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Original Article

Supination-external rotation ankle fractures: analysis of clinical results after syndesmotic screw removal☆

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ABSTRACT

Objective: To evaluate the postoperative results of patients with supination-external rotation ankle fractures who underwent syndesmotic screw (SS) removal.
Methods: Retrospective cohort study assessing the late postoperative results of 35 patients operated from January 2013 to June 2015. Patients undergoing treatment of rupture of the distal tibiofibular syndesmosis with SS fixation and who did not have any concomitant surgical injuries in sites other than the ankle were included. Patients who did not complete appropriate follow-up after surgery were excluded from the study.
Results: There was no statistical significant difference in the evaluated outcomes among the patients who had their SS removed and those who remained with the SS.
Conclusion: SS removal did not significantly alter the clinical results of patients surgically treated with SS for supination-external rotation fractures.

Fraturas do tipo supinação-rotação externa: análise dos resultados clínicos da retirada do parafuso transindesmoidal

Palavras-chave:
Fraturas do tornozelo
Fixação interna de fraturas
Traumatismos do tornozelo
Cirurgia ortopédica

RESUMO

Objetivo: Avaliar o resultado pós-operatório dos pacientes com fratura do tornozelo pelo mecanismo de supinação-rotação externa que foram submetidos a retirada do parafuso transindesmoidal (PT).
Métodos: Estudo de coorte retrospectivo que avaliou os resultados pós-operatórios tardios de 35 pacientes operados entre janeiro de 2013 e junho de 2015. Foram incluídos pacientes submetidos ao tratamento da ruptura da sindesmose tibiofibular distal com fixação com

☆ Study conducted at the Hospital Universitário de Canoas, Serviço de Ortopedia e Traumatologia, Grupo de Pé e Tornozelo, Canoas, RS, Brazil.

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PT e que não apresentavam lesões cirúrgicas concomitantes em outros sítios que não o tornozelo. Pacientes que não foram devidamente acompanhados no pós-operatório foram excluídos.

Resultados: Não houve diferença estatisticamente significativa nos desfechos avaliados entre os pacientes que tiveram o PT removido e os que permaneceram com o PT.

Conclusão: A retirada do PT não alterou significativamente o resultado clínico dos pacientes tratados cirurgicamente com PT por fraturas do tipo supinação-rotação externa.

Introduction

Ankle fractures can range from non-displaced and avulsion fractures to complex fractures, which require reduction and surgical fixation; this can be realized by different methods.[1]

Rotational lesions are the most frequent, and can be classified according to the Lauge-Hansen classification; the most common subgroup is fractures caused by the supination-external rotation mechanism (SER).[2] This type of fracture is subdivided into four stages: stage I, lesion of the anterior syndesmosis (anterior tibiofibular ligament) (SER1); stage II, oblique lateral malleolus fracture with fracture line direction from anteroinferior to posterosuperior (SER2); stage III, lesion of the posterior tibiofibular ligament or posterior malleolus fracture (SER3); and stage IV, medial malleolus fracture or deltoid ligament injury (SER4).[3]

When an ankle fracture occurs with syndesmotic diastasis (SD), several methods can be used for surgical repair, including syndesmosis fixation with syndesmotic screws (SS).[4–6] However, none of the fixation methods have shown to be superior to others. SS, despite being the most commonly used method, also presents failures from both the clinical and biomechanical standpoints. One of the drawbacks of this fixation method is that SS removal is often necessary, which can lead to additional complications.[7,8]

This study is aimed at evaluating the postoperative results of patients with ankle fractures by the SER mechanism that underwent syndesmotic screw removal (SSR).

Material and methods

This is a retrospective cohort study, which assessed the late postoperative results of 35 patients operated between January 2013 and June 2015. This study was approved by the Research Ethics Committee under registration No. 117817/2014/CAAE 40153914.4.0000.5328.

The inclusion criteria consisted of patients who underwent surgical treatment by open reduction and internal fixation of unilateral closed ankle fractures with SER-type trauma mechanism, without other associated fractures, who had undergone preoperative examinations without a cast with bilateral ankle radiography with anteroposterior, mortise and lateral views, and who signed the Informed Consent Form.

Exclusion criteria were as follows: patients submitted to conservative treatment of the fracture for reasons unique to the patient or because there was no surgical indication; associated fractures; lack of adequate skin condition, edema, and phlyctena in the lateral region of the foot, without resolution until the moment of surgery; ankle fractures by mechanisms other than the SER type; lack of clinical conditions due to vascular disorders, cardiopathies, or decompensated diabetes; severe traumatic brain injury; psychosocial issues; heavy smoking; refusal to undergo surgical treatment; bilateral fractures; fixation of the syndesmosis with two screws, removal of the one-third tubular plate or other fixation material or both in association with SSR; spontaneous breaking of the SS; and refusal to sign the Informed Consent Form.

During this period, 92 feet of 75 patients were submitted to the same surgical treatment for ankle fracture with syndesmotic lesion. All patients were called in for reassessment; 35 patients underwent surgical treatment with SS, met the inclusion criteria, and were included in the study.

All patients were assessed by the same surgeon who performed the surgery. The American Orthopedic Foot and Ankle Society (AOFAS), Global Social Functioning Scale (GSFS), visual analog (VAS), and Medical Outcomes Study 36 (SF-36) scales were used.[9]

Clinically, the following aspects were analyzed: range of motion (ROM) of the ankle in flexion and extension, return to normal activities, calf diameter, ankle width, physical therapy during postoperative recovery, and comorbidities. The Lauge-Hansen classification was used to categorize the fractures.[2]

Likewise, all patients underwent late postoperative analysis with bilateral ankle radiographs with monopodal support in lateral and anteroposterior views, and anteroposterior view with 15° of internal rotation.

The sample was divided into two groups, according to the need for SSR. Group I was composed of patients who remained with SS. Group II included patients who underwent SSR. Indication for SSR was based on the patient's complaints regarding irritation at the SS fixation site.

In the surgical procedure for the insertion of a SS, patients underwent spinal anesthesia, and were then positioned in a dorsal recumbent position, with a cushion under the sacroiliac region, ipsilateral to the fracture, and with the knee at approximately 30°–45° of flexion, held by a medical assistant. Preoperatively 2 g of intravenous cephalothin were administered. Thereafter, trichotomy and antisepsis were performed with alcoholic chlorhexidine, and sterile sheets were placed. The limb was subjected to venous drainage with an Esmarch bandage, followed by the application of a tourniquet on the proximal portion of the thigh. Surgery began with the fibula, through a posterolateral approach,[10] from the distal end of the lateral malleolus; it was extended proximally as necessary for