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A study on occurrence of paediatric diaphyseal fractures of femur in Indian population

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Abstract

Background: There was an increased interest in the operative treatment of paediatric fractures in the past two decades, although debate persisted over its indications. There is a little disagreement concerning the treatment of femur fractures in children less than 5 years (POP cast) and adolescents older than 15 years (locked intramedullary nailing). Controversy persists regarding the age between 5 to 15 years. Several treatment options for femoral shaft fractures in children and adolescents have been described. Children below the age of 3 can be treated with a cast or extensional devices. In the past two decades, the management of displaced femoral shaft fractures in older children has gradually evolved toward a more operative approach due to a more rapid recovery, faster reintegration of the patients and possible negative effects of immobilization even in children. Orthopaedic surgeons will continue to face the challenge to treat this age group with less morbidity at a lower cost, as no clear guidelines have been available until now despite efforts done initially by French surgeons, later on by European surgeons and recently by the Paediatric Orthopaedic Society of North America (POSNA).

Conclusion: There was no significant association observed between clinical variables (age, gender, mode of injury, pattern of fracture and time interval between trauma and surgery) and incidence of complications.

Keywords: Paediatric diaphyseal fractures of femur, TENS

Introduction

There was an increased interest in the operative treatment of paediatric fractures in the past two decades, although debate persisted over its indications. There is a little disagreement concerning the treatment of femur fractures in children less than 5 years (POP cast) and adolescents older than 15 years (locked intramedullary nailing) [1]. Controversy persists regarding the age between 5 to 15 years. Several treatment options for femoral shaft fractures in children and adolescents have been described. Children below the age of 3 can be treated with a cast or extensional devices. In the past two decades, the management of displaced femoral shaft fractures in older children has gradually evolved toward a more operative approach due to a more rapid recovery, faster reintegration of the patients and possible negative effects of immobilization even in children [2]. Orthopaedic surgeons will continue to face the challenge of treating this age group with less morbidity at a lower cost, as no clear guidelines have been available until now despite efforts done initially by French surgeons, later on by European surgeons and recently by the Paediatric Orthopaedic Society of North America (POSNA) [3].

Titanium elastic nail (TEN) fixation was originally meant as an ideal treatment method for femoral fractures as it represents a compromise between conservative and surgical therapeutic approaches with satisfactory results and minimal complications [3].

Aim and objective of the study: To study the various aspects of managing diaphyseal fractures of the femur in children aged between 5-15 years by using Titanium Elastic Nailing System regarding Age, Gender, mode of injury, the side affected, the pattern of fracture, level of fracture, the time interval between trauma surgery.

Material and Methods: All children and adolescent patients between 5-15 years of age with

diaphyseal fractures of femur admitted at Mamata General Hospital, Khammam, meeting the inclusion and the exclusion criteria during the study period from October 2018 to September 2020 were the subjects for the study.

Patients

Inclusion criteria

Children and adolescents between the age of 5 to 15 years having

The following type of diaphyseal fractures of the femur:

1. Fresh closed displaced/ un displaced diaphyseal fractures.
2. Fresh Type I and Type II open fractures.
3. Closed comminuted fractures.
4. Segmental fractures.

Exclusion criteria

1. All open fractures having secondary infections or suspected deep infections or late presentations (>10 days)
2. All type III open fractures
3. Closed fractures more than two weeks old
4. All metaphyseal fractures with/ without the involvement of epiphysis
5. All pathological fractures

As soon as the patient was brought to casualty, the patient’s airway, breathing and circulation were assessed. Following this, a complete survey was carried out to rule out any other significant injuries. Plain radiographs of AP and lateral views of the involved extremity, including one joint above and one joint below, were taken to assess the extent and geometry of the fracture.

Collection of data from children admitted with diaphyseal fractures of the femur was the history (relating to the age, sex, and occupation, mode of injury, time of injury and place of injury, past and associated present medical illnesses) taken by verbal communication from the child and/ or parents/ guardians.

Observations and Results

Results of the present study: An outcome surgical study of 20 patients with Diaphyseal fractures of the femur was undertaken to study the outcome of Titanium elastic nail fixation for femur fractures in children and adolescents aged 5-15 years.

Table 1: Age-wise distribution of patients)

Age In years	Number of patients	Percentage (%)
5-8	9	45.0
9-12	7	35.0
13-15	4	20.0
Total	20	100.0

Table 2: Gender wise distribution of patients

Gender	Number of patients	Percentage (%)
Male	17	85.0
Female	3	15.0
Total	20	100.0

Table 3: Distribution of patients according to the mode of Injury

Mode of Injury	Number of patients	Percentage (%)
RTA	10	50.0
Fat due to stumbling	7	35.0
Fat from height	3	15.0
Total	20	100.0

Table 4: Distribution of patients based on the side affected

Side affected	Number of patients	Percentage (%)
Right	10	50.0
Left	10	50.0
Total	20	100.0

Table 5: Distribution of patients based on the pattern of fracture

Pattern of fracture	Number of patients	Percentage (%)
Transverse	9	45.0
Oblique	5	25.0
Spiral	4	20.0
Segmental	1	5.0
Comminuted	1	5.0
Total	20	100.0

Table 6: Distribution of patients based on level of fracture

Level of fracture	Number of patients	Percentage (%)
Proximal 1/3rd	10	50.0
Middle 1/3rd	8	40.0
Distal 1/3rd	2	10.0
Total	20	100.0

Table 7: Distribution of patients based on time interval between trauma and surgery

Time of interval between trauma & surgery	Number of patients	Percentage (%)
< 2days	10	50.0
3-4 days	7	35.0
5-7 days	1	5.0
>7 days	2	10.0
Total	20	100.0

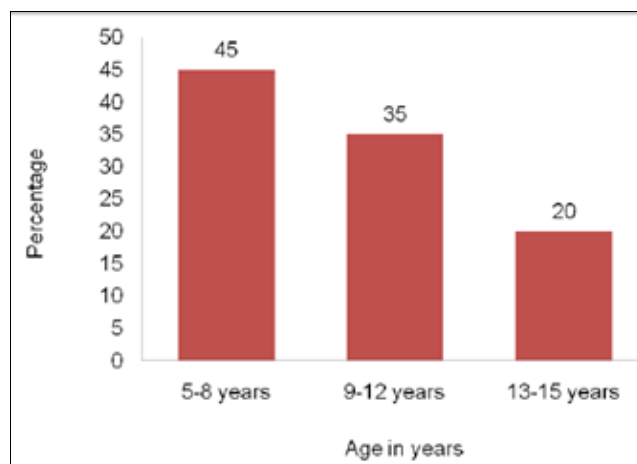


Fig 1: Age-wise distribution of patients

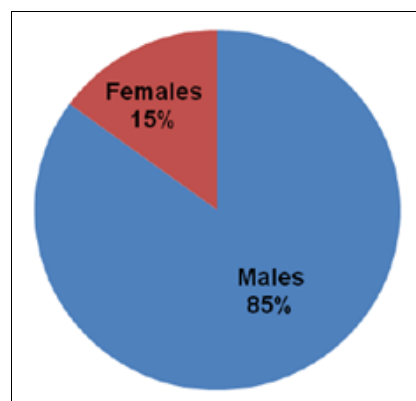


Fig 2: Gender wise distribution of patients

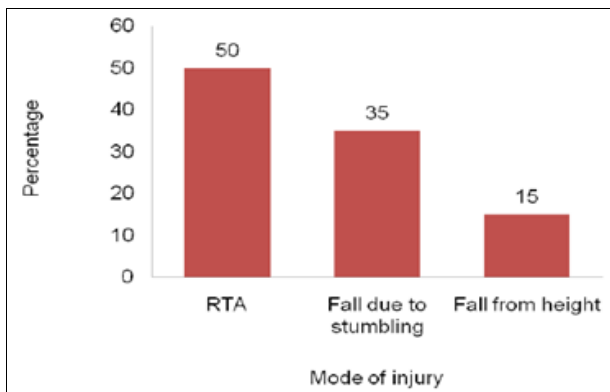


Fig 3: Distribution of patients according to 10 mode of Injury

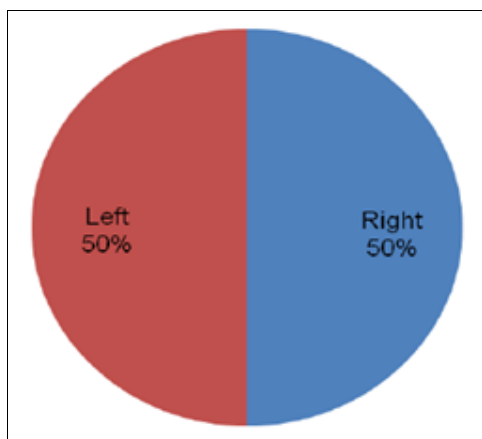


Fig 4: Distribution of patients based on the side affected

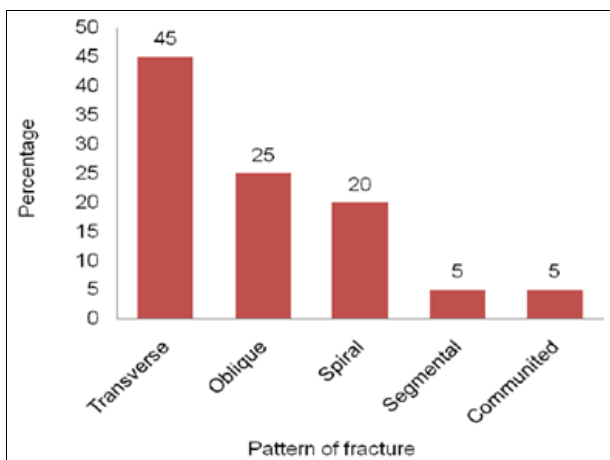


Fig 5: Distribution of patients based on pattern of fracture

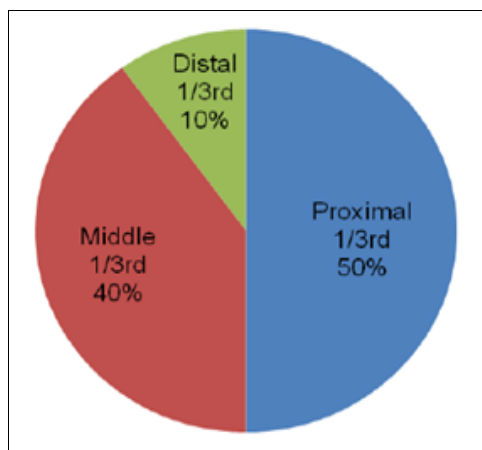


Fig 6: Distribution of patients based on level of fracture

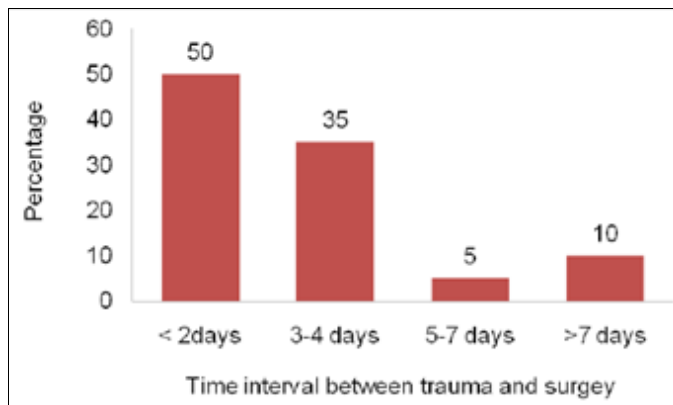


Fig 7: Distribution of patients based on the time interval between trauma end Surgery

Conclusion

There was no significant association observed between clinical variables (age, gender, mode of injury, pattern of fracture and time interval between trauma and surgery) and incidence of complications.

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