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## Transplantal distal migration of a tibial kuntscher nail: About a case at Sylvanus Olympio hospital of Lome

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### Abstract

Open leg fractures are a therapeutic challenge because of the complexity of the initial management, the poor choice of immediate immobilization, and the difficult treatment of infectious and bone complications. The use of the kuntscher nail in open fractures ensures precarious stability of the fracture site, and exposing it to complications. We report the case of a trans-plantar distal migration of a kuntscher nail in a 43-year-old patient operated 11 years earlier for open leg fracture. Management consisted of nail removal, and treatment of infectious complications. Trans-plantar distal migration of the kuntscher nail is a rare but possible complication. It is favored by bone infection and contributes to the maintenance of the infection. The removal of the nail should be done as soon as possible and replaced with a more stable material if necessary.

**Keywords:** Migration, kunstcher nail, transplantary, tibia

### Introduction

The open fracture of the leg is very frequent <sup>[1]</sup> because of the superficial situation of the tibia. The fear of an open fracture is related to the risks of infection and sluggish evolution with the heaviness and the risk of the treatments implemented <sup>[2]</sup>.

Initial management aims to reduce the risk of infection by covering the fracture site after trimming and fixation with a stable fixation <sup>[3, 4]</sup>. Stabilization today uses methods including external fixation and locked intramedullary nailing. KÜNTSCHER's non-locked intramedullary nail nailing is still used in developing countries because of its affordability.

Distal migration of the unlocked nail is a rare complication and few cases are reported in the literature <sup>[5, 6]</sup>. We report the case of a patient with chronic tibial KÜNTSCHER nail osteitis who had been in place for 11 years with transplanar nail migration. We describe the clinical and radiological aspects and determine the factors that favored migration.

### Case Report

It was a 43 year old patient, teacher. He was received on 30<sup>th</sup> September 2016 in consultation at Sylvanus Olympio University Hospital Center (CHU-SO) of Lomé for ulceration of the right soles of the foot, which began a week before the consultation with externalization of the distal end of the nail.

In his antecedents the patient had presented in June 2005 an open fracture type III B of Gustilo <sup>[7,8]</sup> of the two bones of the right leg to the distal third following a road accident.

He had an emergency in trimming and suturing of the wound and stabilization of the fracture by an external tibio-tibial fixator.

The evolution was marked by cutaneous necrosis on the anterior aspect of the distal third of the leg with exposure of the tibia. This motivated the realization of a fascio-cutaneous flap sural hetero-tibial. The external fixator was also removed and a KÜNTSCHER nail of the tibia of 9 millimeter of diameter and 320 mm of length was inserted.

The postoperative course was marked by suppuration of the wound. The patient was lost from view after leaving the hospital.

Six months after the operation, the patient had an inflammatory swelling of the right leg and ankle, with fistula appearing on the anterolateral aspect of the right ankle that healed after local care. The patient would then have presented several similar episodes evolving by relapses followed by remission. The swelling of the right ankle would have progressively spread to the foot with stiffness of the right ankle.

In February 2016, he reportedly found an inflammatory punctiform ulceration on the right foot, healed in three weeks after local care. It was following the recurrence of the ulceration on the sole of the right foot one week before admission with appearance of the distal end of the nail that the patient consulted at the Sylvanus Olympio hospital for treatment.

The clinical examination at the entrance noted a patient in good general condition with lymphoedema of the distal third of the right leg, ankle and foot.

We noted two ulcerations: one in the distal third of the right leg, in the medial aspect, of oval shape with about 1 cm of major axis; the second at the level of the sole of the right foot, rounded 1 centimeter in diameter showing the distal tip of the nail. The ulcerations leaked a seropurulent fluid.

We noted also ankylosis of the right ankle with equinism of the foot.

The standard X-ray of the leg (Figure 1) taking the ankle and foot showed:

A distal migration of the nail into trans-plantar, a disappearance of the tibio-talar joint space, osteitis of the tibia with loss of bone substance, distal tibio-fibular synostosis and

nonunion of the fibula.

The patient under spinal anesthesia installed on an ordinary table, we proceeded to the removal of the nail by the plantar way through the plantar exit and carried out an abundant washing through the ulcerations. An X-ray was performed postoperatively (Figure 2)

Bacteriological examination of the specimen taken intraoperatively made it possible to isolate *Escherichia Coli* and the patient was put on antibiotic therapy. Immediate operative follow-up was simple with healing ulceration of the foot in two weeks but persistent ankle wound. The patient resumed walking the day after the intervention with support protected by a pair of canes



Fig 1: X-ray of the leg taking the ankle from the front and in profile

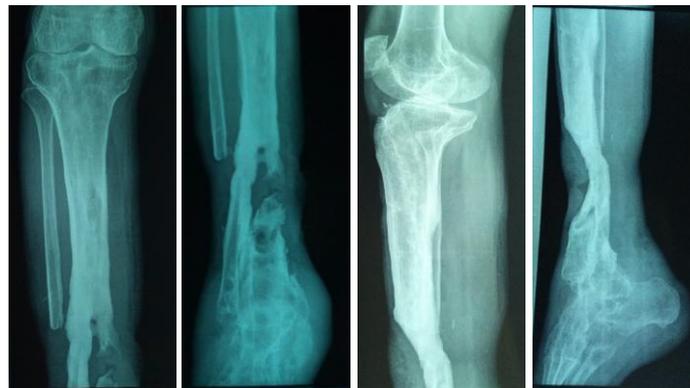


Fig 2: X-ray of the leg (face and profile) after removal of the Kuntscher nail

## Discussion

Chronic osteitis of long bones in adults is a very common bone infection in open fractures [9]. The infection of a superficial bone such as the tibia resonates on the adjacent tissues, thus creating an infiltration of the fixed soft parts around a possible fistula. In the presence of osteosynthesis equipment, difficult treatment involves the removal of this material, bone excision including adjacent soft parts, and cancellous bone grafting [10]. Stable stabilization of the fracture site ideally during initial trimming limits this risk of infection [3, 4, 11]. Locked intramedullary nailing is the material that provides better stability, preventing movements that could sustain the infection of the outbreak.

Its application, however, requires the existence of good material and technical conditions which, in most hospitals in low-income countries, are not always available and especially in an emergency.

Thus we often use the first exofixation relayed by intramedullary nailing as soon as the soft tissues allow it to

have a fast loading [4, 12].

KÜNTSCHER's non-locked intramedullary nail nailing is still used in our context because of its affordability, but exposes to complications such as rotational disorders, and nail migrations [6, 13-15]. These are often proximal to the femur and related to a small diameter nail [16-19]. Distal migration is rare. Very few cases are described in the literature [5, 6]. Ibrahimu *et al* [6] reported the case of an 11-year-old patient with distal migration of a femoral Küntscher nail into the knee joint three years after placement. Razafimahandry reported a case of KÜNTSCHER nail migration within 16 years of its implementation [5]. W'ifongo *et al* [22] reported the migration and curvature of a retrograde femoral nail. Moyikoua *et al* [23] attribute this accident to technical errors related to the use of nails of insufficient size. Our patient presented a distal migration of the tibial Küntscher nail following chronic osteitis of the right tibia on osteosynthesis equipment. For Gristina *et al* [20], Simpson *et al* [21], the infection causes bone lysis at the immediate periphery of the osteosynthesis

material. This results in a decrease in the anchoring quality of the nail. The bone infection in our patient was probably the source of a mobility space around the nail. Repetitive microtrauma then favored progressive aggression of distal bone structures by the nail. Ablation of the nail due to the importance of bone infection and it was done by pulling on the distal tip. Wifongo *et al* proceeded to a simple reintroduction of the ascended nail. The latter curved later under the weight of constraints. Moyikoua *et al* put back another nail after drilling. A nail that has been migrated must be replaced by more stable material when the consolidation is not yet acquired. In our patient the infectious context forced us to do just the ablation. The immediate operative follow-up was simple as in the case reported by Razafimahandry [5]. However, we have noted persistent ankle injury related to osteitis.

### Conclusion

Open leg fractures are common and usually severe. The initial management includes after cleaning, washing, surgical trimming and osteosynthesis ensuring a good stability of the focus.

Unlocked nailing has become an alternative but exposes itself to complications including distal nail migration. This is a very rare but regrettable complication favored by bone lysis around the material related to bone infection and repeated microtrauma. Regular follow-up of the patients must be done in order to proceed to the removal of the nail and its replacement if necessary by a more stable material.

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