



## Original Article

# Epidemiological study on calcaneus fractures in a tertiary hospital<sup>☆</sup>

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### ABSTRACT

**Objective:** To analyze the epidemiology and characteristics of patients with calcaneus fractures.

**Methods:** This is a retrospective revision of patients with calcaneus fractures hospitalized in the Institute of Orthopedics and Traumatology of this institution between 2006 and 2010. Data such as age, gender, laterality, trauma mechanism, type of fracture, associated injuries, compound fractures, and time from injury to surgery were analyzed.

**Results:** The analysis of 52 patients showed that men were more commonly affected than women, at a ratio of 5.5:1. Bilateral fractures were observed in ten cases, resulting in a total of 62 calcaneus fractures. A fall from a height was the most frequent trauma mechanism (75%), followed by motorcycle accidents (11.5%) and automobile accidents (9.6%). The most frequent fractures were intra-articular, with 47 cases. Compound fractures were observed in 15 patients (28.9%). Non-surgical management was adopted for 11 patients while 41 patients underwent surgery. The mean time between trauma and the definitive treatment was 7.8 days (range: 0–21 days), and 58.5% of cases were treated within seven days.

**Conclusion:** Patients with calcaneus fractures, most commonly young men, were admitted to a high complexity care hospital, victims of a fall from a height with associated injuries. The great severity of these fractures is characterized by the high prevalence of bilateral (19.2%) and compound fractures (28.9%) in this population group.

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## Estudo epidemiológico das fraturas do calcâneo em um hospital terciário

### R E S U M O

**Palavras-chave:**  
Fraturas ósseas  
Calcâneo  
Epidemiologia

**Objetivo:** Analisar a epidemiologia e as características das lesões e dos pacientes com fraturas do calcâneo.

**Métodos:** Revisão retrospectiva dos pacientes com fraturas do calcâneo internados de 2006 a 2010, no Instituto de Ortopedia e Traumatologia dessa instituição. Foram analisados parâmetros como idade, gênero, lateralidade, mecanismo de trauma, tipo de fratura, lesões associadas, exposição e tempo decorrido até o tratamento cirúrgico.

**Resultados:** Foram encontrados 52 pacientes com fratura do calcâneo, dez casos bilaterais (19,2%), total de 62 calcâneos fraturados, com predomínio do gênero masculino, na relação 5,5:1. A média de idade foi de 36,8 anos. O mecanismo de trauma mais frequente foi a queda de altura (75,0% dos casos), seguido por acidentes de motocicleta (11,5%) e acidentes de automóvel (9,6%). Fraturas intra-articulares foram mais frequentes, com 47 casos. Quinze pacientes apresentaram fraturas expostas (28,9%). Dos 52 pacientes com fratura do calcâneo, 11 foram tratados conservadoramente e 41, cirurgicamente. O tempo médio entre o trauma e o tratamento cirúrgico definitivo foi de 7,8 dias, variou de 0 a 21 dias, com a maioria dentro dos primeiros sete dias (58,5%).

**Conclusão:** Pacientes com fraturas do calcâneo atendidos em um hospital voltado para o atendimento de alta complexidade foram na maioria jovens, do sexo masculino, que sofreram queda de altura e com algum tipo de lesão associada. Os índices elevados de bilateralidade (19,2%) e de exposição da fratura (28,9%) caracterizam a maior gravidade dessas fraturas nesse grupo populacional.

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## Introduction

Calcaneal fractures are uncommon, accounting for approximately 2% of the total number of fractures.<sup>1-3</sup> However, they are the most common fractures of the tarsus (60%).<sup>1</sup> They are frequently associated with high-energy axial trauma, mainly due to falls from a height and automobile accidents.<sup>1,2,4,5</sup> The high energy of the trauma is correlated with soft tissue involvement, and combined lesions are found in 50% of cases<sup>6</sup>; other fractures of the lower limbs and lumbar spine fractures (10%) are the most frequent associations.<sup>7,8</sup>

Intra-articular fractures account for 70% of the cases; these are the most challenging and present the worst outcomes.<sup>1</sup> Studies conducted in the United States indicate that these fractures usually affect young adults between 21 and 45 years old (90% of cases).<sup>5,7,9</sup>

The diagnosis is confirmed by lateral and anteroposterior view foot radiographs and Harris view (axial) calcaneal radiographs.<sup>4</sup> In cases of intra-articular fractures, computed tomography is indicated for a better understanding of the injury.<sup>4,9</sup>

Treatment is based on the characteristics of the fracture and associated injuries, as well as on the local soft tissue conditions.<sup>7,10</sup> Re-establishment of the normal anatomy is correlated with the good functional outcome.<sup>10,11</sup> Conservative treatment is usually indicated for extra-articular injuries or in those with small intra-articular involvement, with little or no deviation. The presence of severe joint involvement,

significant deviation, and compound lesions are indications for surgery.<sup>10</sup>

A search in the SciELO and LILACS databases and in the journals *Acta Ortopédica* and *Revista Brasileira de Ortopedia*, using the terms “fracture” and “calcaneus,” as well as a search on PubMed using the terms “calcaneus,” “fractures,” and “Brazil” failed to retrieve studies in Portuguese on the epidemiology of calcaneal fractures.

This study is aimed at evaluating the epidemiology of calcaneal fractures in hospitalized patients treated from 2006 to 2010 in a tertiary orthopedic and traumatology hospital, considering that the knowledge of characteristics, patterns, and frequency of the fractures is useful for adequate treatment and prevention.

## Patients and methods

A retrospective review was carried out by collecting data from the medical records and imaging studies of patients with calcaneal fractures attended to at a tertiary orthopedic and traumatology hospital from 2006 to 2010. The study assessed parameters such as age, gender, laterality, trauma mechanism, type of fracture, associated injuries, the presence of compound fractures, and time elapsed until surgical treatment. The study included all patients admitted to this hospital with a diagnosis of calcaneus fracture. Patients whose data were incomplete (identification, diagnosis, and post-treatment radiographic images, or irregularities in the

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