

# An Unusual Presentation of Chaput Tubercle Fracture with Coexisting Bimalleolar Component Involving Lateral and Posterior Malleoli: A Case Report

Prem Kumar Kothimbakkam<sup>1\*</sup>, Vijayashankar Murugesan<sup>1</sup>, Bharath Vadivelkumar<sup>2</sup>,  
Esa Gokulakrishnan<sup>3</sup>

<sup>1</sup> Professor, Department of Orthopedics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Tamil Nadu, India

<sup>2</sup> Assistant Professor, Department of Orthopedics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Tamil Nadu, India

<sup>3</sup> Postgraduate, Department of Orthopedics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Tamil Nadu, India

\*Corresponding author: Prem Kumar Kothimbakkam; Department of Orthopedics, Chettinad Hospital and Research Institute, Chettinad Academy of Research and Education, Kelambakkam, Tamil Nadu, India. Tel: +91-9840544411; Email: drpremkumar.kvk@gmail.com

Received: 05 April 2024; Revised: 11 June 2024; Accepted: 08 July 2024

## Abstract

**Background:** Chaput tubercle fracture is a counterpart to adolescent Tillaux fracture, which occurs at the anterolateral part or the attachment site of the antero-inferior tibiofibular ligament on the distal tibia. It is rare, and its presentation may not be well appreciated in X-rays, which depicts the importance of a computed tomography (CT) scan of the ankle to reveal the same.

**Case Report:** A 25-year-old gentleman presented to Chettinad Hospital, India, casualty with acute onset of pain, swelling, and restricted movements at the ankle joint following a road traffic accident. Ankle CT revealed a Chaput fracture along with a bimalleolar fracture (posterior and lateral malleoli). The complex displaced fracture was managed with open reduction internal fixation (ORIF) with plate osteosynthesis for the posterior malleoli and lateral malleoli, and tension band wiring was done for the Chaput tubercle fracture. At the end of two-year follow-up, the patient was able to mobilise without any support.

**Conclusion:** Through this case report, we would like to enumerate the rarity of Chaput tubercle fracture associated with bimalleolar fracture of the ankle, which will be evaluated better with a CT evaluation in the first place. At the same time, it gives valuable information for the preoperative surgical plan.

**Keywords:** Case Reports; Ankle Fractures; Ankle

**Citation:** Kothimbakkam PK, Murugesan V, Vadivelkumar B, Gokulakrishnan E. **An Unusual Presentation of Chaput Tubercle Fracture with Coexisting Bimalleolar Component Involving Lateral and Posterior Malleoli: A Case Report.** *J Orthop Spine Trauma* 2024; 10(3): 139-41.

## Background

Ankle fractures commonly cause major damage to the ligaments and the surrounding soft tissues, impairing the ankle joint function and its stability. Ligament injury must be fully treated simultaneously with anatomic reduction and fixation of the fracture internally for the best results. This makes surgical intervention necessary in situations of instability since the distal tibio-fibular syndesmosis is essential for preserving the congruency of the ankle and its integrity (1).

Chaput tubercle fracture, also considered a counterpart to adolescent Tillaux fracture, occurs at the tibial side attachment of the anterior inferior tibiofibular ligament (AITFL). The AITFL is one of the various ligaments in the ankle joint and is very important for preserving stability. Chaput tubercle fracture leads to the distal tibiofibular syndesmotom instability, which acts as the ligament attachment site (often known as “Chaput fractures”). The ligament is typically expected to rupture in an adult before the avulsion fracture of the anterior-inferior section of the tibial plafond. As a result, the Chaput tubercle fracture, which is an avulsion fracture of the antero-inferior section of the distal tibia rather than a ligament tear, is a rare event (2).

Although many methods of Kirschner wire (K-wire) and screw attachment have been used in the past, tension band wiring has shown to be a more dependable and sturdier alternative because of its greater fixation strength. Through

this case report, we hope to raise awareness of Chaput tubercle fractures that coexist with bimalleolar fractures as well as the value of ankle computed tomography (CT) scans in patients with ankle fracture because they may disclose the Chaput tubercle that was missed by the first X-rays, and also the management of the same.

## Case Report

A 25-year-old gentleman came to the casualty after a road traffic accident. The patient experienced a skid and fall from a 2-wheeler, sustaining an injury to his left ankle. He had complaints of swelling and pain over the left ankle. On examination, tenderness and swelling were present over the lateral malleoli of the left ankle with a restricted range of movements at the ankle joint. No associated history of loss of consciousness, vomiting, or seizures was noted. Anteroposterior (AP), lateral, and mortise X-ray views (Figure 1) were carried out, which revealed the presence of a distal 1/3<sup>rd</sup> comminuted fracture of the fibula along with an intra-articular fracture of the posterior segment of tibial-plafond.

In view of this complex fracture, a CT scan of the ankle joint was done (3). Surprisingly, the CT (Figure 2) showed the presence of an added intra-articular fracture of the anterolateral distal tibia; in other words, known as the Chaput tubercle fracture with anterolateral displacement, a flake fracture segment measuring the size of 2-3 mm lay immediately adjacent to the main fracture site (4).





Figure 1. Pre-operative X-rays showing bimalleolar component

**Management:** Informed consent was obtained from the patient, and surgical intervention was planned. The posterior approach was employed, and open reduction internal fixation (ORIF) of lateral malleoli (anatomical fibular plate) and posterior malleoli (1/3<sup>rd</sup> tubular plate) was done intra-operatively.



Figure 2. Computed tomography (CT) showing the Chaput tubercle fragment fracture

Using the anterolateral approach, the Chaput fracture fragment was reduced using point-reduction forceps.

Intra-operatively, 1.2 mm K-wires were used to fix the fracture end of the Chaput fragment, and we anchored 0.8 mm stainless steel, which was looped in a figure-of-eight fashion (5) around a cancellous fully-threaded screw (4.0 mm) to prevent fracture rotation and aid compression and anatomical reduction of the fracture (6) (Figure 3).

Post-operatively, a below-knee slab was applied for three weeks. Sutures were removed post-operative day 12, and ankle range of motion (ROM) was started by the end of 2 weeks. By six weeks, partial weight-bearing was started after callous formation was visualized, and full weight-bearing was initiated after solid union at the end of 10 weeks.



Figure 3. Immediate post-operative X-rays showing fixation of distal fibula plate for fibula, semi-tubular plate for posterior malleoli and tension band wiring of Chaput fragment

**Follow-up:** The patient was followed up for two years. Figure 4 shows the one-year follow-up X-rays.



Figure 4. One-year follow-up X-rays

At the end of 2 years, the patient had satisfactory clinical and radiological results (Figures 5, 6). The patient was able to resume back to normal daily activities.

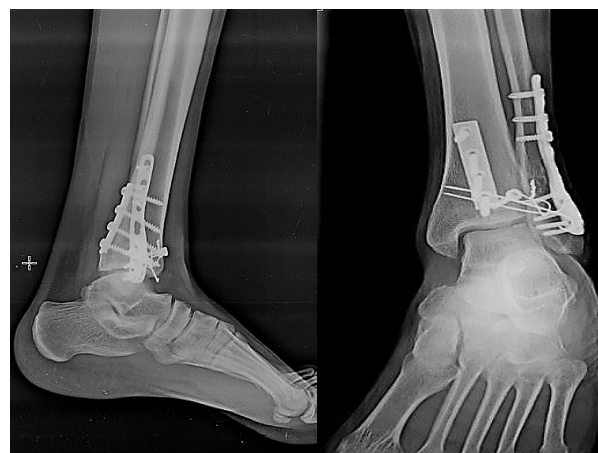


Figure 5. Two-year follow-up X-rays showing maintained ankle joint alignment with implants in situ



**Figure 6.** Two-year follow-up clinical outcome of patient doing full ankle range of movements

## Discussion

This discourse enumerates the rarity of the fracture combination as there is involvement of Chaput component with bimalleolar fracture. Although there are classifications depicting the fracture based on the foot position and the force, there are no classifications based on the fracture pattern and imaging. Mishra et al. reported that an isolated Chaput fracture was an unusual fracture that was enigmatic to diagnose with only conventional radiological investigations (7).

Kummer and Crevoisier reported a novel approach to visualize and fix the posterior lateral malleoli along with anterolateral parts of the ankle in a single approach. The study was done between January 2019 and January 2021 and had a total incidence of 20 cases which enumerates the rarity of the fracture (8). Chaput fracture involving other malleoli has been scarcely reported. The rarity involved in this combination of fractures enlightens the uniqueness and the perplexity involved in fracture fixation. The purpose of this paper is to outline the significance of identifying fractures in X-rays based on their elusiveness (9). However, diagnosing only with one investigative modality (X-ray) as opposed to diagnosing thoroughly with a higher investigative modality (CT scan) proves the complexity of the fracture pattern and its inconspicuousness. Based on the AO classification, there are no mentions of the Chaput fracture to suggest/mention such unique fractures in the future (10).

## Conclusion

The number of Chaput fractures with bimalleolar components is almost a rarity owing to the reduced number of fractures reported, which elucidates the lower incidence rate of this unique fracture combination.

## Conflict of Interest

The authors declare no conflict of interest in this study.

## Acknowledgements

This study received no funding.

The authors certify that they have obtained all appropriate consent forms. In the form, the patient gave his consent for his images and other clinical information

to be reported in this journal. The patient understood that their names and initials would not be published and that due efforts would be made to conceal their identity.

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