구형 유도핀 (Bulb-tipped Guide Wire)과 K 강선을 이용한 파손된 금속정 제거술
- 증례 보고 -

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항회전 근위 대퇴 골수정의 지연 나사 삽입구 부위에서 발생한 금속정 파괴에 대한 증례 보고와 구형 유도핀과 K 강선을 사용하여 좁은 내경을 갖는 파괴된 금속정의 제거술기를 소개하고자 한다.

색인 단어: 골수강내 정, 제거술, 구형 유도핀, K 강선

Removal of a Broken Intramedullary Nail with a Narrow Hollow Using a Bulb-tipped Guide Wire and Kirschner Wire
- A Case Report -

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To report the unusual failure of proximal femoral nail antversion (PFNA) at the level of lag screw hole and introduce a simple technique for removal of a broken intramedullary nail with a narrow hollow using a bulb-tipped guide wire and Kirschner wire.

Key Words: Intramedullary nail, Narrow hollow, Bulb-tipped guide wire, Kirschner wire

As the indications and popularity for intramedullary (IM) nailing have expanded to the metaphyseal fractures of femur and tibia, the incidence of nail breakage has also increased. For such complication, exchange nailing is a simple, less invasive and effective procedure for selected patients for nonunion after IM nailing. However, the removal of the broken nail is an inevitable and cumbersome procedure for exchange nailing. The surgeon must be prepared to face this complication and needs to be familiar with as many methods as possible. A broken distal part of the nail is sometimes very difficult to be removed from the medullary canal via the entry hole. It becomes even more difficult if the distal part is tightly fitted in the medullary canal and has a narrow hollow. Herein we report the details of the technique that we had tried with the literature review.

CASE REPORT

A seventy-five year old woman sustained subtrochanteric fracture of left femur after a fall accident. She took alendronate for 5 years for the treatment of osteopenia. The initial preoperative hip radiographs showed hypertrophy of the lateral cortex and transverse...
fracture with the medial beak. She underwent closed reduction and internal fixation with a long proximal femoral nail-antirotation (PFNA, Synthes, Paoli) at a local hospital. However, the reduction of the proximal fragment was not good enough and showed flexion deformity at the fracture site (Fig. 1). Nonunion and hardware failure developed at seven months after the operation (Fig. 2). Then, she was referred to our department for further treatment. Removal of the broken nail, exchange cephalomedullary nailing and bone graft was planned. The patient was placed on the operating table in supine position under the general anesthesia. A proximal part of the broken nail, a blade and distal interlocking screws were removed through the previous incision. The nail size was confirmed as PFNA 10 mm. A bulb-tipped guide wire was passed to the distal fragment of the nail through the entry point and medullary canal (Fig. 3). Once the bulb-tipped wire passed the distal fragment, we tried to put another straight guide wire into the distal fragment but failed due to its narrow hallow. As an alternative strategy, we introduced a 10 mm-long no. 3 Kirschner wire (K-wire) into the distal interlocking hole of the nail through the pre-existing distal interlocking hole at the distal femur using a straight hemostatic forceps. The length of the K-wire matched with the size of the nail imprinted on the proximal part of the removed nail. A wire was pushed further into the interlocking hole using a blunt no 3 Steinmann pin (Fig. 4). Then, bulb-tipped guide wire was gently pulled out until the bulb abutted and locked with the K-wire at the distal interlocking hole. The guide wire was held using a holder, and it was tapped with a slotted hammer (Fig. 5). After removing the distal fragment, a new cephalomedullary nail (11 mm,