

A Rare Case of Talus Neck and Open Medial Malleolus Fractures with Ankle Subluxation Treated using a Single Anteromedial Approach

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Learning Point of the Article:

Early Surgical Intervention Is Critical: For complex talar neck fractures with open malleolar injuries and ankle subluxation, surgery within 10–12 hours minimizes infection and avascular necrosis risk. Single Anteromedial Approach When Feasible: This approach can provide adequate exposure for fixation, especially when extending from an existing open wound, but should be tailored to soft tissue condition and fracture pattern.

Abstract

Introduction: Talus fractures are uncommon and complex injuries associated with significant trauma and complications. The incidence of associated malleolar injury with talus fracture is rare.

Case Report: We share this unusual case of a Hawkins type-3 talus neck fracture along with a serious Grade 3B medial malleolus fracture and ankle subluxation, which was treated with cleaning the wound, realigning the ankle, and surgery to fix the bones. Post-operatively, the wound was healthy and free of infection. Despite being told to avoid weight-bearing for three months, the patient lost follow-up after a month and started occasional partial weight bearing. During the 10th post-operative week, we found a mild degree of talar neck collapse and Hawkins sign radiologically. The range of motion for the ankle was dorsiflexion of 0–15° and plantar flexion of 0–30°, with minimal swelling and pain on weight bearing.

Conclusion: This case highlights the rarity and complexity of a talar neck fracture with ipsilateral medial malleolar fracture and ankle dislocation. Positive early outcomes were achieved through timely surgery within 10 h, careful soft tissue management, and appropriate fixation. The presence of a partial Hawkins sign post-operatively indicated preserved talar vascularity and reduced risk of avascular necrosis.

Keywords: Rare case of talus neck and medial malleolus fractures, compound injury, single anteromedial approach, ankle subluxation, good surgical outcome.

Introduction

Fractures of the talar neck and body are uncommon and frequently associated with high-grade injury and poor outcomes. The incidence of talar fractures is 0.3%, while talar body fractures account for 60% of all talar fractures [1,2]. Talar neck fractures are known to have a significant incidence of complications, such

as avascular necrosis, collapse, and malunion [1,3]. We describe a rare case of talar neck and open grade 3B medial malleolar fractures that were successfully surgically managed.

Case Report

A young male in his 30s, from a lower-middle-class

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Author's Photo Gallery



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Figure 1: Clinical picture of the medial aspect of the ankle with a deep lacerated wound on the medial aspect of the ankle joint with exposed muscles, stripped periosteum.

socioeconomic background, presented to our hospital with complaints of severe pain, significant swelling, and bleeding in the left ankle joint with an alleged history of slipping and falling from a tractor 3 h after injury. Both the Glasgow Coma Scale and the patient's vital signs were within normal limits. There was no history of head trauma, vomiting, or ear, nose, or throat bleeding. Physical examination revealed a deformed ankle with a deep lacerated wound on the medial aspect of the ankle joint with exposed muscles, stripped periosteum with no signs of distal neurovascular injury, and ligamentous instability. Ankle movements were painful and there is no tenderness over the

subtalar joint, hind and midfoot regions (Fig. 1).

Investigations

The anteroposterior and lateral x-rays showed a fractured talar neck in the left foot, with the ankle joint partially subluxated and a broken medial malleolus. Due to severe pain, the patient refused to consent to a closed reduction procedure. Due to personal considerations, the patient chose not to have computed tomography (CT) and magnetic resonance imaging (MRI) scans (Fig. 2).

Treatment

The patient underwent emergency surgery within 10 h of injury due to ankle subluxation and talus neck fracture. Using spinal anesthesia, a 5 cm skin incision made on the anterior and inferior part of the ankle joint toward the talo-navicular joint, extending from the previously open wound over the medial malleolus. We retracted the distal fragment of the medial malleolus along with its intact deltoid ligament inferiorly to expose the ankle joint. Both the subluxated ankle joint and the talus neck fracture were reduced. A few bone fragments from the fracture comminution were found and they were used as autologous bone grafts after fracture fixation. Reduced talar neck fracture was provisionally fixed with 2 guide wires which was followed by internally fixation by two 4-mm Cannulated-Cancellous screws under C-arm guidance. The medial malleolus fracture was reduced and internally fixed with two 4-mm Cannulated-Cancellous screws. Ankle & subtalar movements were examined and found to be normal. Regrettably, during the medial malleolus screw fixation, a guide wire broke, rendering it unretrievable despite multiple attempts (Fig. 3). The wound closed without tension with a drain in situ, a sterile dressing, and below-knee splinting done (Fig. 4).



Figure 2: Anteroposterior and lateral X-rays of the left ankle showing talar neck fracture with the ankle joint partially subluxated and a broken medial malleolus.

Outcome and follow-up

We administered broad-spectrum IV antibiotics for five days. The wound was healthy and free of discharge post-operatively. Due to comminution and associated open medial malleolus fracture, we recommended functional rehabilitation after the 6th post-operative week and non-weight bearing for 3 months.

The patient, however, stopped following up after a month and began intermittent partial weight bearing before reporting to us in the tenth post-operative week with little discomfort while walking, a dorsiflexion range of 0–15°, and a plantarflexion range of 0–30°. On examination, patient had a American



Figure 3: Intraoperative post-reduction C-arm picture (left). Post-open reduction and internal fixation anteroposterior C-arm view (Middle) and lateral C-arm view (Right).

Orthopaedic Foot and Ankle Society score (AOFAS) score of 86, which indicates a good outcomes. A subchondral radiolucency was noted in the central and medial aspects of the talar dome (Fig. 5).

Discussion

The combination of talus neck fracture and ankle subluxation, along with ipsilateral medial malleolar fracture, is exceptionally rare. Very few cases have been reported until now [4,5]. Numerous reports have been made of complications, such as osteonecrosis, collapse, malunion, post-traumatic arthritis, and discomfort [3]. The time of definitive fixation depends on multiple factors, including fracture comminution and subtalar dislocation/subluxation [6,7].

Talus fractures that happen with a malleolar fracture have a lower chance of avascular necrosis (AVN) because the ligament-capsule complex between the broken piece and malleolus is still intact, which helps keep the blood supply and soft tissue healthy.

In our case, we operated on an emergency basis within 10 h of injury due to associated fracture comminution, open soft tissue injury, and unreduced ankle subluxation to minimize the risk of future avascular necrosis. A retained broken guide wire during medial malleolus fixation was decided not to remove given its harmless intramedullary position and to prevent the further soft tissue damage that will incur during the extraction process that will increase the overall operative time and chances of infection.

Although asymptomatic, this intraoperative event underscores the need for caution during hardware placement and raises potential concerns for future procedures. Post-operative x-rays revealed a partial Hawkins sign in the central and medial region of the talar dome, which is reliable evidence of talus vascularity after fracture and suggests that the chances of AVN are unlikely [8,9]. Our case was managed without CT or MRI, which the patient declined given the patient's poor socio-economic status. While this limited detailed fracture assessment, it emphasizes the role of clinical judgment and standard radiographs in urgent surgical decision-making when advanced imaging is unavailable.

The present standard for treating talus neck fractures is to use the anteromedial and anterolateral dual incision techniques [6]. In our case, we used the open medial wound proximally and extended the incision anteromedially and distally. Open fractures, which are frequently accompanied by soft tissue contamination and stripping, were discovered to have a 25% deep infection risk in open talus injuries [10]. The emergency reduction of dislocation, limb elevation, appropriate antibiotic administration, and tension-free suturing of the wound can all help to reduce soft tissue and wound problems, such as skin necrosis, infections, and poor wound healing [6]. Our patient showed no signs of a superficial or deep surgical site infection after surgery. While the single anteromedial approach was effective in our case, further randomised comparative studies with standard dual-incision techniques will be required to study the relative benefits or limitations of this approach.



Figure 4: Post-surgery wound picture showing the single antero-medial approach.



Figure 5: 10th post-operative week ankle X-ray showing subchondral radiolucency was noted in the central and medial aspects of the talar dome.

Several studies [6] have found a correlation between poor functional results and increasing injury severity. Although our patient lost contact after a month and began intermittent partial weight-bearing, the patient had better functional results.

Talar neck malunion rates can range from 20% to 37%, while talar neck nonunion rates are uncommon (5% each) [7]. On the X-ray taken in the 10th week following surgery, there was no sign of talar neck malunion in our case. Despite instructions for strict non-weight bearing, the patient began early partial weight bearing. This sub-optimal compliance is explained by the poor socioeconomic status, cultural belief, long travel distance from their rural area to the hospital etc. This introduces a variable in outcome interpretation and underscores the importance of understanding the patient's socio-economic condition. Post-traumatic subtalar arthritis is a typical long-term complication in such cases [7]. Our case requires a long-term follow-up since post-traumatic arthritis progresses over time. Our patient discontinued follow-up after one month, returning only at the 10th week yet presented with good clinical and functional outcome given the complexity of the case presentation. This highlights the challenges of ensuring long-term monitoring in trauma cases, especially in socioeconomically constrained populations.

Conclusion

The case study demonstrates the intricacy and uncommonness of a talar neck fracture accompanied with an ipsilateral medial malleolar fracture and ankle dislocation. The positive early

results were a result of timely surgical intervention within 10 h, careful soft tissue treatment, and suitable fixation procedures. Following surgery, a partial Hawkins sign showed up, which was positive because it showed intact talar vascularity and a decreased likelihood of AVN. To get the best results possible for severe talar injuries, this case emphasizes the significance of prompt therapy, careful surgical planning, and attentive follow-up.

Clinical Message

- For complex fractures, early surgical intervention is necessary: In cases of talus neck fractures with accompanying open malleolar injuries and ankle subluxation, prompt surgical therapy within the golden window (preferably within 10–12 h) should be prioritized to reduce the risk of infection and avascular necrosis.
- Use of a single anteromedial method in certain situations: When possible, the single anteromedial approach can offer sufficient exposure for fixing fractures of the medial malleolus and talar neck, particularly when it extends from an open wound that already exists. Nonetheless, this strategy must be taken into account depending on the soft tissue state and fracture pattern.
- Strict follow-up and monitoring following surgery: Regular post-operative follow-up is crucial because to the elevated risk of complications, such as AVN, collapse, and arthritis. Results may be compromised by noncompliance or early weight bearing, as in this instance. Particularly in lower socioeconomic contexts, tactics, such as patient education and community health worker follow-ups may increase compliance.
- Antibiotic prophylaxis and wound management: Broad-spectrum antibiotics and tension-free closure methods are essential for avoiding deep infections and problems from wound healing in open talar injuries.
- Autologous bone graft utilization: Useful bone pieces are frequently produced by appropriate fracture comminution; if sterile and viable, these can be successfully utilized for grafting during internal fixation.

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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