

Closed Intramedullary Elastic Nailing in Femur Shaft Fractures in Children with Age 5 to 15 Years

Abdul Moez, Shoaib Umar, Erum Sultan and Shahid Riaz

ABSTRACT

Objective: To determine the efficacy of closed intramedullary elastic nailing in femur shaft fractures in children with age 5 to 15 years.

Study Design: Descriptive cases series study.

Place and Duration of Study: This study was conducted at the Department of Orthopaedics, Sheikh Zayed Hospital, Rahim Yar Khan from 01-01-2016 to 31-12-2016.

Materials and Methods: there were total 50 cases of both genders with age range of 5 to 15 years with femur shaft fracture of simple type. These cases underwent intramedullary nailing of titanium material and were then followed at 1,2 and after 3 months. The efficacy was labelled as yes when there was complete union over x ray and the angulation was not more than 15 degrees.

Results: In this study there were total 50 cases out of which 32 (64%) were males and 18 (36%) females with mean age of 9.57 ± 2.13 years. Mean duration of fracture was 3.87 ± 1.18 days. The efficacy of intramedullary nailing was seen in 45 (90%) of cases. The efficacy was slightly better in younger age group of 5 to 10 years, where the successful reunion was observed in 30 (93.75%) out of 32 cases with $p = 0.17$. Efficacy was also better where the cases presented within 3 days of fracture where it was seen in 23 (95.83%) out of 24 cases with $p = 0.09$.

Conclusion: The efficacy of intramedullary nailing in femur shaft fracture is good as every 9 out of 10 cases reveal it. The cases that report within 3 days have almost significant association with this.

Key Words: Femur shaft fracture, intramedullary nailing, efficacy, union

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INTRODUCTION

Children and young population often come across the accidents and among them the femoral shaft fractures is very common. It can be caused by various modes of trauma and the blunt trauma is the most common etiology. More than two third cases of femur fracture suffer the shaft fracture. The incidence in USA comprises almost 20 cases per 100,000 traumas in children.¹

X rays of the bone are the main diagnostic tools and after that both the surgical and non-surgical modalities have been tried in the past regarding this context to repair the fracture and healing of the injured bones. The guideline in young children to manage such cases are not well devised and always under controversy. Local recommendations are made to deal with such situation for which decisions are individually tailored.

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In the very young age groups Spica casts and closed reduction are the mainstay of the treatment but this intervention can result in other complication like shortening of length and malunion in intermediate teen age group. On the other hand the traditional procedures like traction for 2-3 weeks prior to the application of the cast can help decrease the above mentioned complication but the long term immobility slows the healing process and adds to complications rates.²

Therefore, various operative strategies have been used with the aim of avoiding the adverse physical, social, psychological, and financial consequences associated with prolonged immobilization.³ Those methods include flexible intramedullary and antegrade solid nails, external fixation, plates and screws. Each procedure carries the risk of certain complications, particularly pin track infection and re-fracture after external fixation removal or osteonecrosis after fixation with a solid antegrade intramedullary nail (IMN). Intramedullary elastic nails are under extensive discussion. But their success is different globally ranging from 82% to 97%.⁵⁻⁶

MATERIALS AND METHODS

This descriptive cases series study was conducted at the Department of Orthopaedics, Sheikh Zayed Hospital, Rahim Yar Khan from 01-01-2016 to 31-12-2016.

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In this descriptive cases series study there were total 50 cases enrolled of femur shaft fracture of simple type. Detailed socio-demographic data was collected and other clinical information like type and duration of fracture was also noted. Then these cases underwent intramedullary nailing of titanium material with required appropriate size according to the age and height of the cases. The cases were then followed and assessed at 1,2 and after 3 months after the intervention, where final outcome was seen and then the efficacy was labelled as yes when there was complete union over x ray done in PA and lateral views and the angulation was not more than 15 degrees.

Inclusion criteria:

1. Both genders
2. Age 5 to 15 years
3. Cases of femur shaft fracture of simple type (assessed on X rays) presenting within one week of the injury.

Exclusion Criteria:

1. Cases with open surgical wounds and compound fractures
2. Documented cases of fracture secondary to metabolic cause.
3. Cases with end stage liver, renal or cardiac disease.

Statistical analysis; The data was entered and analysed by using SPSS-21. Quantitative variables were presented as mean \pm SD (standard deviation) and qualitative variables as frequencies and percentages. Stratification was done to deal with effect modifier. Post stratification chi-square test was applied and $p \leq 0.05$ was taken as significant.

RESULTS

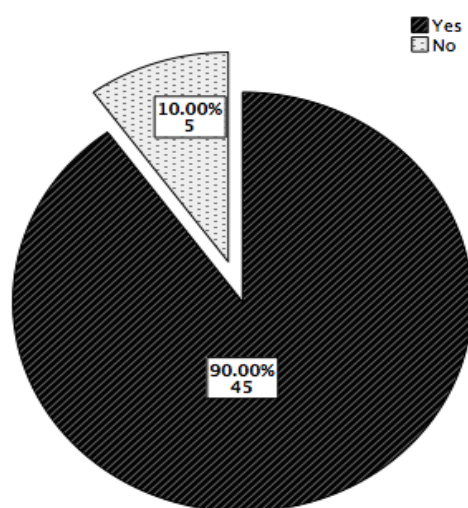


Figure No.1: Efficacy of intramedullary y nailing n= 50

In this study there were total 50 cases out of which 32 (64%) were males and 18 (36%) females with mean age of 9.57 ± 2.13 years. Mean duration of fracture was

3.87 ± 1.18 days. The efficacy of intramedullary nailing was seen in 45 (90%) of cases as in figure 01. There was no significant difference in terms of efficacy between both genders with $p = 0.84$ (table 1). The efficacy was slightly better in younger age group of 5 to 10 years, where the successful reunion was observed in 30 (93.75%) out of 32 cases with $p = 0.17$ (table 2). Efficacy was also better where the cases presented within 3 days of fracture where it was seen in 23 (95.83%) out of 24 cases as compared to 22 (84.61%) out of 26 cases presenting later than this with $p = 0.09$ (table 3).

Table No.1: Efficacy of intramedullary nailing with respect to gender n= 50

| Gender | Efficacy | | Total |
|--------|-------------|------------|-----------|
| | Yes | No | |
| Male | 29 (90.63%) | 3 (9.37%) | 32 (100%) |
| Female | 16 (88.89%) | 2 (11.11%) | 18 (100%) |
| Total | 45 (90%) | 5 (10%) | 50 (100%) |

$p = 0.84$

Table No. 2: Efficacy of intramedullary nailing with respect to age groups n= 50

| Age groups (years) | Efficacy | | Total |
|--------------------|-------------|------------|-----------|
| | Yes | No | |
| 5-10 | 30 (93.75%) | 2 (6.25%) | 32 (100%) |
| 11-15 | 15 (83.33%) | 3 (16.67%) | 18 (100%) |
| Total | 45 (90%) | 5 (10%) | 50 (100%) |

$P = 0.17$

Table No. 3: Efficacy of intramedullary nailing with respect to duration of presentation n= 50

| Duration of presentation | Efficacy | | Total |
|--------------------------|-------------|------------|-----------|
| | Yes | No | |
| 1-3 days | 23 (95.83%) | 1 (4.17%) | 24 (100%) |
| 4-7 days | 22 (84.61%) | 4 (15.39%) | 26 (100%) |
| Total | 45 (90%) | 5 (10%) | 50 (100%) |

$P = 0.09$

DISCUSSION

The efficacy of intramedullary nailing in cases with femur shaft fracture in the present study was seen in 45 (90%) of cases. A study was conducted by Lohiya et al revealed that out of their 73 cases, 83% had fracture union and the rest of the 17% cases had either non-union or the degree of angulation was more than 15 degrees, which they labelled as malunion and

considered the re surgery in such cases.⁷ Another study carried out by Sela et al on 212 patients demonstrated the solid union in all the 100 % of their cases but in their study 10 (4.72%) cases had a malunion i.e. more than 15 degrees of angulation and needed re intervention.⁸ The results of our study were almost similar to the previous ones with slightly lower rate, which can be explained by the poor socioeconomic status of the country in contrast to those countries that are developed. Poor nutrition can delay and hinder in the process of healing.

The efficacy rate in the form of re union was also better where the cases presented within 3 days where it was seen in 23 (95.83%) out of 24 cases as compared to 22 (84.61%) out of 26 cases with $p = 0.09$. Why is the success rate better in cases that reported early? This can be due to the reason that the cases that report early had better chance to manipulate and led to good result. Contrary to this, the cases that reported later, they were either complicated or their malunion could have occurred or they had open wound or secondary infection at wound sites; hence union in such cases was slightly lower which was also observed by the other studies that also found good results in early reporting.⁹⁻¹¹

CONCLUSION

The efficacy of intramedullary nailing in femur shaft fracture is good as every 9 out of 10 cases reveal it. The cases that report within 3 days have almost significant association with this.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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