

# Open bilateral tibial shaft fracture: Case Report

Marta Santos Silva<sup>1</sup>, Tiago Barbosa<sup>1</sup>, Ana Ribau<sup>1</sup>, José Muras<sup>1</sup>

## Abstract

**Introduction:** Leg shaft fractures are common, usually requiring a complex treatment, specially when they are open fractures.

**Case presentation:** This case report describes the presentation, surgical approach and complications of a 32-year-old man, who suffered a motorcycle accident, resulting in an open bilateral tibial shaft fracture (type IIIA + type IIIB Gustillo-Anderson classification) and right calcaneal Sanders type IV fracture.

**Conclusion:** The clinical case illustrates the challenging treatment options, with an excellent clinical and radiological outcome.

**Keywords:** Tibial Shaft Fracture, Osteosynthesi, Arthrodesis, Pseudoarthrosis

### Introduction

Leg shaft fractures are the most common fractures of long bones and reach mainly young men<sup>1</sup>, as cause of traffic accidents and falls from height. Due to the high energy involved and scarce skin cover, these fractures frequently result in open fractures. The goal of this study was to present the complex clinical case of a patient with a bilateral open fracture of the leg shaft bones, as well the therapeutic options, complications and follow-up.

### Case presentation

The authors present the clinical case of a 32-year-old man, previously healthy, who suffered a motorcycle accident, resulting in an open, comminuted, bilateral tibial pylon fracture, grade IIIA on the left and grade IIIB on the right, according to the Classification de Gustillo-Anderson and type III according to Rueli-Allgower. The patient also had a comminuted fracture of the right calcaneus, type IV in the Sanders Classification (figure 1). Prophylactic antibiotic therapy was promptly initiated in the emergency department. On physical examination, the patient presented palpable pulses and no neurologic deficits. In operating room, osteotomy was performed with bilateral external fixation. At 2 weeks, after favorable clinical and radiological evolution, osteosynthesis with a plaque on the left lower limb was performed (figure 2). After 4 months, with soft tissue optimization, external fixation extraction and calcaneotibial arthrodesis were performed on the right lower limb (Figure 3). The left lower limb complicated with infection, having undergone antibiotic therapy and multiple surgical debridements. After 9 months, pseudoarthrosis with material failure was observed, and patient underwent material extraction and immobilization with a cast boot (figure 4). After 2 years of follow-up, consolidation of the fractures was confirmed

(Figure 5). The patient was clinically stable with no evidence of infection, with slight mechanical pain (two points on the Visual Analogue Scale) and autonomous gait (figure 6). On the AOFAS (American Orthopedic Foot and Ankle Score) it scored a total of 65 points.

### Discussion

Although open leg shaft fractures are common, treatment remains controversial and challenging [2,3] with no negligible early and late complications<sup>3</sup>. Infections occur in 5 to 15% of the cases, which can lead to other complications, such as delayed consolidation, pseudoarthrosis or chronic osteomyelitis [3,4]. Pseudoarthrosis may occur in up to 5% of cases and is usually associated with open and comminuted fractures. The gold standard treatment is bone graft placement and osteosynthesis with plaque [5,6,7]. In the present case, the authors chose material extraction, as a salvage solution, because the patient had undergone multiple previous interventions for infection treatment and the skin conditions were not optimal. Bone consolidation occurred with cast immobilization, a decision that is debatable but valid and proved to be effective. As described in other cases, amputation would be a tragic and final option. Other complications are joint stiffness, mal union and post-traumatic arthrosis [2,3,6]. According to the literature, the initial treatment for grade III A-C open fractures is osteotomy with external fixation, as they are presumably infected with soft tissue damage. When clinical situation is favorable, definitive osteosynthesis should be performed [3,4,7].

### Conclusion

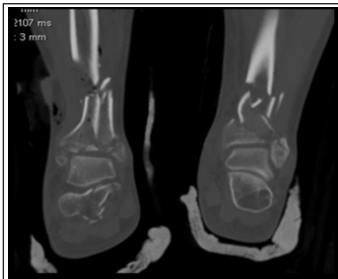
In conclusion, the complex clinical case presented illustrates

<sup>1</sup>Centro Hospitalar do Porto – Hospital Santo António, MD, Largo do Prof. Abel Salazar, 4099-001 Porto

#### Address of Correspondence

Dr. Marta Santos Silva,  
Centro Hospitalar do Porto – Hospital Santo António, MD,  
Largo do Prof. Abel Salazar, 4099-001 Porto.  
Email: marta\_sss\_@hotmail.com

challenging and controversial treatment options that have resulted in a favorable clinical and radiological outcome.



**Figure 1:** Computed tomography scan, performed in emergency department (left and right lower limbs)



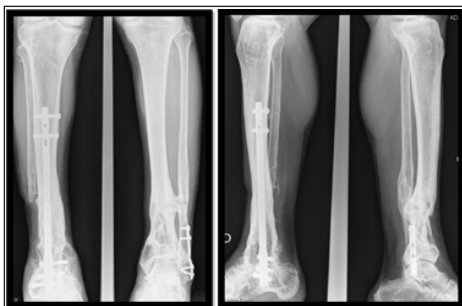
**Figure 2:** X Ray, osteosynthesis of the left lower limb



**Figure 3:** X Ray, calcaneotibial arthrodesis of the right lower limb



**Figure 4:** X Ray, pseudoarthrosis with material failure of the left lower limb



**Figure 5:** X Ray of the left and right lower limbs – consolidated fractures



**Figure 6:** Final clinical outcome

## References

1. Hungria J, Mercadante M. Fratura exposta da diáfise da tíbia – tratamento com osteossíntese intramedular após estabilização provisória com fixador externo não transfixante. *Ver Bras Ortop.* 2013;48(6):482–490.
2. McMahon SE, Little ZE, Smith TO, Trompeter A, Hing CB. The management of segmental tibial shaft fractures: A systematic review. *Injury.* 2016 Mar;47(3):568-73.
3. Papakostidis C, Kanakaris NK, Pretel J, Faour O, Morell DJ, Giannoudis PV. Prevalence of complications of open tibial shaft fractures stratified as per the Gustilo-Anderson classification. *Injury.* 2011 Dec;42(12):1408-15.
4. Melvin JS, Dombroski DG, Torbert JT, Kovach SJ, Esterhai JL, Mehta S. Open tibial shaft fractures: I. Evaluation and initial wound management. *J Am Acad Orthop Surg.* 2010 Jan;18(1):10-9. complicações
5. Hutchinson AJ, Frampton AE, Bhattacharya R. Operative fixation for complex tibial fractures. *Ann R Coll Surg Engl.* 2012 Jan;94(1):34-8.
6. Märdian S, Giesecke M, Haschke F, Tsitsilonis S, Wildemann B, Schwabe P. Treatment of Tibial Non-Unions - State of the Art and Future Implications. *Acta Chir Orthop Traumatol Cech.* 2016;83(6):367-374.
7. Melvin JS, Dombroski DG, Torbert JT, Kovach SJ, Esterhai JL, Mehta S. Open tibial shaft fractures: II. Definitive management and limb salvage. *J Am Acad Orthop Surg.* 2010 Feb;18(2):108-17.

Conflict of Interest: NIL  
Source of Support: NIL

## How to Cite this Article

Silva M S, Barbosa T, Ribau A, Muras J. Open bilateral tibial shaft fracture: Case Report. *Trauma International* Sep - Dec 2018;4(3):26-27.