



Original Article

Surgical treatment of intraarticular fractures of the calcaneus: comparison between flat plate and calcaneal plate[☆]

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ABSTRACT

Objective: To evaluate the clinical results of surgical treatment of intraarticular fractures of the calcaneus, comparing the use of calcaneal plate and flat plate.

Methods: This was a retrospective study assessing the postoperative results of 25 patients between 2013 and 2015. Patients undergoing surgical treatment of intraarticular fractures of the calcaneus without concomitant surgical lesions were included. Patients who did not complete appropriate follow-up after surgery were excluded from the study.

Results: The unavailability of calcaneal plates at resource-limited settings, associated with the availability and lower cost of flat plates, may have been a confounding factor in the present study. However, there was no statistical difference between the outcomes of fractures treated with calcaneal plates or flat plates.

Conclusion: Statistical inference shows that, when calcaneal plates are not available, it is possible to use flat plates with similar clinical outcomes.

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Tratamento cirúrgico das fraturas intra-articulares do calcâneo: comparação dos resultados entre placa reta e placa própria para calcâneo

RESUMO

Objetivo: Avaliar os resultados clínicos do tratamento cirúrgico das fraturas intra-articulares do calcâneo (TCFIAC) e comparar o uso de placa própria para calcâneo (PPC) e placa reta (PR).

Métodos: Estudo retrospectivo que avaliou o resultado pós-operatório de 25 pacientes entre 2013 e 2015. Foram incluídos pacientes submetidos ao TCFIAC e que não apresentavam lesões cirúrgicas concomitantes. Pacientes que não foram devidamente acompanhados no pós-operatório foram excluídos da análise.

Palavras-chave:

Calcâneo/lesões

Calcâneo/cirurgia

Fraturas ósseas/cirurgia

Fixação interna de fraturas

[☆] Study conducted at the Universidade Luterana do Brasil (Ulbra), Hospital Universitário, Departamento de Ortopedia e Traumatologia, Canoas, RS, Brazil.

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Resultados: A indisponibilidade da PPC em serviços com recursos limitados, associada à disponibilidade e ao menor custo da PR, pode ter sido fator de confusão no presente estudo. Contudo, não houve diferença estatística entre os resultados das fraturas tratadas com PPC ou PR.

Conclusão: A inferência estatística permite concluir que, na ausência da PPC, é possível usar a PR com desfechos clínicos semelhantes.

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Introduction

Calcaneal fractures correspond to 2% of skeletal fractures and about 60% of fractures of the tarsal bones.^{1,2} Despite the great development of orthopedic traumatology in the last century, treatment of these fractures is still controversial and results are often unsatisfactory, due to the complex anatomical shape of the calcaneus, its cancellous structure, and the fact that it is subjected to constant weight load.³⁻⁶ Thus, this injury causes major socioeconomic and functional impairment to patients, and represents a burden to public and private compensation policies.¹

In recent decades, with the improvement of imaging studies, a better understanding of the mechanisms of trauma, and observance of the principles of anatomical reduction and absolute stability for joint fractures, it is now possible to improve clinical outcome for this type of fracture. For this purpose, several types of implants are available, including calcaneal plates (CP) and flat plates (FP).⁷

Therefore, this study aimed to evaluate the clinical outcomes of surgical treatment of intra-articular fractures of the calcaneus (STIAFC) and compare the use of CP and FP.

Material and methods

This was a retrospective cohort study, which evaluated late postoperative results of 25 patients operated between January 2013 and January 2015. This study was approved by the Research Ethics Committee under No. 117817/2014/CAAE 40266114.9.0000.5328.

Inclusion criteria comprised patients who underwent surgical treatment by open reduction and internal fixation (ORIF) of a unilateral calcaneal intra-articular closed fracture without other associated fractures, who had preoperative computed tomography and radiographs of the foot, ankle, and calcaneus, and who had signed an informed consent form.

Exclusion criteria were patients who were operated using the Essex-Lopresti technique or those in whom a minimally invasive surgery was performed; fractures treated conservatively due to patient's own reasons or lack of surgical indication; associated fractures; lack of adequate skin condition, edema, and blisters in the lateral aspect of the foot, not resolved by the date of the surgery; absence of clinical conditions due to vascular disorders, heart disease, or decompensated diabetes; severe traumatic brain injury; psychosocial problem; heavy smoking; refusal to undergo surgical

treatment; bilateral fractures; and refusal to sign the informed consent form.

During this period, 64 feet of 52 patients were operated by the same surgeon. All patients were called for reevaluation; 25 patients undergoing STIAFC met the inclusion criteria and were included in the study.

All patients were evaluated by the same surgeon who performed all surgeries. The following assessment scales were used: American Orthopaedic Foot and Ankle Society (AOFAS), the Global Social Functioning Scale (GSFS), visual analog (VAS), and the Medical Outcomes Study 36 (SF-36).⁸

Clinically, the following aspects were analyzed: subtalar joint in the standing and supine positions; varus and valgus deviation of the hindfoot; abduction; adduction; pronation and supination of the forefoot; range of motion for ankle flexion and extension; appearance of surgical scars; and need for crutches. For the classification of fractures, the Sanders⁹ and Essex-Lopresti¹⁰ classifications were used.

Similarly, all patients underwent late postoperative analysis with radiographic study in Bröden's view; calcaneus radiographs in profile and axial; bilateral radiographic evaluation of the feet with monopodal support; radiographic evaluation of the ankle in profile, anteroposterior, and in 15° of internal rotation; and bilateral computed tomography with 5-mm thick axial, coronal, and sagittal cuts.

The sample was divided into two groups according to the type of ORIF made. Group I consisted of patients treated with 3.5-mm one-third tubular FP. Group II included patients undergoing treatment with CP.

The criterion for the choice of material was random and based on the possibility of using CP, which was not always available. As fixation criteria, isolated FP or two combined FP were used when CP was not available. CP was used whenever available.

All patients were operated with the classic L-shaped lateral access route, starting 3 cm from the posterior region of the lateral malleolus, passing 3 cm below that, extending to the calcaneocuboid joint. Due to the high risk of skin necrosis, dissection was made at the subperiosteal level. The flap was folded down and maintained cranially with three 2.0 mm Kirschner wires attached to the talus, with visualization of the sheath of the peroneus muscles, which was preferably preserved. Under direct visualization of the fracture, reduction was carried out, with temporary fixation using Kirschner wires performed after intraoperative radiographic confirmation of the reduction. Definite fixation was made with either CP or FP. After closure by planes, an elastic compression bandage was made with Portovac[®] drain for 48 h and casting for four

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