

FUNCTIONAL OUTCOME OF BOTH BONE FOREARM FRACTURES IN CHILDREN USING TENS NAILING ORTHOPEDICS

Orthopaedics

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ABSTRACT

Background: Pediatric diaphyseal forearm fractures are treated with closed reduction and an above elbow cast for a varying period of time, depending on the child's age. Because of unacceptable angular deformities, fracture instability, the presence of an open injury, or the failure of conservative management in the form of re-displacement in the cast following manipulation, some forearm diaphyseal fractures require osteosynthesis. The surgical procedure of choice for diaphyseal forearm fractures in children is an intramedullary fixation with titanium elastic nails. When there is cortical contact and a healthy soft tissue envelope, stabilisation offers internal elastic support according to the three-point fixing principle. **Objectives:** to examine the union rates, clinical results, and functional outcomes of both TENS-treated paediatric forearm diaphyseal fractures. **Conclusion-** We come to the conclusion that TENS nailing is a less invasive approach for fixing and uniting misplaced diaphyseal fractures in children while also offering stability and flexibility.

KEYWORDS

Both bone forearm fracture, diaphyseal fractures, TENS nail.

INTRODUCTION

Forearm bone fractures are more frequent in daily practice due to the younger generation's accelerated pace of life. Children's forearm diaphyseal fractures still provide a considerable surgical difficulty in their treatment. Options for treatment range from conservative to surgical techniques. Treatment of pediatric fractures dramatically changed in 1982, when Métaizeau and the team from Nancy, France, developed the technique of flexible stable intramedullary pinning (FSIMP) using titanium pins^{1,2}. In the last two decades there was an increased interest in the operative treatment of pediatric fractures, although debate persisted over its indications³. In children younger than 10 years. Perfect anatomic reduction is not necessary because remodeling may correct residual deformity.⁴ Different studies⁵⁻⁷ have shown that angulation of the forearm greater than 10° should be treated because remodeling is unpredictable. Many surgical management strategies have been described for the treatment of unstable forearm shaft fractures in children: plate fixation, external fixations, pins with plaster forearm fractures because of the good results and the fact that the method is easy to learn¹⁰. In addition, ESIN is a minimally invasive technique, the anatomic alignment is generally easy to reach and to stabilize until bony consolidation. It also provides easy and functional postoperative care modalities. This study aims to evaluate the outcomes of various forearm diaphyseal fracture treated with TENS nailing for children as well as the complications and failure factors.

METHODS:

In the period from November 2020 to September 2021, 30 children between the ages of 5 and 16 who were admitted to the Department of Orthopaedics at Al-Ameen Medical College and Hospital, Vijayapura, with diaphyseal fractures of the Radius and Ulna are chosen. The research includes all of the children who will be operated on throughout this time frame. The patients underwent clinical and radiological evaluations. An average of 6 months was spent following up with every patient.

Surgical Technique

The nailing procedure was performed under general anaesthesia with patient in a supine position and affected arm on a side table. A tourniquet was applied to the upper arm and was inflated only if an open reduction of the fracture was required. For the ulna, the stab incision was made on the proximal end of the forearm over the lateral surface of the olecranon 2 cm distal to physis under fluoroscopy. An awl was introduced to make an oblique entry hole in the ulna 2 cm distal to the olecranon physis. The nail was pre-bent at 10 degrees at the tip and was introduced in the oblique entry hole and gently negotiated

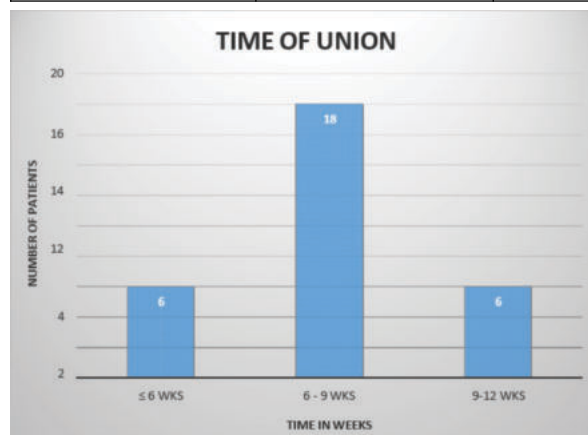
and pushed distally. Fluoroscopy was used during reduction. If required, the fracture site was exposed by a small incision, and reduction was accomplished. The bent tip of the pin aided in the reduction and the pin was pushed into the distal ulna, stopping short of the physis under the guidance of fluoroscopy. The pin was cut close to the bone, leaving enough end for easy removal later but without any tenting the skin. The skin was closed over the cut end. The skin over the incision made for exposing the fracture, if given, was closed too.

For the radius, a 2 cm long incision was made on the dorsal aspect of the distal end of the forearm over the radius medial to Lister's tubercle proximal to the radial physis under fluoroscopy. A blunt dissection was made to avoid the superficial branch of the radial nerve and extensor tendons. An oblique entry hole was similarly made over the dorsal aspect of the radius as in case of the ulna. The prebent nail was advanced through the fracture site as in the case of the ulna and was stopped short of the physis, at the level of bicipital tuberosity.

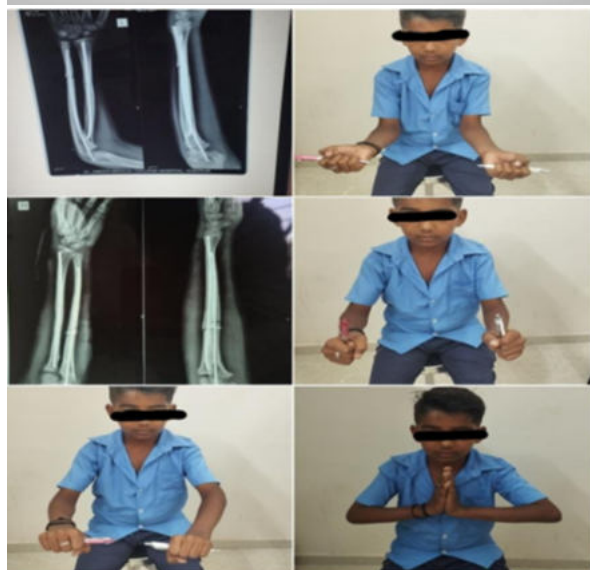
RESULTS

Table 11: Time Of Union

TIME OF UNION (IN WEEKS)	NUMBER OF PATIENTS	%
≤ 6	06	20
6-9	18	60
9-12	06	20
TOTAL	30	100



Graph 11: TIME OF UNION



Graph 13: Outcome At 24 Weeks

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DISCUSSION

Thirty patients with diaphyseal both bone forearm fractures were treated with titanium elastic nailing between NOVEMBER 2020 to SEPTEMBER 2021. The majority of children with forearm fractures were in the age group of 11-16 years constituting 60% of total patients with mean age of 11.9 years. The remaining patients (40%) were in the age group of 6-10 years. There were 24 male children with forearm fractures constituting 80% of total patients and six female children with forearm fractures constituting 20% of total patients in the present study. Fall on the outstretched hand was the most common mode of injury accounting for 80% (24 patients), and RTA accounted for 20% (6 patients) cases. Out of 30, 27 children (90%) were brought to the hospital on the first day itself and three other patients were brought to the hospital on 3rd day (10%). All the patients were prepared and operated as early as possible once the general condition was stable and the patient was fit for surgery. In our study, 20 children (66.66%) had fractures of the right forearm, and rest 10 (33.33%) had fractures.

CONCLUSION

We draw the conclusion that the ELASTIC STABLE INTRAMEDULLARLY NAILING approach is the best course of action for treating pediatric forearm both bone diaphyseal fractures. It provides elastic mobility that encourages quick union at the site of the fracture and stability that is perfect for early mobilization. When compared to other forms of treatment, it has a reduced rate of complications and produces positive results. It is a quick, uncomplicated, reliable, and efficient procedure for treating pediatric forearm diaphyseal fractures in children between the ages of 5 and 16. It requires less time in the operating room, less blood loss, less radiation exposure, a shorter hospital stay, and reasonable bone healing time. Early mobilization, quick healing, and little interference with bone formation make ESIN a physiological approach to treatment. A dependable, minimally intrusive, and physically-protective treatment option for children's forearm diaphyseal fractures is the use of ESINs.