

THE CLINICAL STATUS OF FRACTURE SHAFT FEMUR FIXATION BY TENSE IN CHILDREN AGES 6-14 YEARS

Dr. A. H. M. Azgar Ali Chowdhury^{*1}, Professor Dr. Alak Kanti Biswas², Dr. Md Somirul Islam³, Dr. A. K. M. Harun-Ar-Rashid⁴, Dr. Abdur Rahman⁵, Dr. Mohammad Shaha Alam⁶, Dr. A. T. M. Rezaul Karim⁷, Dr. Ayesha Begum⁸, Dr. Mohammad Ershad Alam⁶

¹Junior Consultant of Orthopedic Surgery, Chattogram Medical College Hospital, Chattogram, Bangladesh.

²Professor & Head Department of Orthopedics Chattogram Maa-O-Shishu Hospital Medical College, Chattogram.

³Associate professor, Chattogram Medical college Hospital, Chattogram

⁴Assistant Prof. of Orthopedic Surgery, Cox's Bazar Medical College, Cox's Bazar, Bangladesh.

⁵Assistant Prof. of Orthopedic Surgery, Chattogram Medical College, Chattogram, Bangladesh

⁶Assistant. Professor of Surgery, Cox's Bazar Medical College, Cox's Bazar, Bangladesh

⁷Consultant of Orthopedic Surgery, Parkview Hospital, Chattogram, Bangladesh

⁸Assistant Prof. of Pediatrics. Chattogram Medical College, Chattogram, Bangladesh.

***Corresponding Author: Dr. A. H. M. Azgar Ali Chowdhury**

Junior Consultant of Orthopedic Surgery, Chattogram Medical College Hospital, Chattogram, Bangladesh.

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ABSTRACT

Objective: In this study our main goal is to evaluate the clinical status of fracture shaft femur fixation by TENSE in children ages 6-14 years. **Method:** This comparative cross-sectional study was carried out at Chittagong Medical College Hospital (CMCH), Chittagong and private hospitals in Chittagong from January 2014 to December 2015. A total of 72 children with fracture shaft femur were included in the study. **Results:** During the study, in group-1 2.77% had pain where in group-2 it was 16.66%. Out of 72 patients the study showed that involvement was more on left side with non-significant p value. In both group minor complication is more frequently found with significant p value. **Conclusion:** From our study we can conclude that, majority of the patients were male, also pain other complication cases were found to be minor. Further study is needed for better outcome.

KEYWORDS: fracture shaft femur fixation, TENSE.

INTRODUCTION

Orthopedic surgeons often encounter diaphyseal femur fractures. Because these fractures most often result from high-energy trauma, one must have a high index of suspicious for complications or other injuries. The mainstay of treatment has been reamed interlocking intramedullary nailing, but a variety of treatment options now exist for solitary fractures or fractures with associated injury.^[1]

Before the 1900s, diaphyseal femur fractures were treated with various types of splinting. However, with the discovery of skeletal radiology near the end of the 19th century came an understanding of the forces acting on fractured bones and a change in the treatment of such injuries. Steinmann in 1907 and Kirschner in 1909 developed the first traction treatment modalities with the use of pins or wires under tension.^[2]

Early attempts at internal fixation of such fractures achieved little success until Küntscher developed and utilized the intramedullary nail in 1937. After a short

period of disagreement, the nailing method began to spread during World War II in Europe and later in North America. Intramedullary nailing became prominent in the United States in the 1970s. Since the intramedullary nailing technique was introduced in 1939, it has continued to evolve into the antegrade reamed interlocking nails that are the standard today.^[3]

Adult nonsurgical treatment options include skin traction, skeletal traction, cast brace, and casting. Nonsurgical options are used infrequently outside of the younger pediatric population. Children have the same options as well as spica casting for those patients weighing less than 80 lb.⁴ Surgical options in adults include the mainstays of intramedullary nailing, either antegrade or retrograde. Plate fixation and external fixation are used less frequently, but these have a place in the decision-making process for the ideal treatment in certain cases. In this study our main goal is to evaluate the clinical status of fracture shaft femur fixation by TENSE in children ages 6-14 years.

OBJECTIVE

- To assess the clinical status of fracture shaft femur fixation by TENSE in children ages 6-14 years.

METHODOLOGY

- Type of study:** This was a comparative cross-sectional study.
- Place and period of study:** This study carried out at Chittagong Medical College Hospital (CMCH), Chittagong and private hospitals in Chittagong from January 2014 to December 2015.
- Study population:** 6-14 years old child admitted in Chittagong Medical College Hospitals, Department of Orthopaedics Surgery and private hospitals in Chittagong.

- Sample size:**

A total number of 72 children with fracture shaft femur were included in the study due to time and financial constraints (according to inclusion and exclusion criteria).

Inclusion criteria

- Age 6-14 years old.
- Both sex group.
- Close fracture or Gustilo type 1.
- Those presented early within ten days after injury.
- Weight less than 49 kg.
- Transverse fracture.
- Minimally comminuted (Winquist 1)
- Short oblique fracture^[1]

Exclusion criteria

- Pathological fracture.
- Segmental fracture.

- Previous fracture in the same limb
- Patients presented after ten days.
- Subtrochanteric fracture.^[1]

Detailed procedure

- Data collection was done after taking informed written consent from each patient or from legal guardian who fulfilled the criteria. Initial evaluation by meticulous history and detailed clinical examination was done and recorded in a pre-designed structured form.

Data analysis

- Collected data were analysed using software SPSS (Statistical Package for Social Sciences) version 23 for windows. Descriptive and inferential statistics were used to analyse the data. Analysed data were presented in the form of tables and charts with due interpretation.

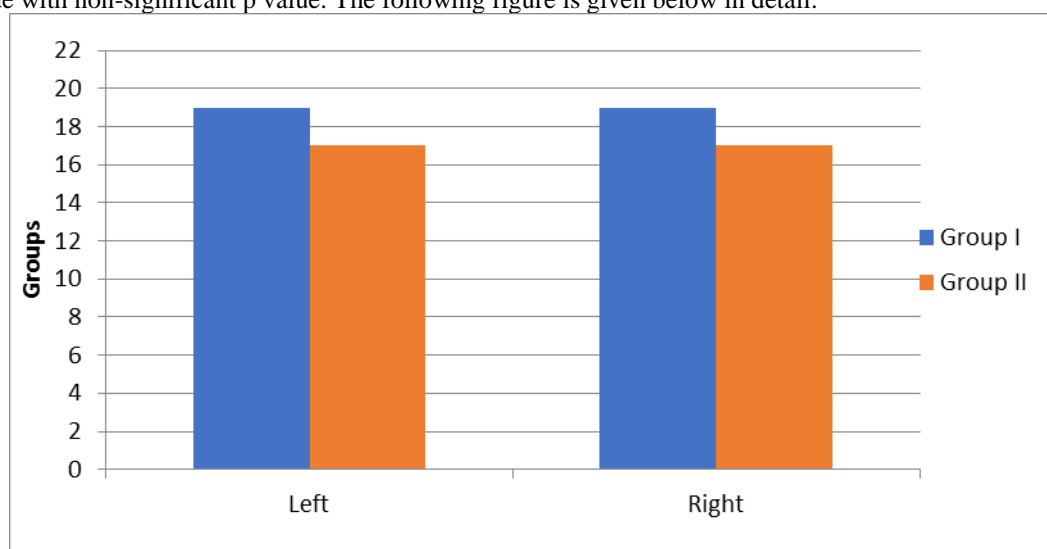
RESULT

In table-1 shows sociodemographic status of the patients where most of the patients in both groups were male and majority of the patients belong to 6-9 years age group. The following table is given below in detail:

Table 1: Sociodemographic status of the patients.

Age group	Group-1, n	Group-2, n
6-9 years	20	21
10-12 years	8	10
13-14 years	8	5
Gender	Group-1, n	Group-2, n
Male	20	21
Female	16	15

In figure-1 shows side distribution of the patients where out of 72 patients the study showed that involvement was more on left side with non-significant p value. The following figure is given below in detail:

**Fig 1: Side distribution (n. 36).**

In table-2 shows pain distribution of the patients where in group-1 2.77% had pain where in group-2 it was 16.66%. The following table is given below in detail:

Table 2: Pain distribution of the patients (n=36).

	Group-I (n=36)		Group-II (n=36)		P value
	No.	%	No.	%	
No	35	95.22	30	77.77	0.046
Yes	1	2.77	6	16.66	
Total	36	100.0	36	100.0	

- Statistical analysis was done by Chi-square test.
- Group-I = TENS cases.
- Group-II = Hip Spica cases.
- s= significant.
- n= number of patients in each group.

In table-3 shows limb length discrepancy where Out of 72 patients, in group-I overgrowth is more but in hip spica shortening is more with very highly significant p value. The following table is given below in detail:

Table 3: Limb Length Discrepancy.

Limb Length Discrepancy	Group-I (n=36)		Group-II (n=36)		P value
	No.	%	No.	%	
OG	18	50	04	11.11	0.0001 ^{hs}
SD	03	8.33	21	58.33	
Total	36	100.0	36	100.0	

- Statistical analysis was done by Chi-square test.
- Group-I = TENS
- Group-II = Hip Spica.
- OG = Overgrowth
- SD = Shortening Discrepancy
- hs= highly significant.
- n= number of patients in each group

In table-4 shows malalignment distribution of the patients where statistically non-significant difference found. The following table is given below in detail:

Table 4: Malalignment (n=36).

Malalignment	Group-I (n=36)		Group-II (n=36)		P value
	No.	%	No.	%	
Varus Valgus	04	11.11	09	25	0.670 ^{ns}
Ant Post	02	5.55	07	19.44	
Total	06	16.66	16	44.44	

- Statistical analysis was done by Chi-square test.
- Group-I = TENS.
- Group-II = Hip Spica.
- s= significant.
- n= number of patients in each group.

In table-5 shows complication of the patients where in both group minor complication is more frequently found with significant p value. The following table is given below in detail:

Table 5: Complications (n=36).

Complications	Group-I (n=36)		Group-II (n=36)		P value
	No.	%	No.	%	
No	26	72.22	16	44.44	0.04 ^s
minor	10	27.77	19	52.77	
major	0	0	01	2.77	
Total	36	100.0	36	100.0	

- Statistical analysis was done by Chi-square test.
- Group-I = TENS.
- Group-II = Hip Spica
- s = significant.
- n= number of patients in each group

DISCUSSION

In group-I, 35 (95%) had no pain, and 01 (2.77%) had pain due to delayed union. In group-II, 28 (77.77%) were No, and 06 (16.66%) were Yes.

Out of 72, in group-I, 18 (50%) were OG, 03 (8.33%) were SD and group-II 04 (11.11%) were OG, 21 (58.33%) were SD of children who had Limb Length Discrepancy. So the P-value would be ($< 0.0001^5$). This result corresponds with those of the other study where in group-I (60%) overgrowth and (6.7%) shortening was found; while in group-II (63.3%) shortening and (13.3%) overgrowth was discovered.^[5]

In this study of malalignment, in group-I, 04 (11.11%) were varus valgus, 02 (5.55%) were Ant post. In group-II, 09 (25%) were varus valgus, 07 (19.44%) were ant post. So, the P-value would be (.67^{ns}). In another study in group-I, 08 (13.3%) were varus valgus, 04 (6.7%) were Ant post. In group-II, 16 (26.6%) were varus valgus, 12 (20%) were ant post.^[6]

Regarding complication in group-I, 26 (72.22%) had no complication, 10 (27.77%) were minor. Pain or irritation in nail entry site is the most common 5 in number, three (3) had superficial wound infection, and bursa formation 1, no major complication occur. In group-II, 16 (44.44%) had no complication, 19 (52.77%) were minor, 01 (2.77%) were major. In minor complication, knee stiffness and muscle wasting are found frequently, recovery patient from these is a bit difficult for both patient and parents. Pressure ulcer also present less frequently, but broken or loosen spica is a matter of concern for maintenance of reduction. P-value result in my study is (.04^s). On the other hand, in one report studied the most common complication which was pain at nail entry site (60%). 5.71% had local inflammatory reaction due to nails. Superficial infection occurred in 2.85%.^[7]

CONCLUSION

From our study we can conclude that, majority of the patients were male, also pain other complication cases were found to be minor. Further study is needed for better outcome.

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