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FUNCTIONAL OUTCOME OF EXPERT TIBIA NAIL IN UPPER THIRD TIBIA FRACTURES IN A TERTIARY CARE CENTER

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Abstract

Introduction: Of all the bones in the body, the tibia is the largest and most commonly fractured. Because of high velocity trauma brought on by a rise in vehicle and industrial accidents, tibial fractures are becoming increasingly frequent. Due to its precarious blood supply and scant coverage of soft tissues, orthopaedic physicians worldwide have been fighting infections and union problems. This study analyzed nailing in cases of extra-articular fractures of the proximal tibia

Materials & methods: A prospective study on 75 cases of extra articular proximal tibia fractures admitted and treated surgically in Orthopaedic Dept. of Karwar institute of medical sciences for a period of 12 months. Data was collected using structured proforma, questionnaire and functional outcome analysed based on modified KLEMM and Borner Score.

Results: The study included 75 patients with proximal third tibia fracture. The age of the patients ranged from 19 years to 65 years. Males (74%) were predominant in our study. Most had right sided involvement (78%).Of total 75 cases 64 were closed fractures which consists around 85% and rest 15% were open. The mean Modified Klemm and Borner score was 15.33 (Range 9-19). Of total 75 cases 57 cases (76%) had excellent score, 17 cases (22.6%) had good score and remaining one case had fair score.

Conclusion: - From our study we conclude that expert intramedullary nailing of proximal third extra-articular fracture with correct placement of Poller screws, lateral entry point and multiple proximal locking allowed early mobilization of knee joint with excellent functional outcome.

Keywords: Poller screws, Modified Klemm and Borner score, proximal third tibia fracture.

Introduction: The longest bone in the body to fracture most frequently is the tibia. Because of its location and the absence of soft tissue protection on the antero-medial aspect, the tibia is prone to injury. Proximal tibial fractures are more challenging for orthopaedic surgeons to treat, especially extra-articular proximal tibial fractures, which make up 5–11% of all tibial fractures because they are more likely to involve compartment syndrome, vascular damage, and musculo-ligamentous injury. Different surgical techniques, including open reduction and plating [1-3], intramedullary nailing, and external fixation are available for treating proximal tibial fractures. An important improvement in the intramedullary nailing of proximal tibial fractures was the creation of modern implants such as the Expert Tibial Nail. In addition to the standard static and dynamic locking options, the ETNS provides multi-directional locking options in the proximal and distal regions of the nail.

Materials and methods: The study was carried out on patients at the Karwar Institute of Medical Sciences' Department of Orthopaedics who had proximal tibia fractures and were receiving professional tibia nail treatment. 75 patients with proximal third tibia fractures were included in the study. Out of the 75 total patients, 64 (or around 85%) had closed fractures, whereas the remaining 15% had open fractures. An expert intramedullary nailing system was used to treat each fracture. An incision is made parallel to the intramedullary canal's central axis. Starting at the distal portion of the patella, the incision extends proximally down the patellar ligament and ends at the tibial tuberosity [3]. The canal's entry point is aligned with the lateral tubercle of the intercondylar eminence and the axis of the intramedullary canal when seen anteroposterior [4] .In lateral view the entry point is at the ventral edge of the tibial plateau [5]. Closed reduction was done and a guide wire was inserted. Serial reaming was carried out in accordance with the medullary canal's availability following poller screw fixation. Insertion of the appropriate size nail after connecting securely to the proximal jig is done with the knee semi extended and holding the reduction under image guidance. Postoperative antero-posterior and lateral X-rays were taken [6]. All patients were encouraged to begin an early active range of motion of the knee and ankle as tolerated. Sutures were removed on the 10th post-operative day. Patients were not permitted to bear full weight for four weeks.

Results:

Age groups of patient varied from **19** years to **65** years. Mean ± Sd of Age was **36.57± 11.26** years. In. age was **19** years & Max. Age was **65** years. Right side involved in **59** cases, Left side involved in **16** patients. The study showed those **74%** males and **25%** females. The time duration of surgery of the patients varied from **56** mins to **110** mins Mean ± Sd of OT time was **73.32± 14.90** mins. The trauma to surgery time is represented below with most of the patients operated in an interval of **1** to **2** days post-trauma. Mode of injury was RTA (Road traffic accident) in **70** patients and Self-fall in **5** patients. Out of the 70 patients **5** had Apex anterior 45 angulations more than **5º**, 6 patients had Valgus malalignment. However, the average angular alignment in the sagittal plane was less than **4º** and in the coronal plane was less than **2º**. Delayed union was seen in **9** cases. The mean Modified Klemm and Borner score was **15.33** (Range 9-19). Of total 75 cases **57** cases (76%) had excellent score, **17** cases (22.6%) had good score and remaining **1** case had fair score.

Modified Klemm Borner Score	Frequency	Percent
Excellent	57	76.00
Good	17	22.67
Fair	1	1.33
Total	75	100.0

Discussion: According to literature, the incidence of extra-articular proximal tibial fractures ranges from 5 to 11% [7]. Vidhyadhara et al.'s [8] research indicates that road traffic accidents are the primary cause of extra-articular proximal tibial fractures [9]. Our study clearly shows that 70 of the 75 cases had a road traffic accident after they occurred. After six months, 88% of fractures exhibited union. After six months, there were nine occurrences of delayed unions [10]. In our study, the modified Klemm and Borner score has shown good performance in estimating the functional result. Of the nine cases of delayed union, two had an apex anterior malalignment of + 10 º, and four cases had valgus malalignments of +6 and +7 º. Freedman et al. [7] reported a primary malalignment of 58% prior to the use of newer implants and surgical methods to address these fractures. The overall malalignment has decreased in a number of studies by Rommens et al (17.6%), Josten et al (11.1%), Wysocki et al (6.6%), Bolhofner et al (2%), and Nork et al (8.1%) thanks to surgical breakthroughs and the use of expert nails. Six of the seventy patients in our study showed Valgus malalignment, and five of the patients had Apex anterior 45 angulations greater than 5º. However, the average angular alignment in the sagittal plane was less than 4º and in the coronal plane was less than 2º.According to Hansen et al., the average anterior bow deformity in proximal third fractures was 7º(5º–12º), and the average coronal plane angulation was 2ºvalgus (2ºvarus to 12º valgus). All 21 tibial fractures treated with IM nailing and blocking screws went on to union, according to the study by Krettek et al.; the mean coronal alignment was -1.0° (range: - 5° to 3°) and the mean sagittal alignment was 1.6° (range: - 6° to 11°).In spite of a short proximal part, stability and alignment can be guaranteed by the use of multidirectional interlocking screws. The most frequent deformity that results from nailing these fractures is valgus malalignment, which is caused by the proximal fragment's laterally directed nail insertion angle and medial nail entry point.

Conclusion: Our study leads us to the conclusion that early knee joint mobilization with a good functional outcome was made possible by expert intramedullary nailing of the proximal third extra-articular fracture with appropriate Poller screw placement, lateral entry point, and multiple proximal locking. When used in conjunction with intramedullary nailing for extra articular proximal third fractures of the tibia, poller screws were useful in reducing fracture displacement and facilitating fracture alignment. In Expert nails' use of multidirectional interlocking screws guarantees that stability and alignment may be maintained even in the case of a short proximal segment.

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