ORIGINAL RESEARCH PAPER

Volume - 11 | Issue - 03 | March - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A PROSPECTIVE STUDY FOR FUNCTIONAL OUTCOME OF EXPERT TIBIA NAIL IN UPPER THIRD TIBIA FRACTURES

Orthopaedics

Dr. Ishaan Meena* Resident Doctor *Corresponding Author

Dr. S. K. Bhaskar Senior Professor

Dr. Laxmi Narayan Jajoriya Assistant Professor

ABSTRACT

Background: Out of the different options for surgical management of tibial fractures, intramedullary interlocking nail is found to be most effective in respect of early fracture healing, less soft tissue injury, less hospital stays and cosmetically better. In this study, we have evaluated the functional outcome of Expert Tibia Nail in upper third tibia fracture using Modified KLEMM and Borner Scoring System. **Method:** A prospective study of 40 patients was done in JLN Hospital, Ajmer presenting with extra articular proximal third tibia fracture Data related to demographics, mechanism of injury, details of trauma, hospitalization detail, operation description, post-operative rehabilitation, complications, clinical and functional outcome were collected during the period of hospital stay and follow up visits in the OPD clinic. Follow up was conducted regularly at the interval of 3 weeks, 6 weeks, 6 months, 1 year. On follow up, the patients were evaluated clinically and radiologically according to modified KLEMM and Borner scoring. **Result:** According to Modified KLEMM and Borner Scoring System 77.5% patients had excellent results, 15% had good results, 5% had fair results and 2.5% had poor result in nailing. **Conclusion:** From this study, after counting the score with the Klemm and Borner scoring system it has been concluded that Expert Tibia Nailing helps in early recovery of patient's functions with better rotational stability and minimal chances of non-union.

KEYWORDS

Expert Tibia Nail, Proximal Third Tibia

INTRODUCTION

The Tibia is the most commonly fractured long bone in the body and is increasing in frequency due to industrialisation, growing population and highly velocity trauma due to motor vehicle accidents.

The treatment of metaphyseal fractures of tibia remains challenging, because of the sagittal and coronal malalignment. Establishment of length and prevention of the coronal, sagittal, rotational malalignment is the at most importance during fixation.

Numerous treatment options exist for treating tibial fractures. To reduce the complications associated with conservative treatment, tendency towards operative management of tibial fractures is in vogue. Various operative methods like open reduction and plating, intramedullary nailing and external fixation1-3, have their own indications, advantages and disadvantages. Interlocking nail has widened the range of indications for medullary osteosynthesis of tibial shaft fractures to include almost every type of fracture. The major advancement in intra medullary nailing of proximal tibial fractures was the introduction of modern implants like the Expert Tibial Nail.

The Expert Tibial Nail was introduced worldwide in 2005 as a universal intramedullary implant for tibial fractures. It is indicated for fractures in the tibial shaft as well as for metaphyseal and certain intra-articular fractures of the tibial plateau and the pilon fracture.

The numerous multiplanar locking options at the proximal and distal end allow for secure stabilisation of metaphyseal fragments. Certain intra-articular tibial fractures can be addressed by intra-medullary nailing in combination with other implants which includes interlocking bolts. In the proximal metaphysis spongious bone, screws achieve an optimized purchase in the cancellous bone. Multi directional inter locking screws ensures that alignment can be well maintained and stability preserved in short proximal or distal tibial segments. The end cap achieves angular stability between the proximal oblique screw and nail. These changes in implant design enhance the stability of the bone nail construct and reduce the risk for secondary malalignment4.

The present study was undertaken to determine efficacy of Expert Tibia Nail in management of Proximal Third Tibial Fractures using the Modified KLEMM and Borner Scoring System.

Table 1: Modified KLEMM and Borner Scoring System

Final Score	ROM Knee & Ankle	Muscle Atrophy	Alignment	Pain	Union
Excellent	4	3	4	4	4
Good	3	2	3	3	3
Fair	2	1	2	2	2
Poor	1	0	1	1	1

Excellent: 15-19 Fair: 5-9
Good: 10-14 Poor: 0-4

MATERIAL AND METHODS

A Hospital based Prospective study was conducted on 40 patients, admitted in Department of Orthopaedics, JLN Medical College, Ajmer during the period of November 2019 to October 2021, of extra articular proximal third tibia fracture who are surgically managed with Expert Tibia Nail.

Data Collection:

Skeletally mature patients with Closed or Gustilo Anderson type 1 compound Proximal Tibial fracture were included in this study. Data was related to demographics, mechanism of injury, details of trauma, hospitalization detail, operation description, post operative rehabilitation, complications, clinical and functional outcome were collected during the period of hospital stay and follow-up visits in the OPD clinic. Follow up was conducted regularly at the interval of 6 weeks, 3 months, 6 months, 1 year and at yearly intervals.

Data analysis: Data was analysed using parametric or non-parametric tests based on the distribution of the values obtained. Continuous data was summarized in form of mean and SD. Count Data was summarized in form of proportion.

RESULT

Out of 40 patients, overall outcome in 31 patients (77.5%) was excellent, 6 patients (15%) were good, 2 patients (5%) were fair and 1 patient (2.5%) was poor according to Modified KLEMM and Borner Scoring System. (Table 1)

Most of the patients (80%) were of age group 18-40 years with the mean age being 32 years. 75% were male and 25% were female patients. (Table 2)

Most common mode of injury was RTA in 85% of patients followed by fall from height (10%) and assault (5%).

Among 40 patients, 4 patients were undergone open reduction and rest all 36 patients had undergone closed reduction.

About 40% of patients had postoperative complications. Most presented complication was anterior knee pain in 10 patients. 5

patients presented with superficial skin infection which got healed by regular dressings. Only 1 patient presented with deep infection. (Table 3) 24 patients had no complaints of pain at fracture site on follow up. 14 patients complaint of pain at fracture site only on prolonged weight bearing. 1 patient complaint of pain on weight bearing and 1 patient had rest pain at fracture site.

On follow up, 20% patients presented with valgus deformity and 2.5% presented with varus deformity. No recurvatum or procurvatum deformity found in any patient. (Table 4)

Fig 1: Preoperative X-rays

Fig 2: Postoperative X-rays

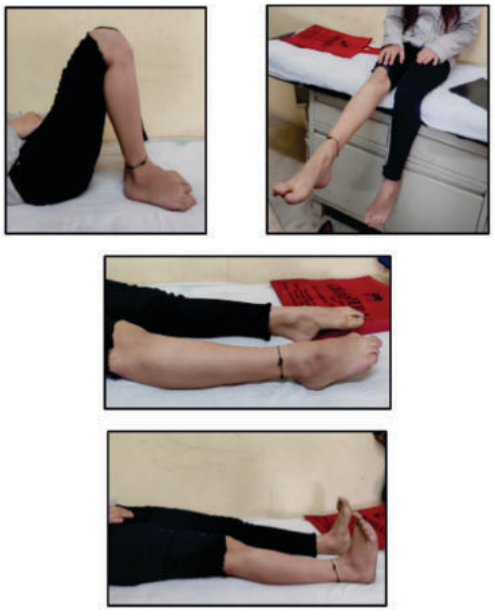

Fig 3: Postoperative Range of Motion in Knee and Ankle Joint

Table 2: Final Outcome

S. No.	Outcome	No. Of Patients	Percentage
1	Excellent	31	77.50
2	Good	6	15.00
3	Fair	2	5.00
4	Poor	1	2.50
	TOTAL	40	100.00

Table 3: Age Distribution

S. No.	Age Group (Years)	No. of Patients	Percentage
1	18-30	21	52.5
2	31-40	13	32.5
3	41-50	3	7.5
4	51-60	3	7.5
	TOTAL	40	100

Table 4: Complications

S. No.	Complications	No. of Patients	Percentage
1	Superficial Skin Infection	5	12.5
2	Deep Infection	1	2.5
3	Anterior Knee Pain	10	25

Table 5: Alignment At Final Follow-up

S. No.	Alignment at Final Follow-Up	No. of Patients	Percentage
1	Valgus	8	20
2	Varus	1	2.5
3	Procurvatum	0	0
4	Recurvatum	0	0

DISCUSSION

Use of the intramedullary nail system is found beneficial in wide spectrum of tibial fractures. The new, multidirectional locked intramedullary system involves multiple locking options in different planes at the proximal ends which ensures that the alignment is maintained, and that stability is preserved despite a short proximal segment. The system has an angular stability locking system that enhances the axial and lateral stability of the fracture fragments. All the designed modifications allow for better fixation of metaphyseal tibial segments through multiple interlocking holes in close proximity to either end of the nail.

We evaluated our results and compared them with those obtained by various other similar studies to determine efficacy of Expert Tibia Nail in management of Proximal Third Tibial Fractures.

Present study revealed the mean age of patients with such injuries to be 32.75 years (range 19-60 years). It is comparable with a study on similar fractures conducted by below authors.

Table 6: Age Distribution in Different Studies

STUDY	MIN	MAX	MEAN
Vidyadhara S et al[5]	18	67	43
Nork Se et al.[6]	19	73	42
S B Kadam et al.[7]	19	60	33.6
Dr. Prabhav Tijoriwala et al[8]	20	80	38
Present Study	19	60	32.75

Malalignment with Valgus was seen commonly and is comparable.

Table 7: Malalignment in Different Studies

MALALIGNMENT	VALGUS	VARUS	PROCURVATUM	RECURVATUM
Vidyadhara S et al.[5]	4	1	7	5
Nork SE et al.[6]	1	2	0	0
S B Kadam et al.[7]	5	0	7	2
Present Study	8	1	0	0

In S B Kadam et al[7] study, 35% patients complaint of anterior knee pain after interlocking nail in proximal shaft tibia fracture. In our study, only 25% patient had anterior knee pain after expert tibia nailing in proximal third tibia fracture.

Final result was comparable with other similar study; according to Modified KLEMM and Borner Scoring System.

Table 8: Final Outcome in Different Studies

STUDY	EXCELLENT	GOOD	FAIR	POOR	TOTAL
Dr. S K Venkatesh Gupta et al[9]	24	10	4	2	50
Dr. Prabhav Tijoriwala et al[8]	15	5	-	-	20
Present Study	31	6	2	1	40

CONCLUSION

In our study, after counting the score with the Klemm and Borner scoring system it has been concluded that Multidirectional locked

nailing provides better rotational stability as compared to conventional nailing system.

It also offers advantages in terms of range of motion, blood loss, mean operating time, hospital stay, full weight-bearing time and union time and infection rate. Nailing helps in early recovery of patient's functions with minimal chances of non-union.

REFERENCES

1. Heckman JD, Sarasohn- Kahn J. The economics of treating tibia fractures. The cost of delayed unions. Bull Hosp Jt Dis. 1997;56(1):63-72.
2. Puno RM, Teynor JT, Nagano J et al. Critical analysis of results of treatment of 201 tibial shaft fractures. Clin Orthop Relat Res. 1986; 212:113-21.
3. Lottes JO. Blind nailing technique for insertion of the triflange medullar nail: report of three hundred nailing for fractures of the shaft of tibia. J Am Med Assoc. 1954;155(12):1039-42.
4. Gorczyca JT, Mckale J, Pugh K, Pienkowski D. Modified tibial nails for treating distal tibia fractures. J Orthop Trauma, 2002;16:18-22.
5. Vidyadhara S, Rao SK. Prospective study of the clinic and radiological outcome of interlocking nail in proximal third tibial shaft fractures. Injury, Int. J. Care Injured.2006; 37:536-42.
6. Sean E Nork, David P.Barei, Thomas A schildhauer et al Intramedullary nailing of proximal quarter tibial fractures J orthop Trauma. Volume 20,number 8, sep 2006:523-8.
7. Dr. Sagar Balasaheb Kadam, Dr. Umesh Nagrale, Dr. Irfan Sheikh, Dr. Tirth Vyas. A prospective study of outcomes of intramedullary nailing of proximal third shaft tibia fractures. Int J Orthop Sci 2017;3(3):683-690.
8. Dr. Prabhav Tijoriwala, Dr. Nirav kumar Moradiya, Dr. Keyur Vaghela. A study of functional outcome of expert tibia nail in upper third tibia fractures. Int J Orthop Sci 2019;5(3):15-21.
9. S K Venkatesh Gupta., et al. "A Comparative Study of Functional Outcome between Expert Tibial Nailing and Conventional IMIL Nailing for Proximal and Distal Tibial Fractures in Adults". Orthopaedic Surgery and Traumatology 2.1 (2018): 269-278.