

Transarticular Retrograde Technique for Küntscher Nail Removal from the Leg: A Case Report

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Abstract

Case Report

The removal of Küntscher intramedullary nails (IMN), whatever the site of their implantation, may pose specific problems. We report a 60-year-old man who presented with Küntscher tibial intramedullary nail migration through the ankle. We successfully extracted the intramedullary nail by transarticular retrograde technique, with good results at short and long term follow up.

Keywords: Intramedullar, nail, Küntscher, removal.

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INTRODUCTION

The removal of intramedullary nails, whatever the site of implantation, may be very difficult to remove, but many tips exist and should be known in order to face this problem. Indeed, nailing was done closed through small incisions; it would be challenging to remove them according to the same technique. Even more if we are in the presence of broken implants.

MATERIALS AND METHODS

We present a case of a 60 years old man operated 20 years ago in another hospital for medio-diaphyseal fracture of the right tibia by Küntscher intramedullary nail with steel wire strapping of a third diaphyseal fragment. Admitted in our institution for sepsis on osteosynthesis equipment with a cutaneous fistula in front of the steel wire which was probably the cause of infection by chronic irritation to the skin, on the X-ray we noted migration of the intramedullary nail downwards in the ankle realizing a kind of arthrodesis tibiotalar (Fig 1). Patient admitted to the operating room in supine position right leg hanged and the contralateral leg elevated, after reflection on the technique of

ablation of the nail, a good fistula trimming with superficial and deep bacteriological samples, and then we removed the steel wires and a bone sequestrum.

For nail removal, initial fluoroscopic planning of the entry point in the heel was made (Fig 2). Then a longitudinal skin incision of approximately 2 cm, followed by wicking and insertion of a 7-mm Hoffman bar into the cavity until it reached the tip of the Küntscher nail (Fig 3). By progressive hammering of the bar, the nail was extracted out through the proximal incision in the knee to the level of the anterior tibial tuberosity, and then the introduction of a hook passed through the proximal orifice of the nail and its complete removal (Fig 4).

RESULTS

Closing of the skin was possible without tension; a large spectrum antibiotic therapy was started for 6 months. At one-year follow-up there was complete wound fistula healing, the patient could walk unassisted without any limitation of knee or ankle motion.



Fig-1: X-ray showing migration of the intramedullary nail downwards in the ankle.



Fig-2: Fluoroscopic marking of the heel



Fig-3: Insertion of a Hoffman bar in the tibial canal until it reached the tip of the Küntscher nail and gentle hammering



Fig-4: Final extraction of the nail

DISCUSSION

Küntscher G, is considered the inventor of closed nailing of long bones especially tibial nail since November 1939. From the beginning of his experience he had considered difficulties of this hardware removing and describes the extracting technique in his publication [1].

Intramedullar nail removal after fracture consolidation is not always easy, it can be particularly challenging, especially removing of the old generation nails like Küntscher nails because there is not a specific extractor ancillary or for the new generations because of the growth bone around the nail, damage to the nail or screws [2, 3] fortunately many instruments and tips exist to help surgeons to face those difficulties such as conservatory techniques like extraction ancillary, hooks, guide wires and cerclage wire [4] or non-conservator techniques such as osteotomies or transarticular retrograde technique that is well described in our observation, the inconvenient of this method is the morbidities and complications to the ankle joint, in our patient we performed this technique because our patient had already ankle osteoarthritis [5,6]. Küntscher used a high-frequency for bone preparing to avoid fractures of the tibial shaft or tibial spines during the extraction [7,8].

For buried IMN, the technique of removal needs to introduce by the proximal incision, a hook in

the tibial nail hole. There is a different hook diameter; small ones may be needed for nails with a narrow diameter. [9] Therefore damaged or broken nails removal will be much more challenging and must remove two parts of the broken nail. However, we can leave the distal piece in situ if it is more distal to the nonunion site, and try to treat the site by cancellous bone grafting and internal osteosynthesis by plate or an external fixator such as Ilizarov ring fixator or Hoffman fixator [10].

CONCLUSION

Küntscher's nail is known for its very difficult removal. A good installation of the patient and bone preparation are essential to success any ablation, through the use of adequate instrumentation and mastery of ablation technical tips.

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