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Dr. Kundan Kushwah
Associate Professor,
Dept. of Orthopaedics, MGM
Medical College & M.Y. Hospital,
Indore, Madhya Pradesh, India

Dr. Rajeev Kelkar
Associate Professor,
Dept. of Orthopaedics, MGM
Medical College & M.Y. Hospital,
Indore, Madhya Pradesh, India

Dr. Rohit Kumar Mujalde
PG Resident, Dept. of
Orthopaedics, MGM Medical
College & M.Y. Hospital, Indore,
Madhya Pradesh, India

To compare the functional outcome between operative and conservative management of displaced radius ulna diaphyseal fracture in children

Dr. Kundan Kushwah, Dr. Rajeev Kelkar and Dr. Rohit Kumar Mujalde

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Abstract

The aim of this Prospective study is to compare the functional outcome between operative and conservative management of displaced radius ulna diaphyseal fracture in children.

Study being done at: Department of Orthopaedics and Traumatology MGM MC & M.Y.H Indore

In our study to compare the functional outcome between conservative and surgical management of displaced radius ulna diaphyseal fracture in children.

Total No. of patient 30 out of which 15 patients treated with conservative closed reduction above elbow cast.

15 patients treated with closed reduction and TENS nail.

In conservative manage patient grace and iversman score is Excellent in 7 patients Good in 4 patients Acceptable in 3 patients Unacceptable in 1 patient.

Complication: mal union in 1 patient elbow joint stiffness in 3 patients

15 patients treated with closed reduction and TENS nail Grace and iversman score is Excellent in 10 patients Good in 3 patients Acceptable in 2 patients.

Complication: infection at nail entry point in 1 patient elbow joint stiffness in 2 patients.

In our study Said that Operative management is better than conservative management.

Keywords: Operative, conservative, radius, ulna fracture & diaphyseal

Introduction

Diaphyseal fractures of the radius and ulna Pediatric, usually known as both bone forearm fractures, are the third most common fracture in the pediatric population & account for 13-40% of all pediatric fractures [1].

Traditionally, the majority of these fractures have been treated with non-operative management relying on closed reduction and casting [2].

Recently, however, there has been a trend towards increased surgical management of these fractures in an effort to improve clinical outcomes.

The management of these fractures depends on the age, type of fracture and fracture displacement.

Given a child's physeal growth potential, varying degrees of angulation can be accepted depending on the age of the child and their ability to remodel.

Long arm cast immobilization remains a viable treatment option for many of these fractures that fall within acceptable alignment parameters, and children are generally at low risk for developing significant elbow stiffness following cast immobilization.

For fracture patterns, which are unable to be closed reduced to an acceptable position, surgical management is recommended.

Surgical treatment options include both rigid plate fixation and elastic intramedullary nails. Recently there has been an increased interest in determining which method provides superior results, but the optimal treatment remains controversial.

The aim of this study is to review on treatment of paediatric both bone forearm fractures in younger children (ages 5-12), and offer useful treatment algorithms for these injuries.

However, many of the studies in the literature on this topic are retrospective in design and are limited in the number of patients they contain [3].

Corresponding Author
Dr. Rajeev Kelkar
Associate Professor,
Dept. of Orthopaedics, MGM
Medical College & M.Y. Hospital,
Indore, Madhya Pradesh, India

Incidence rate in paediatric population is 40%.
 Male to female ratio is 3:1.
 Occurrence in distal metaphysis – 60%
 Shaft 20%
 Distal 14%
 Proximal third- < 4%

Inclusion criteria

Age between 5 year to 12 year
 Simple fracture
 Fresh fracture <1 week fractures
 Isolated forearm displaced fracture

Exclusion criteria

Compound fracture
 Complicated fracture (associated neurovascular compromise)
 Pathological fracture
 Age <5 & >12
 Fracture, >1week
 Other fracture in ipsilateral limb
 Patient refusal for inclusion

Materials & Methods

The aim of this Prospective study is to compare the functional outcome between operative and conservative management of displaced radius ulna diaphyseal fracture in children
 Study being done at: Department of Orthopaedics and Traumatology, M.G.M.M.C. M.Y.H., Indore for 2 years, from Sept 2017 to Sept 2019. Sample size 30 (15 each group).

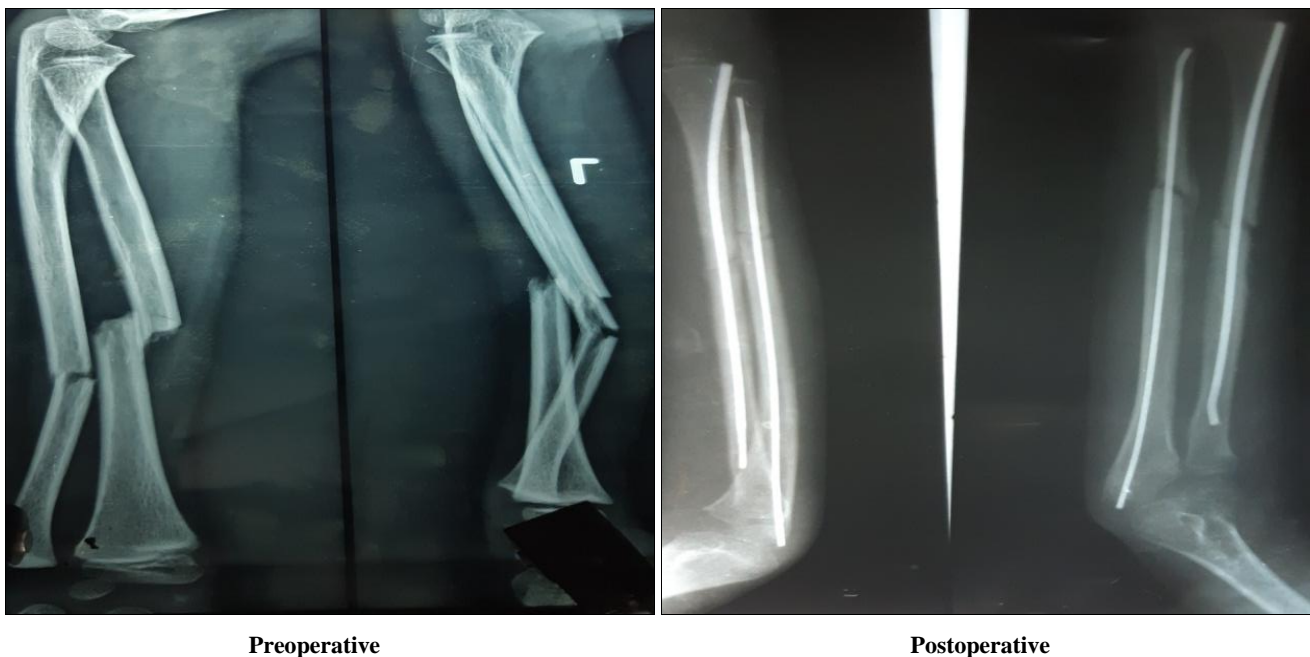


Fig 1: Patient presented with h/o fall on ground on

Results

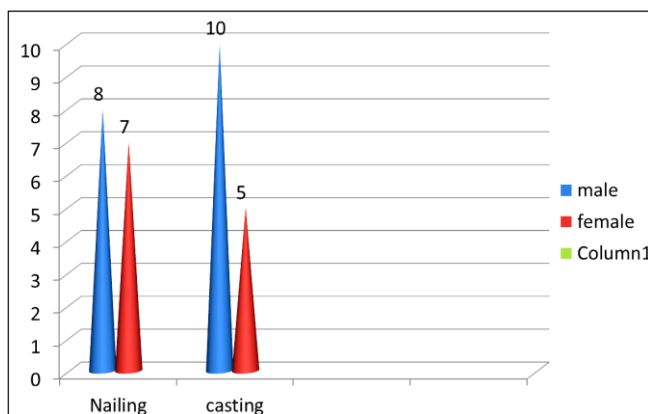


Fig 2: Graph No.1 Sex distribution

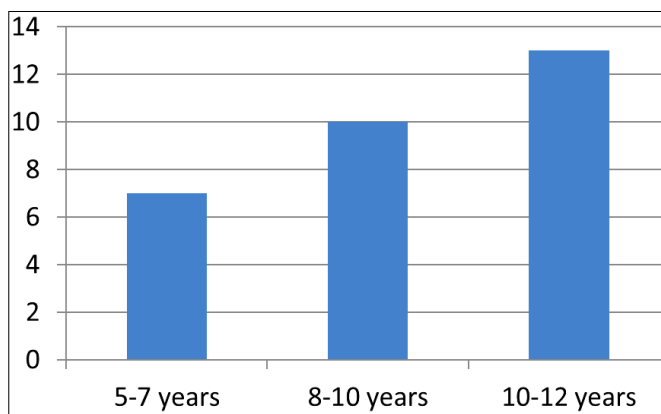


Fig 3: Graph No.2 Age distribution

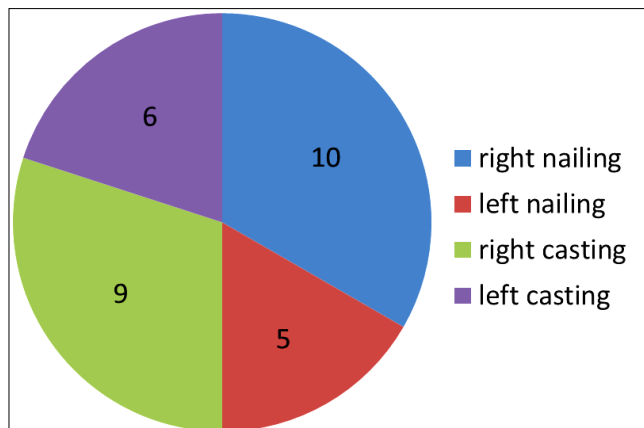


Fig 4: Graph No. 3 Laterality

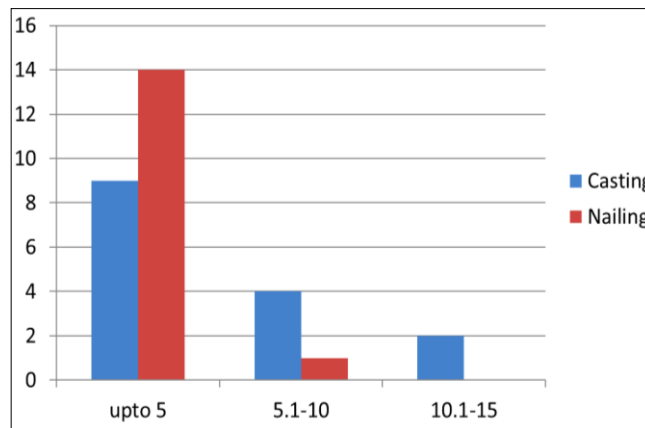


Fig 8: Graph No.7 Dash score

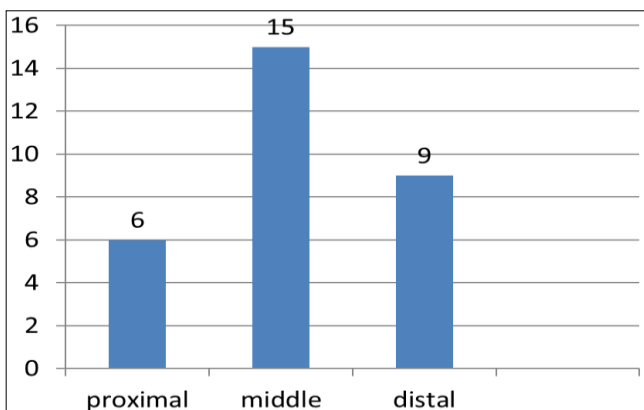


Fig 5: Graph No. 4 Fracture pattern

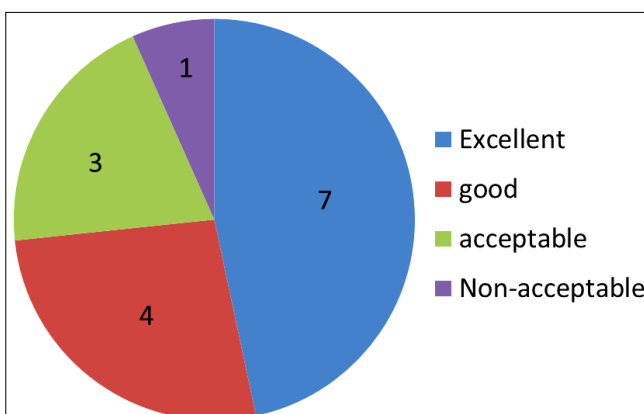


Fig 6: Graph No. 5 Grace & Iversman score of conservative management

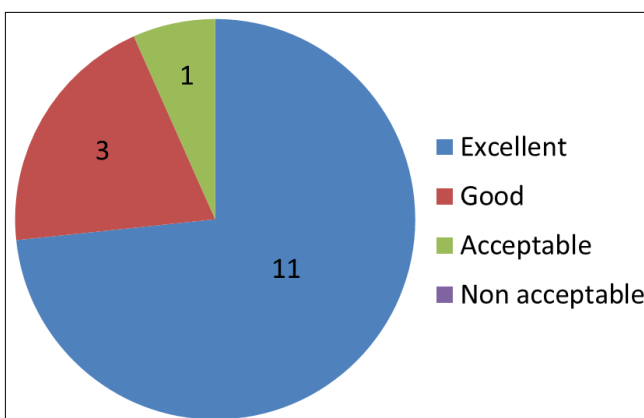


Fig 7: Graph No.6 Grace & Iversman score of operative management

Table 1: Complications

Conservative	Operative
Malunion -2	Infection -1
Elbow joint stiffness -2	Elbow joint stiffness -1

Discussion

Diaphyseal fracture of both bones of forearm in mature bone is now treated by open reduction and internal fixation. But it is not true for immature bones. Fractures of forearm in children and adolescent are extremely common [6]. Studies have demonstrated lower bone density or weaker bone structure in boys and girls with a distal forearm fracture compared with controls [7].

Recently there has been an increased interest in determining which method provides superior results, but the optimal treatment remains controversial.

Recently, intramedullary nailing has been gaining popularity due to decreased soft tissue dissection; however, a second operation is needed for hardware removal generally 6 months after the index procedure. Current literature has not established the superiority of one surgical method over the other.

Diaphyseal group of fractures is characterized by instability of bone fragments that are difficult for closed reposition and are characterized by a high risk of second- displacement of fragments with the use of only external fixation. Unresolved displacement of fragments, contraction of interosseous space, instability of bone fragments can cause slow consolidation with the possible formation of nonunion fractures, or false joints, with subsequent disruption of limb function (16). Diaphyseal localization of the fracture is a risk factor for delayed consolidation, because of the reduced intensity of bloodstream in this zone. The functionally stable intramedullary osteosynthesis, in our opinion, corresponds to these requirements-cosmeticity, lack of additional immobilization, early functional result. For a traumatologist, such important conditions as the speed of repositioning, the convenience of the rehabilitation period, and, most importantly, early activation, that allows to avoid contractures of joints and muscle hypotrophy. Osteosynthesis with TEN is shown in the older age group-from 10 to 17 years due to the possibility of delayed consolidation and, consequently, the necessary prolonged stable fixation of the damaged segment. Patient don't need to refuse to usual everyday loads, which is important not only functionally, but also psychologically.

In a study conducted by Vishal Mandlewala *et al.* 50 children were taken who were up till age of 12 years. In a similar study by Wahid Md. Et al the authors took 103 patients aged 2.5-13 years. Shalimar Abdullah took 48 patients up till the age of 12 years. Similar study conducted by Biswajit Sahu took 40 patients aged 5-15 years while another study conducted by Md. Ruhullah *et al.* took 79 patients aged up till 15 years and studied them for the comparison of conservative vs operative treatment modality for displaced diaphyseal both bone forearm fractures while Anto Antabek *et al.* studied 88 children aged up till 10.5 years and conducted only operative procedures. In the present study 30 patients were taken aged 5-12 years.

In a study conducted by Vishal Mandlewala *et al.* 90% of patients who had undergone conservative procedure had excellent results and 6.7% had good results while in the operative group 88.2 percent had excellent results and 66.69 percent had good results and he therefore concluded that conservative is better than operative modality. In a similar study by Wahid Md *et al.* [1] 78 patients underwent conservative modality and 25 underwent operative modality of treatment and he concluded that conservative is better than operative methods. Shalimar Abdullah *et al.* [1] conducted a study in which he managed forearm fractures in children with cast out of which he got 80% excellent and thus concluded conservative treatment to be a satisfactory form of treatment in children with steady type forearm fractures in children achieving excellent outcomes. In a study conducted by Biswajit Sahu *et al.* [1] conducted a study in patients with fracture of both radius and ulna who were managed by internal fixation with titanium elastic nail, in which, 87.5% of patients showed excellent, 10% showed good, and 2.5% showed fair outcome and concluded operative method to be better than conservative for these fractures. Md. Ruhullah *et al.* Managed both bone diaphyseal fractures with intramedullary flexible nailing and showed excellent results in 74 percent of the patients and came to the conclusion that flexible nailing leads to more versatile and efficient application of internal fixation for fracture shaft of both bone forearm, which permits early mobilization and return to the normal activities of the patients, with very low complication rate. In the present study, cast group had 60% acceptable and 20% good results while the operative group had 20% acceptable, 60% good and 20% excellent results and conclude that operative method is better than conservative method.

Conclusion

In our study to compare the functional outcome between conservative and surgical management of displaced radius ulna diaphyseal fracture in children. Total No. of patient 30 out of which 15 patients treated with closed reduction and above elbow cast 15 patients treated with closed reduction and TENS nail. In conservative manage patient grace n iversman score is Excellent in 7 patients Good in 4 patients Acceptable in 3 patients Unacceptable in 1 patient.

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