



Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/13777
DOI URL: <http://dx.doi.org/10.21474/IJAR01/13777>



RESEARCH ARTICLE

REMOVAL OF STUCK FEMUR INTERLOCKING NAIL BY LONGITUDINAL OSTEOTOMY OF FEMUR - A CASE REPORT

Dr. Neetin P. Mahajan, Dr. Tushar Patil, Dr. Kartik Pande and Dr. Kunal Chaudhari

Manuscript Info

Manuscript History

Received: 25 September 2021

Final Accepted: 27 October 2021

Published: November 2021

Abstract

Introduction: Gerhard Kuntscher first introduced the technique of intramedullary nailing in 1940s. It is a clover leaf shaped hollow tubular nail for intramedullary fixation of long bones. This nailing system has been a technological breakthrough for femur fixation which can be both anterograde or retrograde.

Case Report: A 34 year old Male patient resident of Shahapur brought by relatives to JJ hospital, with chief complaint of pain at left knee since 8 days. Patient had A/H/O RTA after fall from bike in 31/12/2012 with head injury with left shaft femur fracture. Patient was operated at JJH with left femur ILN. History of head injury operated in JJ hospital with no details known to patient. There was also history decreased vision in left eye since trauma.

Discussion: Interlocking intramedullary nails are used as gold standard treatment in majority of tibial and femoral diaphyseal fractures. It can be removed in certain circumstances when it causes soft tissue irritation, prominent locking screws, implant failure, infection, nonunion, malunion etc.

Conclusion: This study shows that in removal of stuck or bent femur interlocking nails in which all other closed techniques have failed, open longitudinal femoral osteotomy with retrograde hitting of the nail can effectively aid in successful removal of nail.

Copy Right, IJAR, 2021., All rights reserved.

Introduction:-

Gerhard Kuntscher first introduced the technique of intramedullary nailing in 1940s.[1]

It is a clover leaf shaped hollow tubular nail for intramedullary fixation of long bones. This nailing system has been a technological break through for femur fixation which can be both anterograde or retrograde.[2]

Removal of the nail can be done routinely once its function has been served or if there are other complications necessitating its removal but can be very challenging.[3]

Incidence of broken impacted kuntscher nails are stated to be 1-3.3%. Excessive callus formation, bony ingrowth and/or bent or broken nails complicate its removal. [2]

Factors contributing to implant failure have been described by Franklin and Hahn as design of implant, stability and site of fracture.[4]

A number of techniques and instruments have been described for removal of a stuck femur interlocking nail like use of hook or stacked wires. Also, the available universal extraction sets usually fail. Hence the biggest challenge arises when all these nail removal techniques fail.[3]

Case Report:

A 34 year old Male patient resident of Shahapur brought by relatives to JJ hospital, with chief complaint of pain at left knee since 8 days. Patient had A/H/O RTA after fall from bike in 31/12/2012 with head injury with left shaft femur fracture. Patient was operated at JJH with left femur ILN. History of head injury operated in JJ hospital with no details known to patient. There was also history decreased vision in left eye since trauma.

Then patient had pain with difficulty to walk since 8 days with no history of recent trauma and wanted to get the implant removed.

There was mild local tenderness on lateral aspect of left knee, range of motion was unrestricted without any swelling or wound or local signs of infection.

X rays revealed 1 broken distal locking screw with nail bent proximally.

Surgical technique:

Patient was taken in operating room in lateral position. Under spinal plus epidural anaesthesia, patient induced. Scrubbing, painting and drapping done. Greater trochanter palpated and incision taken on previous surgical scar of entry site, soft tissues dissected, excess callus nibbled and nail tip identified. Nail removing zig attached to proximal tip of nail.

Distally incision taken over previous surgical scar of distal locking site, soft tissues dissected and excess callus nibbled. Broken screw head identified, screw driver attached and unscrewing done. The broken screw was removed by simple unscrewing the screw head and removing the proximal part after which 4mm steinman pin was passed to push out the broken screw parts medially and then artery forceps were used under image intensifier to catch and remove those broken parts. Then remaining 1 distal and 2 proximal screws were removed in similar manner.

Back hammering of proximal nail tip was done till nail bend after which the nail broke. Then femur shaft was exposed with longitudinal anterolateral incision over mid thigh. Longitudinal femoral osteotomy was then performed from just below the nail tip to proximally till lesser trochanter and gradually nail was hammered distally to push out proximally and then the two encirclage wires on proximal femur were done. The bone defect was filled with bone graft and closure was done with drain.

Checkdress done on day 3 and day 7 were found to be healthy.

Suture removal done on day 11.

Patient was advised nil weight bearing walk with walker for 6 weeks.

Preoperative X RAYS :**Postoperative X RAYS :****Discussion:-**

Interlocking intramedullary nails are used as gold standard treatment in majority of tibial and femoral diaphyseal fractures.[5]

It can be removed in certain circumstances when it causes soft tissue irritation, prominent locking screws, implant failure, infection, nonunion, malunion etc.[5]

Before operating, the surgeon should analyse the degree of angulation on both radiographs, thickness of the nail, localisation of the bend, material of implant, pattern of fracture and quality of bone, then choose a proper technique. [5]

Increased load on bone can lead to deforming and bending forces on nail depending on weight and level of activity of patient.[6]

Nail breakage is usually caused by nonunion which requires its removal and is a challenging procedure.[7]

The use of a hook to engage the distal tip of nail is most tried and tested modality to remove cannulated intramedullary nail. Also it is least technically demanding and requires simple instruments.[8]

Most common technique is to pull the nail from its entry point but slippage of the extraction device has been a major concern for failure. In such cases disimpacting the nail from the fracture site can be used as an alternative.[2]

There are few techniques in removing a stuck or bent intramedullary nail like insitu straightening via external force on femur, sectioning the nail and removing each nail piece separately and sectioning nail to half its diameter and then breaking it.[9]

Broken fragments of intramedullary nail can be removed effectively by either engaging at proximal end, hooking at distal end, using a pushing device to hammer it proximally or distally or removing them through bone either with an osteotome or at fracture site.[8]

The operating surgeon planning to remove the nail should consider a possibility of incarcerated nail, inform the patient and take consent preoperatively and plan a course of action if the nail cannot be removed.[1]

Conclusion:-

This study shows that in removal of stuck or bent femur interlocking nails in which all other closed techniques have failed, open longitudinal femoral osteotomy with retrograde hitting of the nail can effectively aid in successful removal of nail.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References:-

1. Seligson D, Howard PA, Martin R. Difficulty in removal of certain intramedullary nails. *Clinical Orthopaedics and Related Research* (1976-2007). 1997 Jul 1;340:202-6.
2. Kumar V, Arora C, Aggarwal S. Small Incision Osteotomy: An Innovative Approach for Removal of Impacted Kuntscher Nail. *Journal of Clinical & Diagnostic Research*. 2019 Jan 1;13(1).
3. Marí-Molina R, Valverde-Vilamala D, León García A, Guirro Castellnou P, Marqués López F. A Technical Note for Extracting an Incarcerated Femoral Kuntscher Nail.
4. Marwan M, Ibrahim M. Simple method for retrieval of distal segment of the broken interlocking intramedullary nail. *Injury*. 1999 Jun 1;30(5):333-5.
5. Kose O, Guler F, Kilicaslan OF, May H, Yuksel HY. Removal of a bent intramedullary nail in lower extremity: report of two cases and review of removal techniques. *Archives of orthopaedic and trauma surgery*. 2016 Feb 1;136(2):195-202.
6. Sonanis SV, Lampard AL, Kamat N, Shaikh MR, Beard DJ. A simple technique to remove a bent femoral intramedullary nail and broken interlocking screw. *Journal of Trauma and Acute Care Surgery*. 2007 Aug 1;63(2):435-8.
7. Pongsamakthai W, Apivatthakakul T, Sangkomkamhang T. Removal of the broken femoral nail with T-reamer technique: A three-case report. *Journal of clinical orthopaedics and trauma*. 2016 Oct 1;7:22-6.
8. Whalley H, Thomas G, Hull P, Porter K. Surgeon versus metalwork—Tips to remove a retained intramedullary nail fragment. *Injury*. 2009 Jul 1;40(7):783-9.
9. Sakellariou VI, Kyriakopoulos S, Kotoulas H, Sofianos IP. Bent intramedullary femoral nail: surgical technique of removal and reconstruction. *Case reports in orthopedics*. 2011 Oct 12;2011.