

Intramedullary nail extraction of maximum number, nine ender's nails including one broken nail from long bone of an adult patient - A Rare Case Report.



Orthopaedics

KEYWORDS: Broken nail, Ender's nail, Intramedullary nail extraction, Tibia.

Dr.Ghaniuzzoha Asadi

[M.B.B.S, M.S.(Ortho)] Specialist Medical Officer In Orthopaedics
Sant Muktabai Municipal General Hospital, Ghatkopar(W).Mumbai.

ABSTRACT

Though intramedullary nail extraction is not an uncommon procedure in orthopaedic surgery but removal of broken nail is a challenging procedure. Ender's nail is an intramedullary device used to treat pediatric long bone fractures. These nails have poor rotational stability and multiple nails are required for fracture stability. In adults interlocking intramedullary nail is the standard implant of choice for fracture shaft of long bones. We report a rare case of 45 year old female who was operated six years ago with multiple ender's nail stacking for fracture shaft of tibia presented with discharging sinus. She was operated upon and nine ender's nail including one broken nail was removed successfully. With this case we want to report maximum number of intramedullary nails removed from a long bone.

Introduction :- Though intramedullary nail extraction is not an uncommon procedure in orthopaedic surgery but removal of broken nail is a challenging procedure. In general the proximal portion of broken nail is routinely removed without difficulty while challenge remains in distal fragment removal. Meticulous pulling of broken nail distal fragment is ideal for nail removal [1]. Ender's nail is an intramedullary device used to treat pediatric long bone fractures. These nails have poor rotational stability and multiple nails are required for fracture stability [2]. However in adults locked intramedullary nailing is the standard implant of choice for fracture shaft of long bones [3]. We report a rare case of management of fracture shaft of tibia with multiple ender's nail in an adult operated upon for implant removal and nine ender's nails including one broken nail was removed.

Case Report :-

45 year old female presented to orthopaedic opd with chief complaint of pus discharging sinus from previous operative incision site on medial side of upper left leg since one year. She gave history of being operated six years ago for fracture shaft tibia with intramedullary nail. On physical examination there was seropurulent discharging sinus on medial incision scar. Patient was full weight bearing, walking without limp and no limitation of knee range of movement. Neurovascular examination was normal. Plain Radiograph of left tibia in AP & Lateral view obtained. Radiograph suggested a completely united tibial diaphyseal fracture in all 4 cortices with multiple enders nail insitu and cortical thickening at fracture site. (Fig 1 & 2). A diagnosis of old united fracture shaft tibia with multiple ender's nail insitu with infection was made. Patient was posted for implant removal. Thorough preoperative planning and preparation done to successfully extract nails.

Patient supine on OT table under spinal anaesthesia. Incision taken over previous incision scar. Seropurulent material was collected in sterile container for microbiological examination (pus culture and antibiotic sensitivity). Tip of ender's nail exposed and one by one eight ender's nails removed under vision, four each from lateral and medial entry site. Ninth nail was broken from tip. The proximal portion of broken nail removed with ease. But to remove distal portion of nail, standard infrapatellar incision taken. Entry point made in centre of medullary canal with awl. Proximal part of medullary canal reamed with no.9 and no.10 cannulated reamers to enlarge and open up medullary canal to provide room for extraction of distal part of broken nail. Under C-arm guidance, while reaming with no.10 reamer, the tip of broken nail's distal part was intentionally engaged in reamer and was meticulously and carefully pulled out of canal. Removal of nine ender's nail done (Fig-3). Incision was closed in layers. Post-operative radiograph taken (Fig-4).

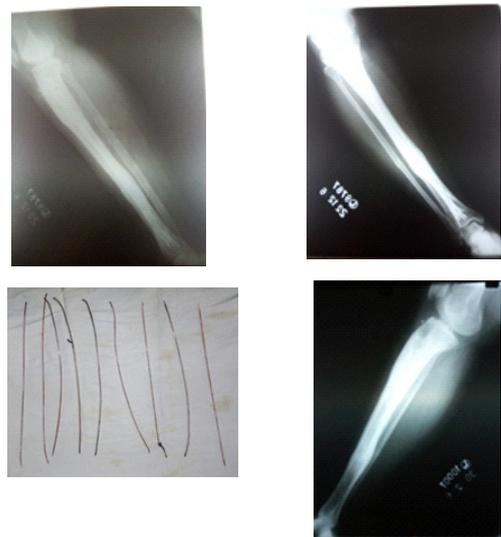


Fig-1&2:- Pre-operative Radiograph(multiple ender's nails) Fig-3:- Nine Ender's Nail including one broken. Fig-4:- Post-operative Xray

Discussion:- Many surgical techniques have been mentioned to successfully remove intramedullary nail especially broken nail [4-6]. For broken nail distal portion can be removed by pulling retained fragment from proximal end of the canal. Pulling is the preferred method. Meticulous and careful pulling brings expected result. Literature clearly mentions ender's nail as the preferred intramedullary nail to treat pediatric long bone fractures and locked intramedullary nail for adult diaphyseal fracture long bones [2-3].

Conclusion:- Intramedullary nail extraction requires patience. During procedure one should be prepared to change and adapt the nail removal strategy as specific case dictates. Thorough preoperative planning and preparation are necessary to successfully extract nail especially broken nail.

References:-

1. E.Liodakis, C.Krettek, M.Kenawey, and S.Hankemeier: "A new technique for removal of an incarcerated expandable femoral nail," *Clinical Orthopaedics and Related Research*, vol. 468, no. 5, pp.1405-1409, 2010.
2. Lee SS, Mahar AT, Newton PO. Ender nail fixation of paediatric femur fractures: a biomechanical analysis. *J Pediatr Orthop (Am)*. 2001; 21:442445
3. Campbell's Operative Orthopaedics; S.Terry Canale, MD, James H.Beaty, MD, Vol.3 part XV chapter 54.2013; page 2650-2656.]
4. J.L.Franklin, R.A.Winquist, S.K.Benirschke and S.T.Hansen Jr. ., "Broken intramedullary nails," *Journal of Bone and Joint Surgery A*, vol.70, no.10, pp.1463-1471, 1988.
5. D.J. Hak and M. McElvany, "Removal of broken hardware," *Journal of the American Academy of Orthopaedic Surgeons*, vol. 16, no.2, pp.113-120, 2008.
6. H. Whalley, G. Thomas, P. Hull, and K. Porter, "Surgeon versus metalwork: tip store remove a retained intramedullary nail fragment," *Injury*, vol.40, no.7, pp.783-789, 2009.