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Missed Medial Condyle Hoffa Fracture in a Case of Lateral Condyle Hoffa Fracture

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Learning Point of the Article:

It is very important to carefully scrutinize the computed knee tomography in a case of unicondylar Hoffa fracture, to rule out bicondylar involvement.

Abstract

Introduction: The Hoffa fracture is an uncommon coronal plane fracture involving the femoral condyles. The coronal nature of the fracture makes it hard to diagnose clinic-radiologically.

Case Report: A 42-year-old male patient developed pain associated with swelling in his right knee after a two-wheeler accident. He consulted his general practitioner who missed the Hoffa fracture on plain radiographs and treated him conservatively with analgesics. The pain did not subside and he visited our emergency department where a computed tomography (CT) scan revealed a Hoffa fracture of the lateral condyle. He was taken up for open surgery, and while fixing the lateral condylar fracture, we found an undisplaced medial condylar Hoffa fracture of the ipsilateral femur. This fracture was initially missed on the CT scan. Both the fractures were internally fixed and the patient was put on rehabilitation. At the end of the 6-month follow-up, the patient had a full knee range of motion.

Conclusion: Careful and detailed CT imaging and looking for fractures other than Hoffa is important, so as not to miss any associated bony injuries. Furthermore, the treating surgeon needs to look for other bony injuries during open or arthroscopic fixation of Hoffa's fracture.

Keywords: Hoffa, bicondylar, fracture, missed, intraoperative, CT.

Introduction

Hoffa fractures account for <1% of the fractures involving the distal femur [1]. These fractures usually occur after high-energy trauma and involve the posterior femoral condyles in the coronal plane. The displaced fracture pattern of the lateral condyle was first mentioned by Hoffa in 1904, thus named accordingly [2]. The muscular pull by the popliteus and gastrocnemius makes these fractures unstable and they tend to heal with a valgus (lateral condyle Hoffa #) or varus (medial condyle Hoffa#) deformity, if not managed appropriately [1]. Hence the treating physician should be very cautious not to miss these fractures as they tend to get displaced and get malunited if not internally fixed [3]. We report a case of lateral condylar Hoffa fracture with a missed medial condylar Hoffa fracture on pre-operative radiological imaging.

Case Report

A 42-year-old male patient came to the emergency department of a primary care center after being hit by a car while traveling on a two-wheeler. He managed to walk after a fall but, complained of pain and swelling of the right knee and was prescribed analgesics

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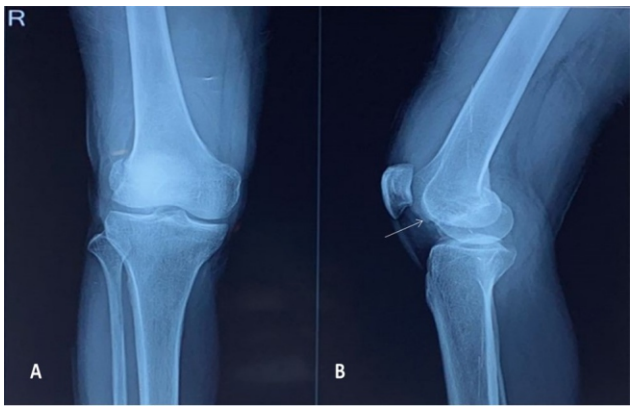

Figure 1: (a and b) The plain radiographs with Hoffa fracture of lateral condyle indicated by white arrow.

Figure 2: (a-c) Sagittal and axial CT images with # lateral condyle indicated by a white circle and an intact medial condyle by a red circle.

and was sent home. On the following day, he visited our outpatient department as he experienced excruciating right knee pain. He was evaluated with plain radiographs and a diagnosis of Hoffa's fracture was suspected (Fig. 1).

A computed tomography (CT) scan confirmed the diagnosis of a displaced posterior lateral condyle distal femur fracture (Figs. 2 and 3).

He was then operated through a lateral parapatellar approach and a lateral parapatellar arthrotomy was performed. This revealed a laterally displaced Hoffa's fracture and to our surprise a medial undisplaced Hoffa fracture. There was no damage found to the cartilage, menisci, and the ligaments intraoperatively. The medial condylar fracture was quite unexpected and a review of the CT scans revealed a faint fracture line on the axial section of the medial femoral condyle. The Lateral Hoffa's fracture as well as the medical condylar fracture was reduced and internally fixed with 6.5 mm cannulated partially threaded cancellous screws (Figs. 4 and 5). The patient was mobilized on the 1st post-operative day with intermittent knee mobilization and isometric muscle strengthening exercises of the knee. Partial weight bearing was started from 7th post-operative week and by the end of 4th post-operative month, full independent weight bearing had been started. He was put on a knee range of motion brace till 4-month post-surgery. He was having full knee range of motion at the end of 6-month post-operative period with complete radiological fusion at 9-month post-operative period (Figs. 6 and 7).

Discussion

The lateral condylar Hoffa fracture is commoner than the medial counterpart and the bi-condylar Hoffa fractures are very rare [4]. These fractures usually occur after road traffic

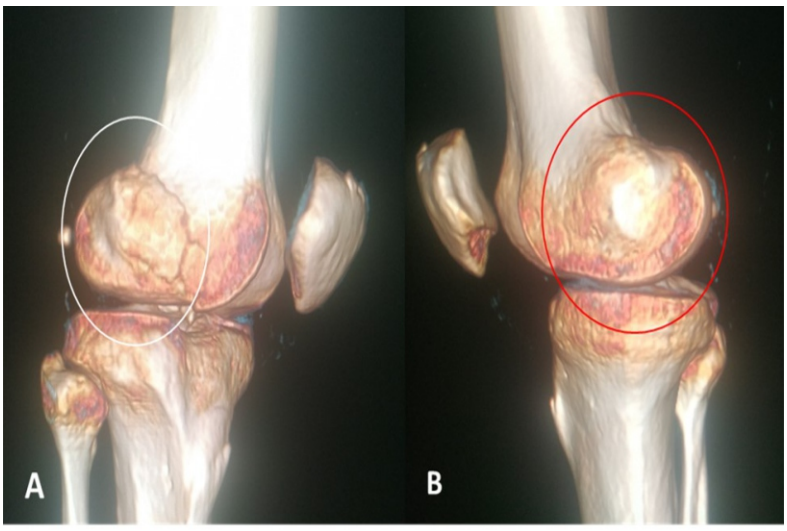

Figure 3: (a and b) 3d reformatted CT images with # lateral condyle indicated by a white circle and an intact medial condyle by a red circle.

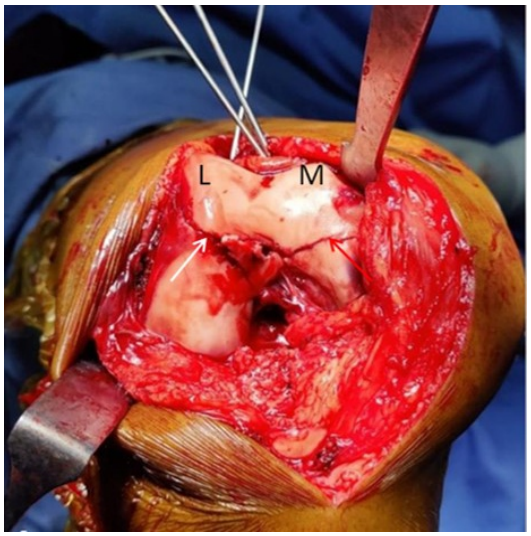

Figure 4: The intraoperative picture of the right knee with Hoffa fractures in both the lateral condyle (L) and the medial condyle (M) indicated by white and red arrows, respectively.

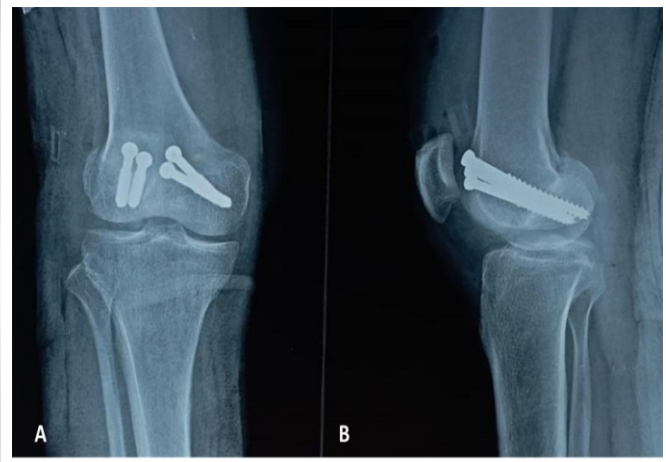

Figure 5: (a and b) The post-operative radiograph with screws in situ.

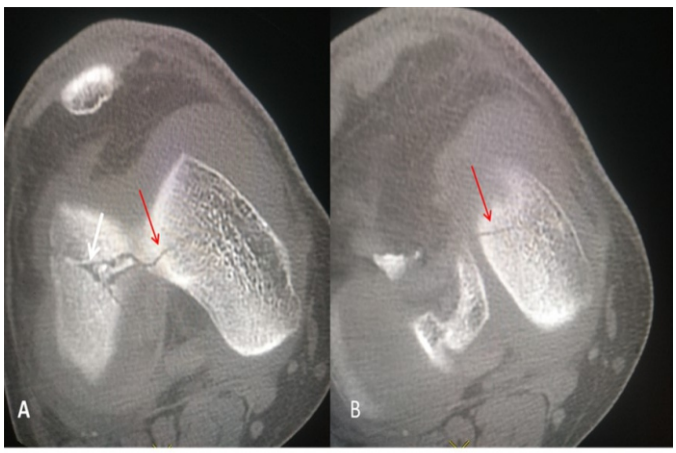

Figure 6: The lateral condyle Hoffa # (white arrow) extending in to the medial condyle (red arrow) which was initially missed.

Figure 7: Full range of motion at the end of 6-month post-operative.

Figure 8: Good radiological fusion at the end of 9-month post-operative period.

accidents and are mostly seen in young individuals. The Hoffa fracture is obscured on the anteroposterior plain radiograph by the intact anterior condyle and hence gets easily missed despite the presence of clinical findings suggesting a distal femur fracture [5]. Moreover, a bicondylar Hoffa fracture can easily be missed on plain radiographs and a three-dimensionally reconstructed CT imaging is usually advocated for not missing those injuries [6]. In our case, the medial condylar Hoffa was not appreciable even on 3D reconstruction imaging and is incidentally identified intraoperatively. We then retrospectively reviewed the imaging and noticed a very faint fracture line in the axial CT imaging (Fig. 6).

To date, there is only a handful of cases reported in the literature with bicondylar Hoffa fractures [7, 8, 9, 10, 11, 12]. However, in all these cases published in the literature, the bicondylar Hoffa fractures were very obvious in the pre-operative imaging performed. Magnetic resonance imaging is not routinely done at our setup for traumatic fractures, and had it been done we might have diagnosed the bicondylar Hoffa fracture preoperatively. Our case is unique in that both the radiologist and the operating surgeon missed the faint fracture of the medial condyle on pre-operative imaging. High clinical suspicion and CT imaging (conventional and 3D reconstructed) and internal fixation provide better outcomes for these injuries. It has become prudent for the surgeon to look for associated injuries intraoperatively.

Conclusion

Hoffa fractures are relatively rare and can be easily missed radiologically. Careful and detailed CT imaging and looking for fractures other than Hoffa's are important so as not to miss associated bony injuries. The treating surgeon needs to look for other bony injuries during open or arthroscopic fixation of Hoffa's fracture.

Clinical Message

A CT scan is always warranted whenever a Hoffa fracture is clinically suspected. The radiologist and the treating surgeon should always be skeptical to rule out a bicondylar Hoffa in an obviously unicondylar Hoffa fracture by detailed evaluation of the CT imaging.

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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