

COMPARATIVE STUDY USING INTRAMEDULLARY K-WIRE FIXATION OVER TITANIUM ELASTIC NAIL IN PEDIATRIC BOTH BONE FOREARM FRACTURES

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INTRODUCTION

Forearm fractures are common pediatric injuries accounting for 45% of all fractures and 62% of all upper limb fractures. The goal of treatment of forearm and distal radius injuries is to facilitate union of the fracture in a position that restores functional range of motion to the elbow and forearm. Most of the pediatric both-bone forearm fractures can be managed conservatively. Un-displaced fractures can be safely treated in cast. Maintaining acceptable reduction is not always possible and re-displacement during cast treatment may occur in pediatric forearm fractures. Treatment alternatives of irreducible and unstable pediatric forearm fractures are closed re-manipulation under general anesthesia and casting, Kirchner wire and casting, closed or mini open reduction and intramedullary fixation, open reduction and internal fixation with plates.

In this study we compared between two intramedullary devices used in fixation of both-bones forearm fractures in pediatrics either kirshner wires or flexible nails.

AIM OF THE WORK

The aim of this work was to compare the results of intramedullary fixation of forearm fractures in children by elastic stable intramedullary nails and intramedullary k-wires.

SUBJECTS AND METHODS

A prospective case series, single Centre study in Alexandria University Hospitals October 2019 till August 2022. It included 40 patients.

All the children with displaced fractures of b.b, forearm were admitted and immobilized in splint with elbow in 90 to 120 degrees of extension, elevation and ice compression were advised.

Standard radiographs were done before and after surgery including an anteroposterior (AP), lateral, oblique views and forearm X-rays were done. Surgery is done under general anesthesia.

Closed reduction is done and after acceptable reduction Two Kirschner Wires vs Two Nancy Nails were inserted for fixation of both bone fracture; The Radial wire was inserted by surgical drilling through Lister's tubercle or the radial styloid. The Ulnar wire was inserted through the tip of the olecranon.

While regarding Nancy Nail, Radial intramedullary fixation was performed using a distal nail entry site through the radial-side metaphysis proximal to the physis, For the ulna, a proximal apophyseal entry point was used. The elbow was flexed and the arm was internally rotated to afford access to the olecranon.

Excellent	Union of Fracture Loss of flexion and extension at the wrist or elbow of less than 10° Loss of pronation and supination of less than 25%.
Satisfactory	Union of the fracture Loss of flexion and extension at the wrist or elbow of less than 20° Loss of pronation and supination of less than 50%
Unsatisfactory	Union of the fracture Loss of flexion and extension at the wrist or elbow of more than 20°, or loss of pronation and supination of more than 50%
Failure	Nonunion or unresolved chronic osteomyelitis

RESULTS

Table 1:Comparison between the two studied groups according to Andersons score (n=40)

Andersons score	GroupA (n=20)		GroupB (n=20)		c2	FEp
	No.	%	No.	%		
Satisfactory	2	10.0	2	10.0	0.0	1.000
Excellent	18	90.0	18	90.0		

The majority of cases 90% in group A and 90% group B had excellent in Andersons score, and there was no statistical difference between two groups regarding Andersons score. Satisfactory results are those with < 20% loss of flexion and extension at wrist joint or < 50% loss of supination and pronation. 4 cases showed satisfactory results because loss of flexion occurred in two cases, loss of supination and pronation movement occurred in two cases.

Table 2: Comparison between the two studied groups according to thelevel of satisfaction

Satisfaction	Group A (n=20)		Group B (n=20)		c2	P
	No.	%	No.	%		
Function					0.0	FEp= 1.000
Moderate	2	10.0		10.0		
Extreme	18	90.0	2	90.0		
duration			18		-	-
Moderate	0	0.0		0.0		
Extreme	20	100.0	0	100.0		
Appearance			20		0.125	0.723
Moderate	6	30.0		25.0		
Extreme	14	70.0	5	75.0		

Table 3 : Comparison between the two studied groups according to removal of implant

Removal of implant (weeks)	GroupA (n=20)		GroupB (n=20)		Test of sig.	P
	No.	%	No.	%		
8 weeks	16	80.0	16	80.0	c ² = 0.0	1.000
12 weeks	4	20.0	4	20.0		
Min.–Max.	6.0 –24.0		6.0 –24.0		U=200.0	1.000
Mean±SD.	8.40 ±0.82		8.40 ±0.82			
Median(IQR)	8.0(8.0– 8.0)		8.0(8.0– 8.0)			

This table shows that majority in both groups 80% were of 8 weeks in time of removal of implant and Mean ±SD of removal of implant in group A is 8.40± 0.82 weeks, and 8.40 ± 0.82 weeks in group B, and there is no statistical significant difference between two groups as regard removal of implant.

CONCLUSION

Intramedullary fixation should be considered a sound surgical technique in those children's diaphyseal forearm fractures that warrant surgical stabilization.

Excellent results can be achieved using K-wires or Nancy nailing.

The Nancy nailing do offer theoretical advantages but these did not appear to significantly improve outcome in our study.