

# Anterior Knee Pain after Intramedullary Nailing of Fractures of the Tibial Shaft

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## ABSTRACT

**Introduction:** Intramedullary nailing is the treatment of choice for displaced tibial shaft fractures in adults. Chronic anterior knee pain at the insertion site of the nail is the most frequently reported complication of closed nailing. The cause of knee pain is still unclear. Many etiological factors have been put forward. **Aim of the Study:** The aim of the study was to determine the incidence and the factors leading to anterior Knee pain following tibial nailing. **Materials and Methods:** A retrospective analysis of patients treated by tibial nailing in our hospital from the year January 2015 to December 2017 was done. Groups of 85 patients with 86 tibial fractures were studied. Their clinical record radiographs were analyzed. Patients were contacted and interviewed. **Results:** At a mean follow-up of 2 years, 48 patients (55.81%) had knee pain. 20 patients had nail protrusion, of which 9 had knee pain. 14 patients had nail removed, of which 8 had complete pain relief. **Conclusion:** Based on our findings, there was no correlation between nail protrusion and knee pain. Nail removal helped in relieving pain. The causes of knee pain after tibial nailing are multifactorial and require further evaluation.

**Key words:** Anterior knee pain tibia nailing, Anterior knee pain nailing tibial shaft fracture

## INTRODUCTION

Intramedullary nailing is the treatment of choice for displaced tibial shaft fractures in adults. Chronic anterior knee pain at the insertion site of the nail is the most frequently reported complication of closed nailing. The cause of knee pain is still unclear. Many etiological factors have been put forward.

### Aim of the study

The aim of the study was to determine the incidence of anterior knee pain and to assess the various etiological factors of knee pain.

## MATERIALS AND METHODS

A retrospective study was conducted on 85 consecutive patients treated for 86 tibial fractures (January 2015 to December 2017). Patients were contacted and interviewed. Clinical records and radiographs were analyzed. Age and sex of a patient, operative approach used, and further follow-up

notes were assessed. The amount of nail protrusion was also assessed. The patients who underwent nail removal were assessed for pain relief.

## RESULTS

A total of 85 patients with 86 tibial fractures were studied. The patients were followed up for a mean period of 2 years. The age group ranged from 18 to 72 with a mean age of 45 years. 64 patients were males and 21 patients were females. Split patellar approach was used in all patients. 48 of 85 patients had anterior knee pain. 20 patients had nail protrusion, of which 9 patients had knee pain. Of the 48 patients, 14 patients underwent nail removal. 8 of the 14 patients had significant pain relief.

## DISCUSSION

Anterior knee pain is one of the common complications after nailing for tibial shaft fractures. Many etiologies for anterior

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knee pain have been put forward. The main among them is operative approach point of nail insertion and nail protrusion. Two approaches are used for tibial nailing. One is split patellar and other is parapatellar approach. Keating *et al.*,<sup>[1]</sup> in their study, had come to conclusion that parapatellar tendon incision is ideal. Toivanen *et al.*,<sup>[2]</sup> in their study, noted that there was no significant difference in knee pain in either split patellar or parapatellar approach. We, in our study, had used split patellar approach in all our patients and found an incidence of 55.81% of knee pain. Review of literature had showed a similar incidence of knee pain following split patellar approach.

The nail protrusion is one of the causes for knee pain. Orfaly R *et al.*,<sup>[3]</sup> in their study, had come to conclusion that there was no correlation between nail protrusion and knee pain. This was further supported by Toivanen *et al.*<sup>[2]</sup> in their study. However, Yu *et al.*,<sup>[4]</sup> in their study, had come to conclusion that nail protrusion was one of the contributing factors for knee pain. We, in our study, found no correlation between knee pain and nail protrusion.

The role of nail removal in reducing knee pain has been extensively supported in literature. Most authors found that nail removal significantly reduces knee pain. We, in our study, found significant pain relief after nail removal in 8 of 14 patients. This also supports the theory that anterior knee pain could be due to bending strain by proximal part of the nail in the bone.

The entry point in the tibia, damage to tendon or muscle, scar sensitivity, and metal dissemination are other causes for knee pain. If the entry point is too high, the risk of unrecognized articular penetration and risk of damage to intra-articular

structures are there as concluded by Hernigou and Cohen<sup>[5]</sup> in his study. Large diameter of nail causes more of articular damage. Metal dissemination causes local and systemic side effect. This area needs to be further evaluated.

We conclude that anterior knee pain is found in 55.81% of patients with split patellar approach. There is no correlation between nail protrusion and knee pain. Implant removal definitely reduces anterior knee pain. Anterior knee pain is due to multifactorial cause, which needs further evaluation.

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