

# A neglected Bosworth fracture-dislocation complicated by diabetic neuropathy: a case report

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## Abstract

The Bosworth fracture-dislocation is an exceedingly rare and complex ankle injury characterized by the entrapment of the proximal fibular fragment behind the posterior tibial tubercle. Due to its anatomical configuration, this injury is typically irreducible by closed means and poses a significant diagnostic challenge. We present a unique case of a neglected Bosworth fracture in a 62-year-old female who presented three months after the initial trauma. Upon her delayed presentation, clinical examination revealed a fixed external rotation and equinus deformity of the right ankle, while radiographic and computed tomography (CT) evaluations confirmed a chronic Bosworth fracture-dislocation. A key feature of this case was the patient's newly diagnosed uncontrolled diabetes mellitus and associated severe peripheral neuropathy. It is highly probable that the loss of protective sensation masked the typical pain response, allowing the patient to intermittently bear weight and leading to a neglected clinical picture consistent with early Charcot neuroarthropathy. Given the chronic nature of the dislocation and the significant joint destruction, anatomical open reduction and internal fixation were no longer feasible. Instead, a salvage procedure consisting of fibular repositioning and ankle arthrodesis with an intramedullary nail was performed to provide skeletal stability and prevent further complications such as ulceration or limb loss. This case highlights how comorbidities like diabetic neuropathy can alter injury perception, leading to delayed treatment and the necessity for more radical surgical interventions like arthrodesis.

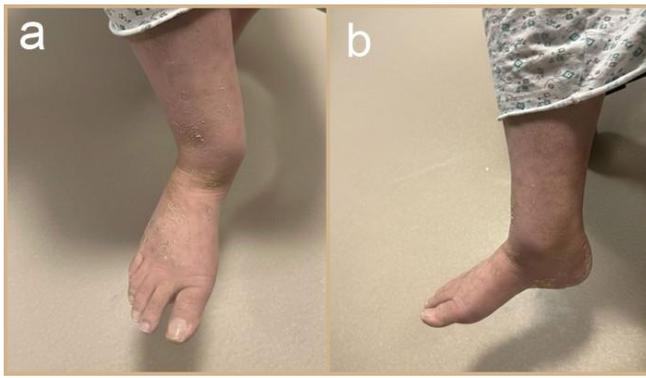
**Keywords:** Bosworth fracture, ankle dislocation, diabetic neuropathy, Charcot neuroarthropathy, neglected fracture, ankle arthrodesis.

## Introduction

The Bosworth fracture-dislocation is a rare and often irreducible ankle injury characterized by the entrapment of the distal fibula behind the posterior tibial tubercle [1,2]. It is most commonly associated with a Weber type B fibular fracture, although a posterior malleolus fracture may also be present [1]. This injury typically results from a supination-external rotation mechanism [3]. Diagnosis is frequently delayed, increasing the risk of inappropriate management and subsequent complications [1,2].

## Case report

A 62-year-old female presented to the emergency department with deformity and intermittent pain in her right ankle. History revealed that the patient had initially presented to the emergency department three months prior following a ground-level fall; however, she had refused treatment and left the hospital against medical advice. The patient had no known comorbidities or history of medication use, however, her medical history included right-sided congenital hip dysplasia. On physical examination, the ankle was fixed in external rotation and equinus (Figure 1), with limited active and passive range of motion. Radiographic



**Figure 1.** (a, b) Deformity of the right ankle demonstrating external rotation and equinus positioning.



**Figure 2.** (a, b) Preoperative anteroposterior and lateral radiographs demonstrating Bosworth fracture-dislocation of the right ankle, with posterior entrapment of the proximal fibular fragment behind the distal tibia. The fibula fracture corresponds to Weber type B.

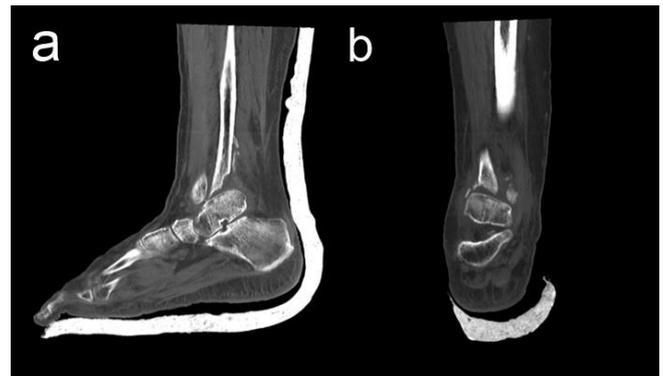
evaluation revealed a fracture-dislocation of the ankle (Figure 2). Distal neurovascular status was intact. Notably, the patient reported intermittent weight-bearing since the initial trauma.

Following plain radiographs, a computed tomography (CT) scan was obtained to confirm the diagnosis and plan surgical intervention (Figure 3). Laboratory analysis revealed a fasting blood glucose level of 401 mg/dL and an HbA1c of 11.3%. Following consultations with relevant specialists, the patient was diagnosed with newly diagnosed diabetes mellitus. It was hypothesized that severe, undiagnosed diabetic neuropathy may have masked the pain associated with the fracture, leading to the delayed presentation. The clinical presentation was also consistent with Charcot neuroarthropathy.

Given the chronic nature of the injury and the clinical findings, ankle arthrodesis was planned. Intraoperatively, the proximal fragment of the lateral malleolus, which blocked reduction, was disengaged to achieve joint alignment. Subsequently, an intramedullary arthrodesis nail was inserted to stabilize the ankle (Figure 4).

## Discussion

Bosworth ankle fractures are rare and complex injuries characterized by the posterior entrapment of the proximal



**Figure 3.** (a) Sagittal computed tomography (CT) image demonstrating the distal fibula positioned posterior to the posterior tibial cortex in a malreduced and locked configuration. (b) Coronal CT image showing posterior displacement of the distal fibula, which is locked behind the posterior tibial tubercle, with clear disruption of the distal tibiofibular alignment.



**Figure 4.** (a, b) Postoperative anteroposterior and lateral radiographs showing ankle arthrodesis with intramedullary fixation and restoration of joint alignment.

fibular fragment behind the distal tibia, often resulting in an irreducible fracture-dislocation pattern [1,2]. Due to their uncommon radiographic appearance and the overlapping of bone structures, diagnosis is frequently delayed, which may lead to inappropriate initial management and increased complication rates [1,2]. Systematic reviews and recent concept analyses have demonstrated that closed reduction attempts are unsuccessful in the majority of cases; therefore, early open reduction is generally required to achieve anatomical alignment and prevent soft tissue complications [1,2].

Delayed presentation, as observed in the present case, further complicates management and may negatively affect clinical outcomes. Recent case reports and reviews emphasize the importance of advanced imaging modalities, particularly computed tomography (CT), for accurate diagnosis and surgical planning in suspected Bosworth fractures [2,3]. In neglected cases or in patients with comorbidities that impair pain perception and joint stability, alternative surgical strategies, such as ankle arthrodesis, may be considered to achieve definitive stability and pain control.

In the presented case, the management was significantly influenced by the patient's undiagnosed chronic

diabetes. The loss of protective sensation due to severe neuropathy likely masked the pain of the initial trauma, exacerbating the deformity and leading to the neglected presentation [4,5]. This clinical picture is consistent with Charcot neuroarthropathy, a serious complication of diabetes characterized by bone destruction and joint instability [4,5]. In Charcot patients, the loss of sensation prevents the patient from perceiving micro- or macro-trauma, allowing continued weight-bearing that worsens the injury [4,5]. Consequently, due to the chronic nature of the fracture and the Charcot-like destruction, open reduction was not feasible, and ankle arthrodesis became the necessary treatment aimed at limb salvage and preventing further complications such as ulceration or amputation.

### Author contributions

The author confirms sole responsibility for the following: study conception and design, material preparation, data collection, analysis, and manuscript preparation.

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#### Conflict of Interest

The authors declare that they have no conflict of interest.

### Ethical statement

The author confirms that this retrospective study was conducted in accordance with the ethical standards outlined in the 1964 Declaration of Helsinki and its later amendments. Informed consent was obtained from patient.

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