

Method for removing a jammed Kuntscher nail

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Abstract

A case of jamming of a Kuntscher nail is presented and a technique of its removal without the use of special instruments is described. Rotating the bent end of nail as a lever arm to its sideways loosens the nail. The method allows completion of the prescribed procedure without weakening of the structure of the femoral cortex and stability of the fixation.

INTRODUCTION

Although the method of internal fixation of femoral fracture with a Kuntscher nail has stood the test of time and is usually a safe and reliable procedure, the jamming of a nail during its insertion can be a frightening experience. The surgeon is left with a protruding nail that he is able neither to extract nor drive further into the femur. The selection of a too large a nail and inadequate reaming of the medullary canal are the most common causes of jamming.¹ The method the authors describe here allows the surgeon to easily remove the incarcerated nail with the instruments at hand and complete the prescribed operation.

METHOD

Incarceration or jamming of the nail is said to have occurred when the nail cannot be inserted further nor it can be extracted during the procedure. Further and prolonged hammering should be stopped. The usual extractor apparatus of Kuntscher nail should be first used to release the nail. If this fails after repeated attempts, the protruding end of nail is bent at right angle as close to bone as possible while holding firmly the proximal fragment with a bone holding forceps. The nail is then slowly rotated to left and right using the bent portion of nail as lever arm. The rotation of proximal fragment is prevented by holding it firmly with the bone holding forceps. After few attempts, it is possible to achieve to and fro movements of the nail. This to and fro movements of the nail to its sideways loosens it at the impacted site. The nail can then be extracted without difficulty. Further reaming of the canal and reinsertion of a suitable nail successfully concludes the operation.

CASE REPORT

A 20 year-old laborer was involved in a road traffic accident and was admitted to hospital with fracture mid-shaft of femur (Fig 1). Open reduction and internal fixation with Kuntscher nail was planned on same day. Patient was operated in lateral position. Fracture was exposed through a posterolateral incision and the proximal fragment was reamed with a 10 mm sized reamer once. Kuntscher nail of size 42x10 mm was driven into the proximal fragment in a retrograde manner.

Figure 1

Figure 1: Preoperative radiograph



Figure 2

Figure 2: Bent nail for extraction



But it became jammed at the junction of the middle and upper third of femur. It proved impossible to withdraw the Kuntscher nail with the available three extractors, which broke or loosened during the procedure. An entry portal at trochanteric end was made. Pushing of the nail from proximal to distal was tried but failed. The protruding end of the nail from the proximal fragment was bent slowly at about 90 degrees about 5 cm distal to the distal end of proximal fragment (Fig 2). The proximal fragment was firmly held with a bone holding forceps. The nail was then slowly rotated to the left and right using the bent portion of nail as lever arm. The rotation of proximal fragment was prevented with bone holding forceps. After 10-15 attempts, it was possible to rotate the nail to the left and right. These to and fro movements of the nail to its sideways loosened it at the impacted site. The damaged Kuntscher nail was then extracted without difficulty (Fig 3) and replaced by a 9-mm nail (Fig 4). Patient did not develop any postoperative complication.

Figure 3

Figure 3: Extracted Kuntscher nail



Figure 4

Figure 4: Postoperative radiograph



DISCUSSION

The jamming of the nail is an unpredictable and delicate situation, which needs careful technique for removal. The usual extractor hooks and hammers are useless when the nail is truly jammed.¹ In our case three extractors broke or loosened. Another method is to use a smaller diameter nail or solid rod to punch out the jammed nail from above.⁴ This is frequently unsuccessful and can lead to the nesting of one nail within the other or further fracture of the shaft with prolonged hammering.² The cutting of a longitudinal slot in

the femur and allowing the bone to expand is other described method to remove incarcerated nail. Then, the nail can be removed and replaced by a smaller one.^{1,3} However, following this maneuver the stability of the fracture may be lost and circumferential wiring is advised as a safety precaution. Nimberg and Rosenfeld described a technique whereby a window 5-7 cm long involving about one-fifth of the circumference of the femoral shaft was cut in the cortex at the site of the jam.² Through the window the nail was exposed and a chisel was used to enlarge the medullary canal, allowing the nail to be extracted. However, both these procedures involve further exposure of the femur proximally leading to more trauma to soft tissues and bone. Finally, if all else fails, a hacksaw can be used to remove the protruding part of the nail leaving a short stump 35 mm long, which may be manipulated into the medullary cavity of the distal fragment, and the patient treated on a Thomas's splint.¹ This is self-evident unsatisfactory state of affairs and the nail can never subsequently be removed without refracturing the femur.

The method described by us does not entail any further extension of the incision for removal of nail. This obviously avoided further trauma to soft tissue and bone. Also this procedure did not strip periosteum any further. No further comminution at fracture site took place. Fracture was rotationally stable after fixation. No circumferential wires were required to be placed around the femur. Also no

intraoperative radiographs or image intensifier was required.

The technique is simple and effective and can be used in peripheral hospitals where advanced gadgetries may not be present. One precaution is to firmly hold the proximal fragment while rotating the nail to its sideways. Otherwise proximal fragment may be denuded of soft tissues and advantage of the technique may be lost.

Young athletic individuals usually have rather small canals-as narrow as 6 or 7mm in diameter at the isthmus.¹ Adequate reaming of the medullary canal before insertion of the nail is an essential precaution with any size of canal or nail. An oversized nail should never be chosen. Inadequate reaming in an already smaller canal was probable reason for jamming in our case. Perhaps the most important precaution is for the surgeon to be certain that the nail advances steadily with each blow of the hammer and to stop at once if the nail shows no sign of progression.²

References

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