Management o Paediatric Femoral Shaft Fracture: Functional Outcome of Elastic Nailing

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ABSTRACT

Objective: To assess the functional outcome of pediatric femoral shaft fracture treated with Elastic nail using flynn's criteria.

Methods: This descriptive study was conducted on twenty children with femoral shaft fractures treated with Titanium elastic nail from January 2013 to December 2014. The mean age was 10.25 years and the mean follow up period was 12 months.

Results: In a mean time of 7.5 weeks, all patients get united. There were 17 (85%) Excellent, 2 (10%) satisfactory and 1 (5%) poor result.

Conclusion: Titanium elastic nailing is safe and effective method of treating femoral shaft fracture in paediatric age group. It is less invasive with fewer complications.

Key words: Paediatric Femoral Shaft Fractures, Elastic Nails

INTRODUCTION

The femoral shaft fractures are the most common paediatric injuries. It occurs in 1.6% of children, incidence is 20 per 100,000/year[1]. More common in boys with an interesting bimodal distribution at toddlers and adolescents.

Multiple treatment options availaible from casting , thomas splinting , traction to plating and nailing for femoral shaft fractures in children. It depends on age of the patient and fracture geometry.

During the last ten years, operative modalities are preferred over conservative management especially in school going children due to early return to activities[2]. Titanium elastic nails (Fig 1) have gain the popularity over other surgical modalities like plate and screw fixation in treating diaphyseal femoral shaft fractures of paedriatic age group[7,8].

Our study is to assess the functional outcome of titanium elastic nailing in femoral shaft fractures of children using Flynn's criteria[9].

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Figure 1: Elastic titanium nail

METHODS

This study was conducted from January 2013 to December 2014. Flynn's criteria was used to assess the outcome of titanium elastic nailing in the treatment of paedriatic femoral shaft fractures. All patients have closed femoral shaft fractures, AO classification 3.2A, with no associated injuries. Their age range from 5-15 years. Open fractures, weight over 49kg and metabolic bone disease were excluded. There were twenty patients. Fifteen (75%) were boys and five (25%) were girls as shown in Table I.

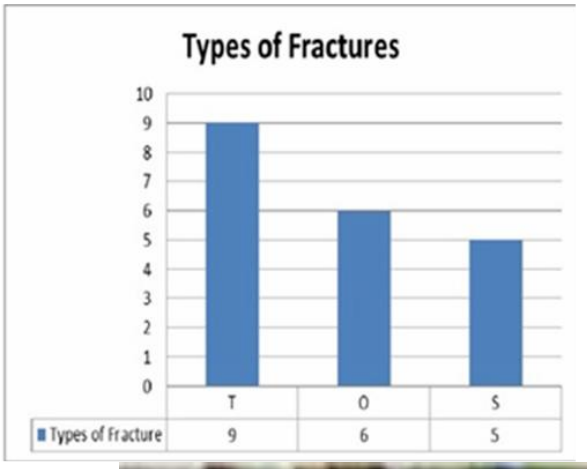
Table I:

Gender			Frequency	Percentage
Male		M	15	75%
Female		F	5	25%
	Ratio	3:1		

The mechanism of injury were Road traffic accident in 12 (60%) patients, fall from height in 6 (30%) and assault in 2 (10%) patients as shown in Table II.

Table II:

Mechanism of Injury	Frequency	Percentage
Road Traffic Accident	12	60%
Fall from Height	6	30%
Assault	2	10%



The fracture was transverse in 9 (45%), oblique in 6 (30%) and spiral in 5 (25%) patients as shown in following Graph.

(T: transverse, O: oblique. S: spiral)

All patients were operated under General anaesthesia in supine position. Fracture reduced under image control. Two Titanium Elastic nail introduced into the medullary cavity in retrograde fashion, thru entry made on lateral and medial aspect of metaphyseal region of distal femur respectively. First generation cephalosporin given for 48 hours. Postopereatively. Patients discharge on third postoperative day.

Range of motion Exercises started on the next postoperative day (Fig 2).

Full weight bearing was started gradually on 3rd week onwards according to radiological findings of callus formation (fig 3).

Figure 2: Range of motion excercises 1st POD

Figure 3: Radiograph showing TEN

The patients were followed on 1st week for surgical wound inspection and then at 2nd week for stiches removal. At 3rd week for radiological assessment then every third week till 12 weeks for radiological evidence of union and finally at 24 weeks. During followups patients were evaluated by flynn's scoring (Table III). Data analysis was done by using SPSS 20. The mean follow up was 12 months.

Table III: Flynn's criteria

Flynn's criteria			
	Poor	**Satisfactory**	**Excellent**
Limb Length Discrepancy	>2.00cm	1.00–2.00cm	< 1.00 cm
Misalignment	> 10	5-10	< 5

RESULTS

Radiological union was achieved in all patients in a mean time of 7.5 weeks. Full weight bearing wa s allowed after 8 weeks.

All patients were clinically evaluated on Flynn's criteria as shown in Table IV and pie chart(Fig 4).

Table IV: Flynn's Criteria (Radiology & Clinical) Analysis

	Frequency	Percentage
Excellent	17	85%
Statisfactory	2	10%
Poor	1	5%

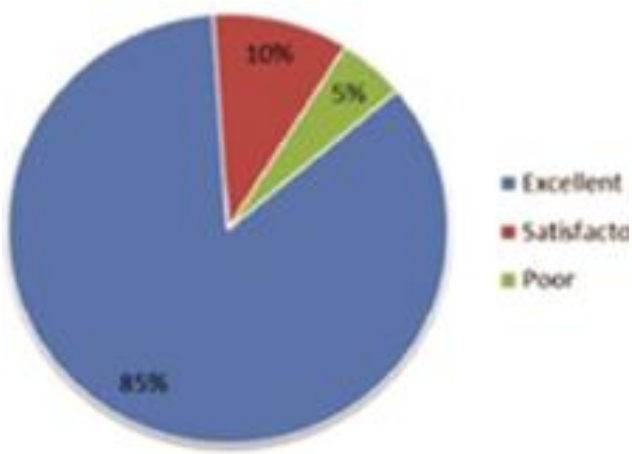


Fig 4: Flynn's Criteria (Radiology & Clinical) Analysis

The results were excellent in 17 (85%), satisfactory in 2 (10%) and poor in 1 (5%).

The nail were caused irritation at the site of entry in 3 children due to subcutaneous protrusion . there were no postoperative infection, physeal injury and failure of implant noted.

DISCUSSION

Femoral shaft fracture in paedriatic age group has been managed both operatively and non operatively. conservative managament associated with malunions, plaster complications and low compliance due to prolonged immobilisation. Operative management has gained popularity in the last two decades.

The ideal device for the diaphyseal femoral fracture in children should be simple, load sharing and provides internal splintage. Therefore early mobilisation is allows, while the alignment and limb length has maintained till the bridging callus has forms[9,10]. The titanium elastic nails due to its improved material provides inherent stiffness and adequate strength and due to its flexibility provides ease of introduction into the medullary canal [11, 12]. It hastens fracture union, reduces malreduction, shortening and allow immediate postoperative rehabilitation. The hospital stay is reduce and early return to function [13, 14].

Titanium elastic nails are effective treatment modality for paedriatic femoral shaft fractures.

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