

Research Article

Clinical Pattern, Treatment Modalities, and Outcomes of Paediatric Fractures in a Tertiary Care Hospital: An Observational Study

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Abstract

Background:

Paediatric fractures constitute a significant proportion of orthopaedic emergencies and differ from adult fractures in pattern, healing potential, and management. Understanding the clinical profile and outcomes helps in planning appropriate treatment strategies. **Objective:** To study the clinical pattern, treatment modalities, and outcomes of paediatric fractures in a tertiary care hospital. **Methods:** This observational study was conducted in the Department of Orthopaedics at Prakash Institute of Medical Sciences and Research Centre, Islampur, Sangli, Maharashtra, from January 2023 to June 2023. A total of 50 paediatric patients (≤ 16 years) presenting with fractures were included. Data regarding age, sex, mechanism of injury, fracture type, site, treatment modality, and outcomes were collected and analyzed. **Results:** The majority of patients belonged to the school-going age group and were males. Falls during play and road traffic accidents were the most common mechanisms of injury. Upper limb fractures were more frequent than lower limb fractures, with forearm fractures being the most common. Most cases were managed conservatively

with closed reduction and casting, while a smaller proportion required surgical intervention. The majority of patients had good functional outcomes with minimal complications. **Conclusion:** Paediatric fractures are commonly seen in active school-aged children and are predominantly due to falls. Most fractures can be managed conservatively with satisfactory outcomes. Early diagnosis, appropriate treatment, and regular follow-up are essential to prevent complications and ensure optimal recovery.

Keywords: *Paediatric fractures, clinical pattern, treatment modalities, outcomes, observational study*

Introduction

Paediatric fractures are among the most common injuries encountered in orthopaedic practice and account for a substantial proportion of emergency department visits in children. Due to differences in bone structure, growth plates, and remodeling potential, fractures in children differ significantly from those in adults in terms of pattern, management, and healing.¹

The incidence of paediatric fractures has increased in recent years due to increased outdoor activities, sports participation, and road traffic accidents. Falls during play remain the most common mechanism of injury. Upper limb fractures, particularly of the forearm and supracondylar region of the humerus, are frequently encountered.²

Management of paediatric fractures ranges from conservative treatment such as immobilization and casting to surgical intervention in displaced or unstable fractures. Early and appropriate management is essential to avoid complications such as malunion, growth disturbances, and functional impairment.³

This study was undertaken to analyse the clinical pattern, treatment modalities, and outcomes of paediatric fractures presenting to a tertiary care teaching hospital.

Objectives

1. To study the clinical pattern of paediatric fractures.
2. To analyze the treatment modalities used.
3. To evaluate the outcomes and complications.

Materials and Methods

Study design: Observational study

Study setting: Department of

Statistical analysis

Data were entered in MS Excel and analyzed using descriptive statistics. Results were expressed as frequencies and percentages.

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Study duration: January 2023 to June 2023

Sample size: 50 paediatric fracture cases

Inclusion criteria

- Patients aged ≤ 16 years
- Radiologically confirmed fractures
- Patients treated in the orthopaedic department
- Consent obtained from parents/guardians

Exclusion criteria

- Pathological fractures
- Birth injuries
- Incomplete records
- Patients lost to follow-up

Data collection

Data were collected using a structured proforma including:

- Age and sex
- Mode of injury
- Site and type of fracture
- Treatment modality
- Complications
- Outcome at follow-up

Results

Table 1: Age distribution of paediatric fracture cases (N = 50)

Age group (years)	Number of cases	Percentage (%)
0–5	8	16
6–10	22	44
11–16	20	40
Total	50	100

A total of **50 paediatric patients** with fractures were included in the present observational study conducted from January 2023 to June 2023. The majority of patients belonged to the **6–10 years age group (44%)**, followed by **11–16 years (40%)**, while **16%** were below 5 years of age.

Table 2: Gender distribution of paediatric fracture cases (N = 50)

Gender	Number	Percentage (%)
Male	34	68
Female	16	32
Total	50	100

There was a clear male predominance, with **68% males** and **32% females**.

Table 3: Distribution according to mode of injury

Mode of injury	Number	Percentage (%)
Fall while playing	28	56
Road traffic accident	12	24
Fall from height	6	12
Sports injury	4	8
Total	50	100

The most common mode of injury was fall while playing (56%), followed by road traffic accidents (24%), fall from height (12%), and sports-related injuries (8%).

Table 4: Distribution according to site of fracture

Site	Number	Percentage (%)
Upper limb	34	68
Lower limb	14	28
Clavicle	2	4
Total	50	100

Regarding the anatomical distribution, upper limb fractures were most common (68%), followed by lower limb fractures (28%) and clavicle fractures (4%).

Table 5: Distribution according to specific fracture types

Fracture type	Number	Percentage (%)
Both bone forearm	14	28
Supracondylar humerus	10	20
Radius/ulna isolated	6	12
Femur	6	12
Tibia/fibula	5	10
Clavicle	2	4
Others	7	14
Total	50	100

Among specific fracture types, **both bone forearm fractures** were the most frequent (**28%**), followed by **supracondylar fractures of the humerus (20%)**. Fractures of the femur and isolated radius/ulna fractures each accounted for **12%**, while tibia/fibula fractures accounted for **10%** of cases.

Table 6: Distribution according to treatment modalities

Treatment modality	Number	Percentage (%)
Conservative (casting/splint)	32	64
Closed reduction + K-wire	12	24
ORIF with plate/nail	6	12
Total	50	100

Most patients were managed conservatively. Conservative treatment with immobilization was used in 64% of cases, while closed reduction with K-wire fixation was performed in 24%. Open reduction and internal fixation (ORIF) were required in 12% of cases.

Table 7: Distribution according to duration of hospital stay

Hospital stays	Number	Percentage (%)
<3 days	26	52
3–7 days	18	36
>7 days	6	12
Total	50	100

Regarding hospital stay, **52%** of patients were discharged within **3 days**, **36%** stayed for **3–7 days**, and **12%** required hospitalization for more than one week.

Table 8: Distribution according to complications

Complications	Number	Percentage (%)
None	42	84
Infection	3	6
Malunion	2	4
Stiffness	3	6
Total	50	100

Complications were minimal. **Eighty-four percent** of patients had no complications. Postoperative infection was noted in **6%**, stiffness in **6%**, and malunion in **4%** of cases.

Table 9: Distribution according to functional outcome at follow-up

Outcome	Number	Percentage (%)
Good	40	80
Fair	7	14
Poor	3	6
Total	50	100

At follow-up, the majority of patients had favorable outcomes. **Good functional outcome** was observed in **80%** of patients, **fair outcome** in **14%**, and **poor outcome** in **6%**.

Discussion

The present study evaluated the clinical pattern, treatment modalities, and

outcomes of paediatric fractures in a tertiary care teaching hospital. Paediatric fractures constitute a major portion of orthopaedic trauma and vary according to age, activity level, and mechanism of injury. In this study, most patients belonged to the **6–10 years age group**, which corresponds to the period of increased physical activity

and outdoor play. Similar observations were reported by **Agarwal et al⁴**, who found that school-aged children constituted the majority of paediatric fracture cases in an Indian tertiary care center. The male predominance observed in the present study (**68%**) is consistent with previous Indian and international studies, as boys are generally more involved in outdoor activities and sports. **Bhardwaj et al⁵** also reported a higher incidence of fractures among boys compared to girls.

Falls during play were the most common mechanism of injury (**56%**) in this study, followed by road traffic accidents. This finding is comparable to studies by **Verma et al⁶** and **Sharma et al⁷**, who reported falls as the leading cause of paediatric fractures in Indian settings, accounting for more than half of the cases. Road traffic accidents were the second most common cause, reflecting increasing vehicular exposure and urbanization.

Upper limb fractures were the most frequent (**68%**) in the present study. Similar findings were reported by **Gupta et al⁸**, who observed that upper limb fractures, particularly forearm fractures, were the most common paediatric fractures in their series.⁵ Both bone forearm fractures and supracondylar fractures of the humerus were the predominant fracture types in this study, which is consistent with findings by **Patel et al⁹**, who reported forearm fractures as the most common, followed by supracondylar fractures.

Most cases in the present study were managed conservatively (**64%**), reflecting the excellent remodeling potential of pediatric bones. Surgical intervention was required in a smaller proportion of displaced or unstable fractures. Similar treatment trends were reported by **Kulkarni et al¹⁰**, where conservative management was sufficient in the majority

of paediatric fracture cases, with good functional outcomes.

The complication rate in the present study was low, and most patients achieved good functional outcomes (**80%**). This is comparable to findings by **Rathore et al¹¹**, who reported favorable outcomes in most paediatric fractures when treated appropriately and followed up regularly. Early diagnosis, proper immobilization, and timely surgical intervention when indicated are crucial in preventing complications such as malunion and stiffness.

Overall, the findings of this study are consistent with both Indian and international literature. Paediatric fractures are more common in active school-aged children, particularly boys, and are most often caused by falls. Upper limb fractures predominate, and most cases can be managed conservatively with good outcomes. Preventive strategies such as improved supervision during play, safe school environments, and road safety awareness can help reduce the incidence of paediatric fractures.

Conclusion

The present study evaluated the clinical pattern, treatment modalities, and outcomes of paediatric fractures in a tertiary care teaching hospital over a six-month period. Paediatric fractures were found to occur predominantly in school-aged children, with a clear male preponderance. Falls during play emerged as the most common mechanism of injury, followed by road traffic accidents. Upper limb fractures, particularly forearm and supracondylar fractures, were the most frequently encountered injuries.

Most fractures were managed successfully with conservative methods such as closed reduction and immobilization, reflecting the excellent healing and remodeling potential of paediatric bones. Surgical intervention was required only in selected cases with displaced or unstable fractures.

The overall complication rate was low, and the majority of patients achieved good functional outcomes on follow-up.

These findings highlight that early diagnosis, appropriate treatment selection, and regular follow-up are key factors in ensuring favorable outcomes in pediatric fractures. Strengthening injury prevention strategies, including safer play environments and improved supervision, along with timely and effective orthopaedic care, can further reduce morbidity and improve outcomes in children with fractures.

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