Tibial Fracture as a Complication of the Use of an Elastic Fixation Device in the Syndesmosis

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ABSTRACT
Elastic fixation in syndesmosis injuries is a widely performed procedure with good outcomes. We report a case of a tibial fracture as a complication of the elastic fixation of the syndesmosis, its treatment, and a literature review, in which we have not found reports of this complication.
Keywords: Ankle fracture; elastic syndesmotic fixation; tibial fracture.
Level of Evidence: IV

Fractura de tibia como complicación del uso de dispositivo de fijación elástica en la sindesmosis

RESUMEN
La fijación elástica en las lesiones de la sindesmosis es un procedimiento que se realiza ampliamente y brinda buenos resultados. Presentamos un caso de una fractura de tibia como complicación de la fijación elástica de la sindesmosis, su tratamiento y una revisión bibliográfica en la cual no hemos encontrado reportes sobre esta complicación.
Palabras clave: Fractura de tobillo; fijación sindesmal elástica; fractura de tibia.
Nivel de Evidencia: IV

INTRODUCTION

Ankle fractures are common injuries, with a reported incidence of 180 cases per 100,000 people per year.[1] In 23% of ankle fractures, an injury to the lower tibiofibular joint (syndesmosis) is detected,[2] which requires surgical stabilization to obtain good outcomes.[3] The elastic device technique for the fixation of the syndesmosis [4] has some advantages over rigid fixation with screws.[5] However, complications associated with the use of these devices, such as neurovascular injury,[6] foreign body reaction,[7] and osteolysis[8] have also been reported.

We present the case of a complication associated with elastic fixation of the syndesmosis, for which we have not found a description in the literature.

CLINICAL CASE

A 60-year-old male, obese (body mass index 35), with no relevant history. He had suffered a fall from his own height at home, which caused swelling and pain in his right ankle, so he went to the emergency department where AP and lateral ankle radiographs were ordered. The diagnosis was an ankle fracture-dislocation. He underwent a reduction, was fitted with a posterior plaster cast and remained hospitalized. 24 hours later, he underwent reduction and osteosynthesis with interfragmentary screws and a neutralization plate in the fibula, as well as syndesmosis fixation with Endobutton® outside the plate (Figure 1).

Received on July 3rd, 2023 Accepted after evaluation on November 3rd, 2023 • Dr. MARCELO RIO • marcelowrio@yahoo.com.ar https://orcid.org/0000-0001-7339-5558
How to cite this article: Rio M, Salonia P, Gabas D, Gotter G, Barrera Oro F, Sperone ED. Tibial Fracture as a Complication of the Use of an Elastic Fixation Device in the Syndesmosis. *Rev Asoc Argent Ortop Traumatol* 2024;89(2):158-163. https://doi.org/10.15417/issn.1852-7434.2024.89.2.1790

Figure 1. Post-surgical anteroposterior and lateral radiographs of the ankle after the first surgical procedure.

The patient evolved favorably and, after 48 h, he was discharged and monitored by the Outpatient Department. Two months after surgery, he was instructed to start progressive weight-bearing. A few days later, he began to experience sudden onset pain in the distal leg area, which did not improve with analgesics and rest, for which he consulted the emergency department after 48 hours.

After taking radiographs (Figure 2) and a three-dimensional reconstruction of the ankle (Figure 3), an OTA/AO42-A3.3 fracture of the distal tibia was diagnosed in the area where the Endobutton® suture passes, and the patient was immobilized with a posterior plaster cast.

In January 2023, he attended our institution where he received treatment for tibia fracture with an intramedullary malleolar entry nail (Figure 4). It was decided to use an intramedullary, malleolar entry nail because of the poor quality of the soft tissue in the anterointernal area of the leg and the high body mass index.[9] The postoperative evolution was favorable, with healing of the tibia fracture four months after the surgical procedure.

Figure 2. Anteroposterior and lateral radiographs of the distal tibia, two months after initial surgery. A fracture of the distal tibia is observed.

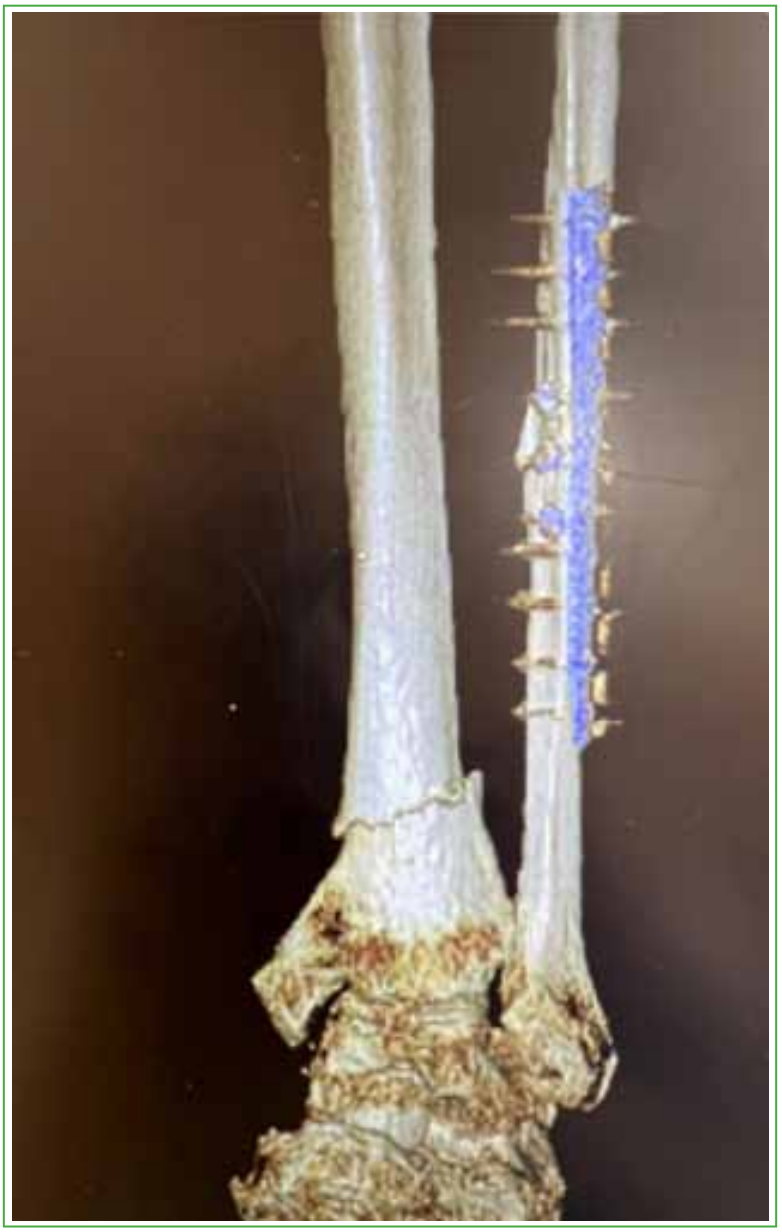

Figure 3. 3D reconstruction of the distal tibia. A distal tibia fracture is visualized.

Figure 4. Anteroposterior and lateral radiographs of the distal tibia, three months after surgery. Fracture healing is observed.

DISCUSSION

With the increased use of elastic fixation devices to treat ankle syndesmosis injuries, complications have also been reported. Storey et al.[8] observed three frequent complications: osteomyelitis around the high-strength suture, loss of the reduction obtained in the surgical procedure, and aseptic osteolysis around the suture. They specifically addressed the risk of fracturing part of the fibular cortices, hence they suggested inserting the device through the fibula osteosynthesis plate or using a washer. Kaiser et al.[10] reported fibula fractures when elastic devices were used, especially if they were not placed on a plate. They attributed this complication to the fact that the fibula is drilled with a drill bit ranging from 3.2 mm to 3.7 mm depending on the commercial brand of the implant, as opposed to the 2.5 mm drill bit used to place a screw. The second cause is the anatomical shape of the fibula in the 2-4 cm proximal to the syndesmosis where the fibula should be drilled, and the third cause is the incorrect orientation at the drilling start point in the fibula.

We have not found any literature reports on a fracture of the tibia as a complication of the use of this type of device. We believe the fracture in our patient was caused by the drill bit being very posteriorly oriented during perforating the fibula and tibia, resulting in an incomplete fracture of the tibia that was completed when the patient began weight bearing. To avoid this complication, we recommend visualizing the fibula correctly when drilling, angling the drill bit 30° from posterior to anterior, and using the image intensifier to evaluate the beginning of drilling in the tibia.

CONCLUSIONS

The use of elastic devices (Endobutton®) for the treatment of ankle fractures with lesions of the syndesmosis is very common and achieves good outcomes.

Despite multiple reports in the international literature, to date, we have not found a description of such a disabling complication as a distal tibial fracture due to the use of these implants. We suggest taking certain technical precautions when drilling the fibula and tibia to avoid iatrogenic bone injuries.

Conflict of interest: The authors declare no conflicts of interest.

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