

Closed Reduction and K-Wires Fixation in Supracondylar Fracture Humerus in Children

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ABSTRACT

Background: The supracondylar fracture of humerus in children is the most common fracture and has different methods of treatment. We studied the use of one of such modalities as closed reduction and k-wire fixation. We analyzed the results of this study. This is a prospective case series study.

Aim: To apply the recent advanced level of treatment for such fracture in our hospital setting where still old techniques of treatments are applied.

Methods: Forty cases of supracondylar fracture humerus of either types (Wilkin classification) and used the above mode of treatment under general anaesthesia. The patients were discharged on same day or next day and followed up at 3rd week for removal of k-wires in the dressing room without anaesthesia.

Results: The results of study were collected at different follow up periods (3,5 weeks and 6 months) and data entered in SPSS version 16 and analyzed with different variables.

Conclusion: It is concluded that closed reduction and k-wire fixation under C-arm is the best treatment for such fractures, in experienced hands the complication rate decreased to negligible level.

Keywords: Closed reduction + k-wire, Open reduction and internal fixation, Supracondylar fractures of humerus

INTRODUCTION

The supracondylar fracture humerus is the most common fracture seen in the young individuals. The most common cause is falling on outstretched hand while playing or bicycle riding. Supracondylar area of the humerus is anatomically weakest point of the humerus resulting in more fractures than dislocation in children. The types of fractures can be classified by Wilkins (Table 1) as type I undisplaced fracture line, type II, complete fracture with extension type but the posterior cortex is in contact. Type III, completely displaced fracture with no contact of bones. The rare type supracondylar fracture is flexion type injury in which the cause of the fracture is child falling down on his elbow resulting direct trauma and fracture fragment going in flexion. The modality of the treatment will remain the same. This is the 2nd most common area involved after distal radius fracture. The distal humerus is about 86% of the percentage of total humeral fractures. The peak incidence of such fractures is seen in 1st decade of life and boys are involved more than girls.

MATERIAL AND METHODS

This prospective case series was conducted in Orthopaedic Department, Jinnah Hospital, Lahore. The forty patients included in the study, out of which

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28 were male and 12 were female child. Mean age of the patient was 7.2 ± 3 years. All the patients were school going children. The types of fractures were labeled. Most cases were of type III Wilkin classification system. All the patients were admitted through emergency room and operated on the next available list. These cases can be operated as day surgery cases, if the facilities of C-arm was available in emergency room. The cases were evaluated at 4 hourly interval for the swelling, numbness and vascularity of the fingers and hands. Minimum attempt of reduction was done in emergency plaster room under conscious sedation only for type III cases and above elbow back slab applied and patients were shifted to ward. As mentioned four hourly monitoring in the form of pulse oximeter PO2 assessment, fingers and thumb movements and pulse assessment. In the next available list the cases were shifted to the operating room where under general anaesthesia, back slab removed, in some cases it was found to have blisters and swelling of moderate severity. Distal pulse assessed on table before proceeding for attempted reduction and k-wire fixation. The cases with open fracture and neurovascular injuries were excluded from the study.

On table closed reduction performed by the conventional reduction technique, the position of the reduction assessed under c-arm in both AP and lateral views. If the fracture reduction is satisfactory in both planes, k-wire of size 1.5mm with tapered end passed under aseptic condition, first k-wire passed

from medial to lateral as ulnar nerve is protected by the thumb pressures in medial condyle area and pin inserted anterior to the nerve and directed from anterior to posterior in the medial to lateral direction.

The position is continuously checked under c-arm. The 2nd wire passed from lateral to medial. At the end of the procedure the k-wires cut and bended outside the skin. Aseptic dressing applied cotton padding done and above elbow back slab applied. In the recovery room the post operative neurological status should be checked and documented. Cases followed up on 3rd, 5th week and 6 months.

RESULTS

Forty cases operated and included in the study on prospective basis. All cases outcome was unremarkable and according to the plan. Thirteen cases have the problem of pin tract infection which healed after the removal of these wires. The criteria of the satisfaction was used as in international studies (Wilkin’s criteria). Out of these forty cases, 4 lost follow up and might have gone to some other doctor for removal of wires. Thirty six patients were followed up with us in the clinic according to the charted plan. None of the patient has the poor or unsatisfactory results.

Table 1:

I	Undisplaced incomplete fracture
II	Complete fracture with incontact posterior cortex
III	Complete with complete displacement of fracture

Table 2: Frequency of type of fractures

Types	n	%age
Type I	3	7.0
Type II	8	20.0
Type III	29	73.0

Table 3: Frequency of outcome results of fractures

Outcome	n	%age
Excellent	22	61.0
Good	12	33.0
Satisfactory	2	6.0

DISCUSSION

As mentioned earlier the cases of supracondylar fractures of humerus are the commonest in the childhood between (ages of 3-11 years). The incidence in the literature is about 58% to the total fracture in children. Supracondylar humerus fractures in children can be treated by different methods like closed reduction and POP cast, closed reduction, k-

wires and open reduction and k-wiring. The complication rate was also calculated and compared with the different studies outcome in the forms of functional and cosmetic results and found to have good results.

Previously people used to treat the type I and II fracture conservatively but have observed displacement of the fracture leading to cubitus varus deformities. In our study we tried to perform closed reduction and k-wires fixation in all types of supracondylar fractures with excellent to good results and minimal complication rate. Mean age of the patients were 7±3 years and mean time of surgery was 25±10 minutes. None of the case was converted to open reduction and k-wire fixation which indicates the level of success we achieved. Only argument against this procedure is general anaesthesia with its complications and also the admission/cost in the hospital. Our reply regarding this is, the patients were admitted having the benefit of all routine investigations and preoperative anaesthesia assessment with which it lead to very minimum complication rate of anaesthesia. The cost effectiveness as we feel is that all of our patients have almost 98% result which is more important than the cost of surgery itself at later stage for the correction of complication.

CONCLUSION

In children supracondylar fractures humerus of any type by classification should undergo closed reduction and k-wire fixation leading to routine hospital follow up and excellent functional and cosmetic results.

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