Surgical fixation was performed using headless compression screws through a subvastus approach. Post-operative rehabilitation protocols varied slightly, but all patients achieved satisfactory union and function by 6–9 months.

Conclusion: High suspicion, advanced imaging, and stable fixation are vital for optimal outcomes in medial Hoffa's fractures. Consistent anatomical reduction across cases resulted in excellent functional recovery.

Keywords: Medial Hoffa's fracture, distal femur, coronal fracture, internal fixation, subvastus approach.

Introduction

Medial Hoffa's fractures, first described by Albert Hoffa in 1904, are extremely rare injuries involving the coronal plane of the medial femoral condyle [1,2,3]. They typically result from high-energy trauma such as road traffic accidents and may be missed on plain radiographs [4,5,6,7]. Untreated or malreduced fractures can lead to poor outcomes due to articular incongruity and instability [5,8,9].

and presented with knee swelling, medial joint line tenderness, and restricted range of motion. Initial radiographs demonstrated a subtle coronal fracture line of the medial femoral condyle (Fig. 1). Computed tomography (CT) imaging confirmed an isolated medial Hoffa's fracture without comminution (Fig. 2). The fracture was managed surgically using a medial parapatellar approach, and fixation was achieved with two anterior-to-posterior headless compression screws. Post-operative radiographs demonstrated anatomical reduction and stable fixation (Fig. 3). At 6-month follow-up, the patient achieved a painless knee range of motion from 0° to 120° with radiological evidence of union.

Case Report

Case 1

A 35-year-old male sustained a high-energy road traffic accident

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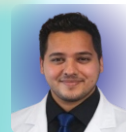
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Figure 1: Pre-operative anteroposterior knee radiograph – case 1.

Case 2

A 42-year-old female sustained a fall from height and presented with swelling, medial knee pain, and inability to bear weight. Plain radiographs suggested a minimally displaced medial condylar fracture (Fig. 4). CT scan confirmed a medial Hoffa’s



Figure 3: Post-operative anteroposterior and lateral radiographs – case 1.

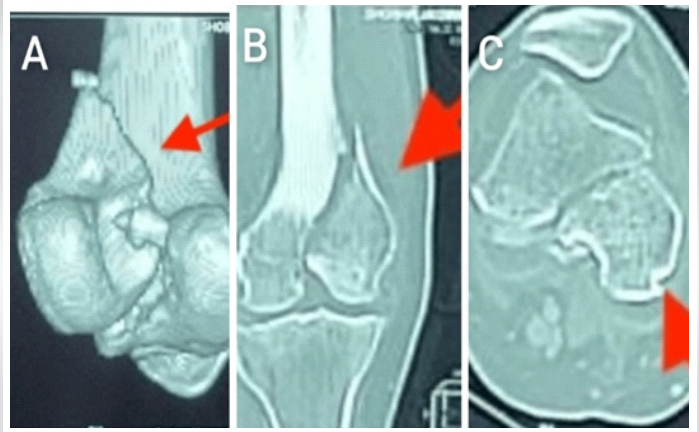


Figure 2: Computed tomography scan confirming medial Hoffa’s fracture – case 1.

fracture with minimal displacement (Fig. 5). Open reduction and internal fixation were performed through a medial parapatellar approach using three cannulated screws to enhance stability. Post-operative radiographs confirmed satisfactory fixation (Fig. 6). The patient was allowed progressive weight-bearing and achieved a knee range of motion of 0°–125° at 7 months.

Case 3

A 28-year-old male sustained a motorcycle accident and presented with knee effusion and medial joint line tenderness. Radiographs demonstrated a medial condylar fracture (Fig. 7), and CT imaging revealed a comminuted medial Hoffa’s fracture



Figure 4: Pre-operative X-ray showing anteroposterior and lateral radiographs – case 2.

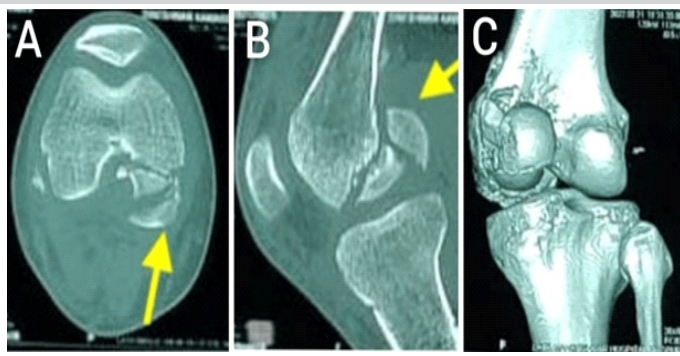


Figure 5: Computed tomography scan showing fracture pattern – case 2.

(Fig. 8). Due to comminution, anatomical reduction was supplemented with screw fixation and plate augmentation to resist shear forces. Post-operative radiographs confirmed stable fixation (Fig. 9). Fracture union was achieved by 5 months, and the patient returned to pre-injury activity levels by 9 months.

Discussion

Medial Hoffa’s fractures are an uncommon subset of distal femur fractures [1,2,3], representing a coronal plane injury that can be easily missed on standard anteroposterior and lateral radiographs. Their rarity, combined with subtle presentation, often delays diagnosis [5,6]. These fractures typically occur due to high-energy mechanisms such as road traffic accidents or falls from height, where an axial load is transmitted through a flexed knee [4,6,7]. The resultant shear forces across the condyles

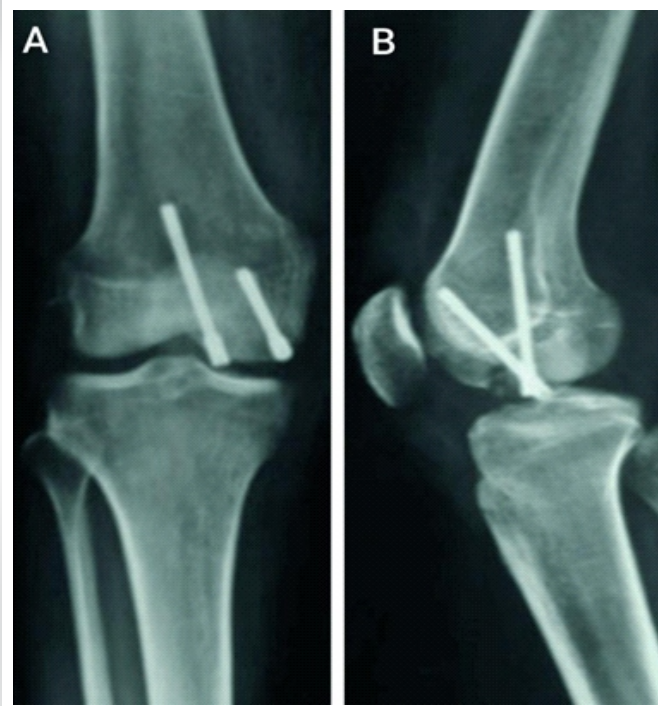


Figure 6: Post-operative radiograph – case 2.

cause intra-articular separation, which, if left untreated or inadequately fixed, may result in joint incongruity, instability, and early post-traumatic arthritis.

CT imaging plays a pivotal role in identifying fracture orientation, degree of displacement, and associated

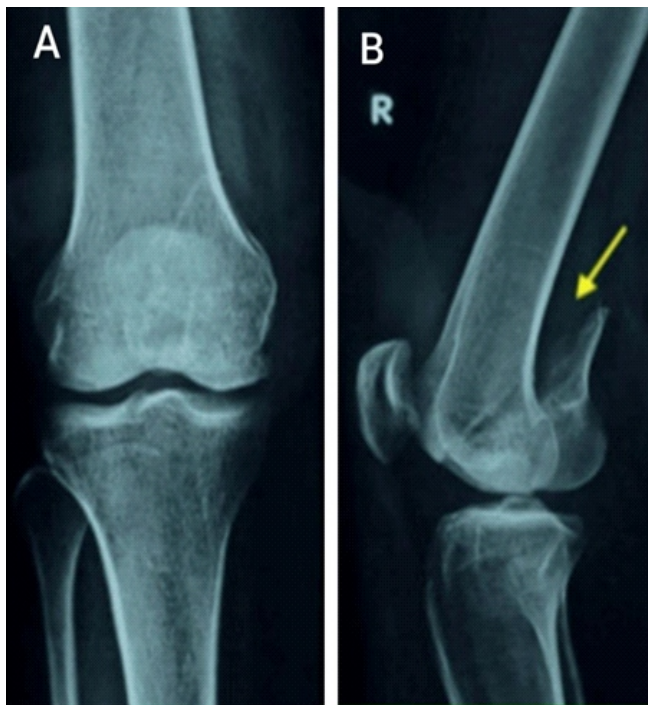


Figure 7: Pre-operative X-ray showing anteroposterior and lateral radiographs – case 3.

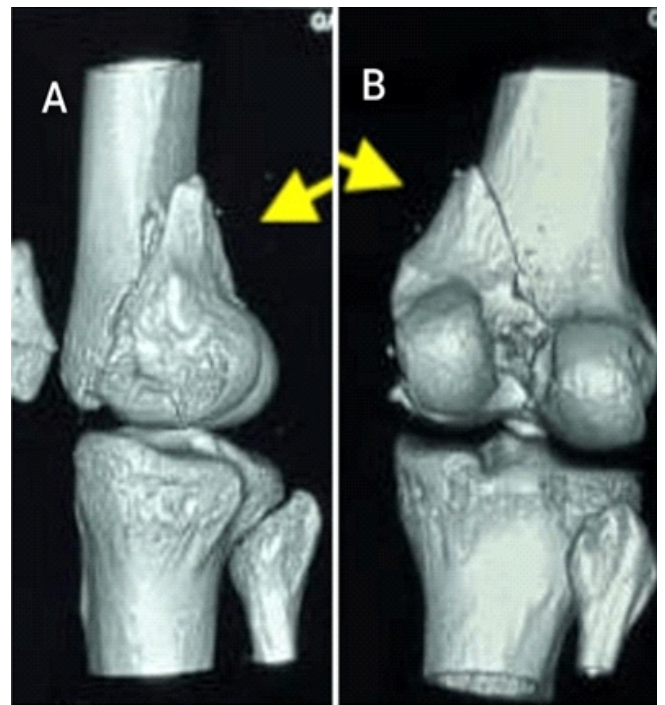


Figure 8: Computed tomography scan showing comminution – case 3.

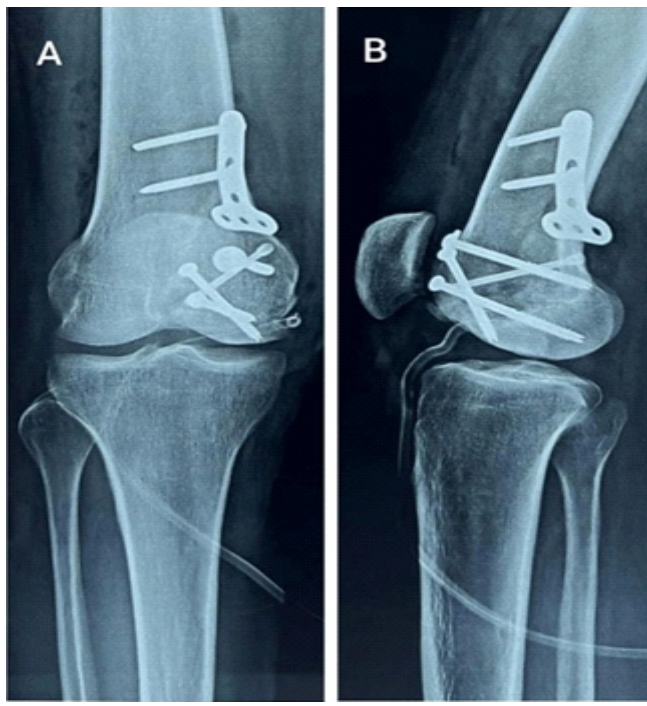


Figure 9: Post-operative radiograph with plate augmentation – case 3.

comminution, allowing precise surgical planning [6,7,10]. Our case series highlights that, irrespective of patient age or fracture pattern, surgical management remains the gold standard [5,11,10]. The choice of surgical approach depends on the condyle involved: A medial parapatellar or subvastus approach provides optimal visualization for medial condyle fractures [12], while a lateral parapatellar approach is suited for lateral condyle injuries. Bicondylar variants may require combined exposures.

In our series, fixation with headless or cannulated screws ensured rigid stability, while plate augmentation was valuable in

the comminuted case to resist shear forces and prevent collapse [5,10]. Early mobilization was possible in all cases due to the stable constructs, which is critical in preserving knee range of motion and preventing stiffness. The outcomes reinforce that meticulous anatomical reduction, stable fixation, and a structured rehabilitation protocol are the cornerstones for achieving pain-free function and avoiding long-term degenerative changes. Several previous studies have described unicondylar femoral fractures and their management strategies [13,14,15,16].

Conclusion

Hoffa fractures of the distal femur are rare, high-energy injuries involving the coronal plane of one or both condyles. They are often missed during routine assessment and demand a high index of suspicion, especially in patients with axial load on a flexed knee. CT imaging should be used to confirm the diagnosis and plan surgical management. Non-operative treatment is rarely indicated; the current standard is open reduction and internal fixation, using approaches tailored to the condyle involved. Appropriate fixation with screws and plate augmentation when required ensures anatomical reduction, joint stability, and favorable long-term outcomes.

Clinical Message

Medial Hoffa's fractures, though rare, must be actively ruled out in all high-energy distal femur injuries. CT imaging is crucial for diagnosis, and timely anatomical fixation – preferably with screws and plate augmentation if needed – ensures joint stability, prevents arthritis, and restores full function.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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