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SUPRACONDYLAR FRACTURE HUMERUS (GARTLAND TYPE III) MANAGED WITH CLOSED REDUCTION AND PERCUTANEOUS PINNING (CRPP) IN CHILDREN.

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ABSTRACT … Objective: The objective of this study is to assess the functional outcome of close reduction and percutaneous K- wire fixation in supracondylar humeral fracture (SCHF) Gartland type III fractures in children. **Study Design:** Experimental study. **Period:** January 2017 to December 2017. **Setting:** Department of Orthopedics Civil Hospital Karachi. **Material & methods:** 60 children sustaining a Gartland type III supracondylar humerus fractures less than 1 week old that was treated by closed reduction and percutaneous pinning. Clinical results were evaluated using the Flynn's criteria. **Results:** All the 60 children with Gartland type III supracondylar humerus fracture included in this study. 42 (70%) boys and 18 (30%) girls with age ranging between 2 to 10 years .Right side was involved in 37(62%) and left side was involved in 23 (38%) patients. All patients are of extension type fracture. According to Flynn's criteria cosmetic results were excellent in 54 (90%) and good in 6 (10%) patients and functional results were excellent in 54 (90%), good in 4(7%), fair in 2 (2%) and poor in 1(1%) patient. One patient ulnar nerve injury, after 3 months nerve explored that was contused, symptoms resolved afterwards. **Conclusion:** Close reduction and percutaneous fixation with K-wire in Gartland III fracture in children is safe and effective treatment method with minimal hospital stay and less complications.

Key words: Supracondylar Humerus fracture (SCHF), closed reduction and percutaneous pinning (CRPP), Open reduction internal fixation (ORIF).

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INTRODUCTION

The fractures of elbow are not uncommon in pediatric population.[1,2] It is the most widely reported fracture in children accounting about 13% of the pediatric population and around 60% of elbow fractures in children.[3] these fractures in children must be treated properly otherwise they may lead to devastating complications including neurovascular problems and residual deformity. The two different types of supracondylar fractures are extension type constituting about 97-98% and flexion type about 1-3% of cases.[4] Gartland classified supracondylar humeral fractures into three types.[5] Numerous management options are available for dealing with such types of fractures, type1 fractures requires just proper splintage whereas for type II and type III supracondylar fractures various non-surgical and surgical options are available. Displaced supracondylar fractures can be managed either with open reduction or close reduction and K wire fixation. With Open technique fracture can be reduce anatomically, but there are chances of infection and stiffness around the elbow.[6] While close technique and percutaneous K-wire is safe, time saving, cost effective method.[7] Close technique need some training experience to reduce the fracture. Supracondylar fractures can lead to some of the following complications, nerve injuries, volkmans ischemic contracture, brachial artery injury, myositis ossificans and cubitus varus or valgus deformity.[8,9] The objective of this study is to evaluate the functional outcome of CRIF and K-wire fixation in Gartland type III fractures in children.

MATERIAL & METHODS

This study was conducted at orthopedic

department civil hospital Karachi between January 2017 to December 2017. Total of 60 patients were admitted with closed supracondylar fracture of Humerus Gartland type III through OPD and Emergency department and included in the study.

Inclusion Criteria

1. Closed supracondylar fracture (Gartland type III)
2. Fractures that were up to 5 – 7 days old

Exclusion Criteria

1. Open fracture
2. Fractures with associated neurovascular injury
3. Fracture more than 7 days old
4. Associated with compartment syndrome
5. Associated with other ipsilateral fracture

Flynn's criteria was used for the evaluation of final results[10] (Table-I). The results were graded as excellent, good, fair and poor according to the given criteria.

RESULTS

The 60 children were selected for this study. 42 (70%) boys and 18 (30%) girls with age ranging between 2 to 10 years. Right side was involved in 37(62%) and left side was involved in 23 (38%) patients. All patients are of extension type fracture. Cosmetically results were excellent in 54 (90%) and good in 6 (10%) patients and functionally results were excellent in 54 (90%), good in 3(5%), fair in 2 (2%) and poor in 1(1%) patient. One patient had ulnar nerve injury, after 3 months nerve was explored that was contused, symptoms resolved afterwards.

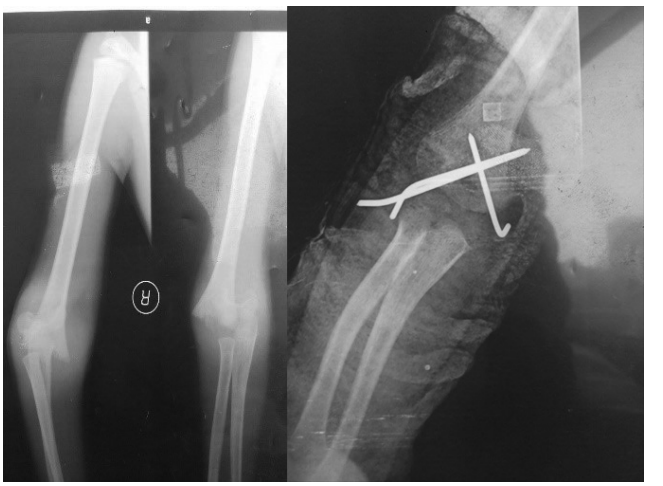
Two patients developed pin track infection which settled after removal of K-Wires at 4 weeks without any intervention. Union was achieved in all cases at about 4 to 6 weeks.

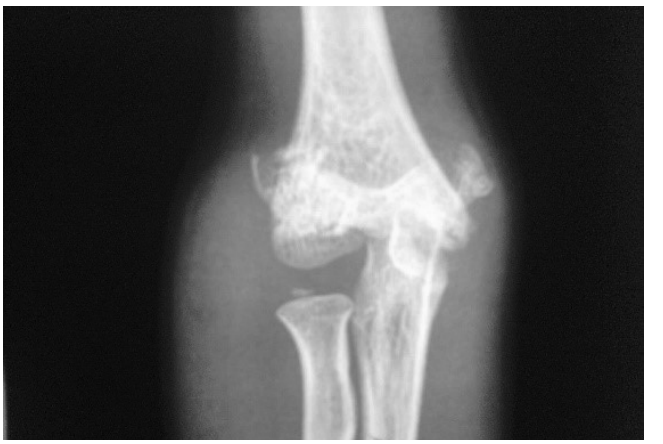
Results	Cosmetic - loss of carrying angle (degrees)	Functional - loss of range of movement (degrees)
Excellent	0 – 5	0 – 5
Good	5 – 10	5 – 10
Fair	11 – 15	11 – 15
Poor	>15	>15

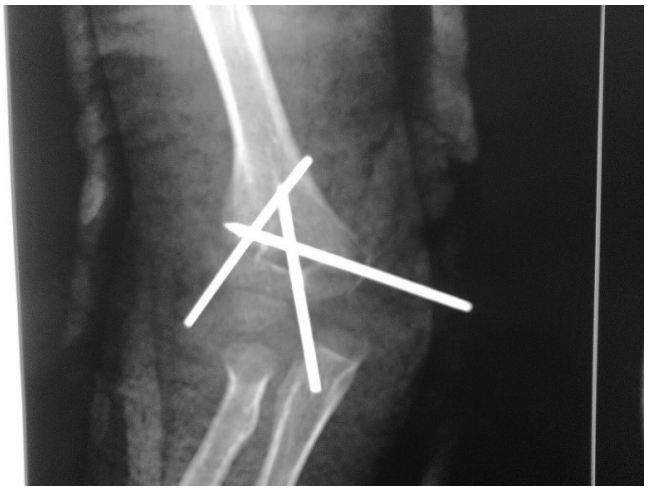
Table-I. Flynn's criteria

Results	Cosmetic	Functional
Excellent	54	54
Good	6	3
Fair	-	2
Poor	-	1

Table-II. Results







DISCUSSION

One of the most challenging fractures to treat in children is the displaced supracondylar fracture of the humerus. This usually occurs between the five to ten years.[11] The goal of the management in such fractures is to obtain a perfect anatomical reduction of fracture, full range of movement and cosmetically acceptable limb.[12-15] Variety of management options are there for the treating these displaced supracondylar fractures of humerus in children that includes skin traction, skeletal traction, CRPP / ORIF with k wire.[16] Closed reduction and percutaneous pinning of these fractures is being considered the treatment choice for these sort of fractures.[17,18] Lees complication are observed in closely managed fractures in terms of infection, myositis ossificans and loss of range of movements compared to other options.[19,20] Ulnar nerve injury due to medial pin placement is major problem especially in presence of swelling, it is about 2% to 3%.[21] Systematic review by Brauer et al showed that the likelihood of iatrogenic nerve injury is 1.84 times higher with cross pinning technique as compared to lateral pinning.[22]

Most commonly observed deformity after improperly treated supracondylar fracture is Cubitus varus, which occurs due to variety of factors such as horizontal rotation, coronal tilting, and posterior displacement leading to deformity.[16] Study by Harrington P et al[23] observed 83% good to excellent results, In another study conducted by Din S U, Ahmad I showed good to excellent results in 91.8% of cases.[24] In another study[25] good functional results were obtained in 21 (92% and poor results in 2 (8%) at the end of follow up. study conducted by Khan observed 88% excellent, four percent good and four percent poor results in his study.[26] Our study on displaced supracondylar fracture of humerus showed 95% good to excellent results are comparable to the result of the studies conducted by other authors. Multiple advantages of this procedure includes decreased hospital stay and financial burden, stabilization of fracture in minimally invasive manner, early mobilization resulting satisfactory functional outcome, improved cosmesis, decreased post-operative complication.

CONCLUSION

Closed reduction and percutaneous pinning is an excellent management option for displaced supracondylar fractures (Gartland type III), be careful while putting medial side K wire.

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If you're **persistent** you will get it,
If you are **consistent** you will keep it.

"Unknown"

AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Badaruddin Sahito	Reveiw of literature, Proof reading.	
3	Rukhsana Hamid	Data analysis.	
4	Nida	Data analysis, reviewing of article.	
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6	Ghulam Hussain	Rectification and Reviewing, References.	