



## CASE REPORT

# Distal tibia peri-implant fracture with an intramedullary nail: A case report<sup>☆</sup>

J.M. Reyes-Cabrera\*, R. González-Alconada, M.D. García-Mota

*Servicio de Cirugía Ortopédica y Traumatología, Hospital Virgen del Puerto, Plasencia, Cáceres, Spain*

Received 18 April 2013; accepted 6 May 2013

### KEYWORDS

Peri-implant fracture;  
Intra-medullary nail;  
Tibia

### PALABRAS CLAVE

Fractura  
peri-implante;  
Clavo intramedular;  
Tibia

**Abstract** Peri-implant fractures of the distal tibia after intramedullary nailing are rare. We present a case of a fracture of the distal tibia at the site of the distal interlocking screw. We found two cases reported in the world literature. There are no cases reported in the Spanish literature.

© 2013 SECOT. Published by Elsevier España, S.L. All rights reserved.

### Fractura peri-implante de tibia distal con clavo intramedular: presentación de un caso

**Resumen** Las fracturas peri-implante de tibia distal con clavo intramedular son poco frecuentes. Exponemos un caso de una fractura de tibia distal mediante los tornillos de bloqueo a este nivel. Hemos encontrado 2 casos obtenidos en la literatura mundial. En la literatura española no existe ningún caso estudiado.

© 2013 SECOT. Publicado por Elsevier España, S.L. Todos los derechos reservados.

## Introduction

Tibial diaphyseal fracture is one of the most common fractures in adults, and intramedullary nailing is the most commonly used option for its surgical treatment. Rupture of the osteosynthesis material before fracture consolidation has been widely reported, including breakage of the nail and locking screws. This can cause angulation,

shortening, consolidation delay and pseudoarthrosis (or nonunion) associated with migration of the nail. However, distal tibial fracture through the locking screws of the intramedullary nails is very rare, with only 2 cases reported in the literature.<sup>1</sup>

## Case report

The patient was a 62-year-old female with a history of distal fibular fracture treated by osteosynthesis using a plate and screws 4 years earlier, with no other relevant medical history. She attended the emergency room with left tibial diaphyseal fracture after suffering a fall from her own height (Fig. 1A). This was treated through intramedullary nail fixation with 2 proximal and 2 distal locks. No material from the

<sup>☆</sup> Please cite this article as: Reyes-Cabrera JM, González-Alconada R, García-Mota MD. Fractura peri-implante de tibia distal con clavo intramedular: presentación de un caso. Rev Esp Cir Ortop Traumatol. 2013;57:443–445.

\* Corresponding author.

E-mail address: [jomareca83@gmail.com](mailto:jomareca83@gmail.com) (J.M. Reyes-Cabrera).



**Figure 1** (A) Tibial diaphyseal fracture. The osteosynthesis material of the distal fibula with a consolidated fracture can be observed. (B) Six months postoperatively.

previous osteosynthesis was removed. At 6 months after the intervention, the patient presented a good clinical evolution and radiographic signs of fracture consolidation (Fig. 1B).

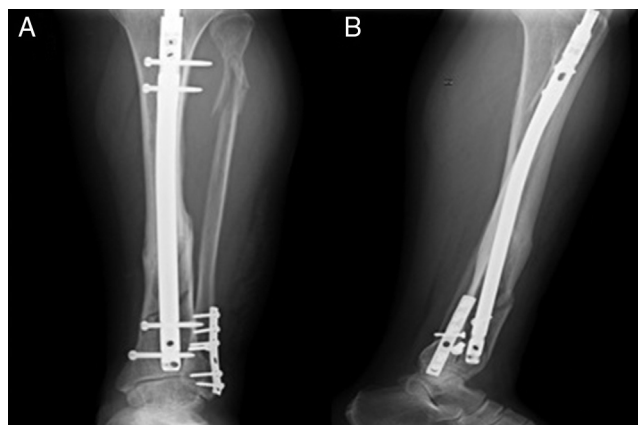
After 6 years of the fracture, the patient suffered a fall from her own height with subsequent pain, edema and loss of function of the left lower limb. The radiograph showed a distal tibial fracture which crossed the locking screws. In addition, the lateral projection revealed a locking screw on the outside of the nail, which had been placed in a wrong position from the outset (Fig. 2). We opted for an orthopedic treatment through a long leg cast for 6 weeks. Subsequent radiographic controls showed signs of consolidation.

## Result

The patient presented a favorable clinical and radiographic evolution.

## Discussion

Tibial diaphyseal fractures are some of the most common long bone fractures in adults and osteosynthesis with



**Figure 2** (A) Peri-implant fracture of the distal tibia (AP projection). (B) The distal locking screw can be seen outside the intramedullary nail.

intramedullary nails is generally used as a surgical treatment method.<sup>1,2</sup>

Peri-nail fractures have been reported in patients with proximal femoral fractures associated with short nails, with a higher incidence in uniaxial fixation than in biaxial.<sup>3</sup>

Peri-implant fractures have also been described in the forearm with osteosyntheses using plates in the pediatric population with an incidence of up to 7.3%. These may be due to falls, stress of the osteosynthesis material, iatrogenic causes, avascular necrosis, implant failure and pathological fractures.<sup>4</sup>

The literature contains 2 cases of peri-implant tibial fractures, of which the first was associated to a delay in consolidation of the tibial fracture with scarce support of the fibula due to the unfixed fracture and significant external rotation strength associated with the obesity of the patient. The second case was secondary to a moderate-high energy torque force caused by a fall off a skateboard in a young patient.<sup>1</sup>

In our case, out of the 2 distal locking screws, the most proximal, which was well placed in the nail locking orifice, may have acted as a fulcrum at the time of the fall and thus caused the peri-implant fracture after 6 years of consolidation. We decided to perform orthopedic treatment due to scarce displacement of the fracture, presenting a good clinical and radiographic outcome.

## Conclusions

Peri-implant tibial fractures are very rare complications which may be associated with moderate-high energy torsion forces, scarce structural support due to associated fibular fracture or to a fulcrum point which may cause a peri-implant fracture after a relatively low-energy trauma.

## Level of evidence

Level of evidence v.

## Ethical responsibilities

**Protection of people and animals.** The authors declare that this investigation did not require experiments on humans or animals.

**Confidentiality of data.** The authors declare that they have followed the protocols of their workplace on the publication of patient data and that all patients included in the study received sufficient information and gave their written informed consent to participate in the study.

**Right to privacy and informed consent.** The authors declare having obtained written informed consent from patients and/or subjects referred to in the work. This document is held by the corresponding author.

## References

1. Mounasamy V, Desai P. Peri-implant fracture of the distal tibia after intra-medullary nailing of a tibial fracture: a report of two cases. *Eur J Orthop Surg Traumatol.* 2012 [Epub ahead of print].
2. Duan X, Al-Qwbani M, Zeng Y, Zhang W, Xiang Z. Intramedullary nailing for tibial shaft fractures in adults. *Cochrane Database Syst Rev.* 2012;18. CD008241.
3. Norris R, Bhattacharje D, Parker MJ. Occurrence of secondary fracture around intramedullary nails used for trochanteric hip fractures: a systematic review of 13,568 patients. *Injury.* 2012;43:706–11.
4. Clement ND, Yousef F, Duckworth A.D., Teoh KH, Porter DE. Retention of forearm plates: risks and benefits in a pediatric population. *J Bone Joint Surg Br.* 2012;94:134–7.