ORIGINAL ARTICLE

Functional Outcome of Open Reduction and K-wire Fixation for Neglected Fractures of Lateral Condyle of Humerus in Children

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ABSTRACT

Aim: To evaluate the functional outcome of open reduction and K-wire fixation for neglected fractures of lateral condyle of humerus in children in terms of achievement of union and range of motion at elbow joint.
Study Design: Descriptive case series study.
Place and Date of Study: Department of Orthopedic Surgery, GMMMC Hospital, Sukkur over a period of 18 months from 1st April 2015 to 30th September 2016
Methods: This study included 34 pediatric patients, who presented three or more weeks after the initial injury, with displaced Jacob type II and III, closed fractures of lateral condyle of humerus of either sex between ages of 2 to 12 years.
Results: There were 27 males and 7 females. Average follow-up was 6 months. Three patients lost follow-up. No mortality was observed. Satisfactory range of motion (functional range of motion lacking less than 15° of complete extension) was observed in 17 (54.9%) patients while 14 (45.1%) patients had non-satisfactory range of motion at elbow.
Conclusion: Fracture of lateral epicondyle humerus is a fracture of necessity, early diagnosis and appropriate treatment is vital for management of these fractures to avoid complications. However if patient presents late, majority can still be benefitted by surgical intervention rather than leaving unattended.
Key words: Range of movement, K-wire fixation lateral condyle, Distal humerus

INTRODUCTION

Worldwide, breakage of oblique condyle of brachium in kids is fairly general injury presented in health care centers. However, most of the research reported that the neglected displaced breakage of oblique condyle of branchium in kids is a rare traumatic injury[1-3]. The estimated rate of this fracture in children is reported 18.5 to 20% of all fractures of the distal end of the humerus[4]. Treatment of this condition remains one of the difficult problem in patients having ages 2 to 5 years because of growing age of the children. Conservative treatment may lead to bad functional results while surgical treatment of lateral condyle fracture shows better results with rare complications. Previously, many of researches demonstrated that surgical treatment may lead to post-operative complications such as avascular necrosis and the residual post-operative deformity[5,6].

Breakage of oblique condyle of brachium starts sideways in the growth process and then fall between the condyles to proceeds towards the elbow joint. Several techniques have been used for the treatment of ignored breakage of oblique condyle of brachium but the most useful method and having better outcomes is surgical procedure.[7] The most commonly used classification of lateral condyle fracture is Jacob's classification, which is based on the amount of displacement between the fragments. Jacobs type II has 2 to 4mm displacement and type III define complete displacement with rotation.

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Nondislocated or littlest dislocated category I breakgaes can simply be handled with a expulsion, just like several category II breakages[2]. Nevertheless the cure of choice for the majority category 2 and category 3 fractures is open reduction and internal fixation because it put off complexties that come up because of unrestrained breakage[8-10]. The most commonly performed surgical procedure for the healing of the neglected fractures of oblique condyle of humerus is unwraped reduction and K-wire fixation. Many of studies show better results at 6 months to 1 year follow-up. It carries lesser post-operative complications and the better results in terms of motion at elbow joint and rotation[11,12].

This study was conducted to evaluate the functional outcomes of open reduction and K-wire fixation for neglected breakages of oblique condyle of brachium in kids (fracture of necessity) in terms of achievement of union and range of motion at elbow joint.

MATERIALS AND METHODS

This descriptive study was conducted at Hospital Ghulam Mohammad Mahar Medical College Hospital over a period of 18 months from 1st April 2015 to 30th September 2016. In this study we included 34 pediatric patients of both genders who presented three or more weeks after the initial injury, with displaced Jacob type II and III, closed fractures of lateral condyle of humerus. Patient's ages were ranging from 2 to 12 years. Patients who were not interested and those having history of previous surgical treatment was excluded from study. After taking informed written consent from all the parent/guardians of the patients, detailed medical history and patients were examined. All the patients had undergone surgical treatment with open reduction and k-wire fixation. After surgery plaster of paris was used for 30 to 45days. K-wires were extracted in 30 to 60 days .After removal of plaster of paris range of

movement exercises were started and patients were advised any passive stretching and to avoid the heavy movement of elbow. Complete follow up was taken at 6 months and the outcome was great ,good, better and poor. All the statistical data was analyzed by using computer software SPSS 19.0.

RESULTS

In this study, we included 34 pediatric patients. Out of all 34 patients 27 (79.4%) patients were males and 7 (20.6%) patients were females. 7 (20.6%) patients were ages 2 to 4 years, 13 (38.2%) patients were ages 5 to 8 years and 14 (41.2%) patients had ages 9 to 12 years. 25 (73.5%) patients had rural residency while 26.5% patients had urban residency (Table 1). All patients had undergone surgical treatment. Average follow-up was 6 months. No mortality was observed. Three patients had lost follow-up. Satisfactory range of motion (functional range of motion lacking less than 15° of complete extension) was observed in 17 (54.9%) patients range of motion was noted as excellent in 9 (29%), good in 05 and fair in 03 patients. patients. while 14 (45.1%) patients had non-satisfactory range of motion at elbow (Tables 2-3, Figs. 1-4).

Table 1: Demographical information of patients

Variable	No.	%
Gender		
Male	27	79.4
Female	7	20.6
Age (years)		
2 – 4	7	20.6
5 – 8	13	38.2
9 – 14	14	41.2
Residence		
Urban	8	26.5
Rural	25	73.5

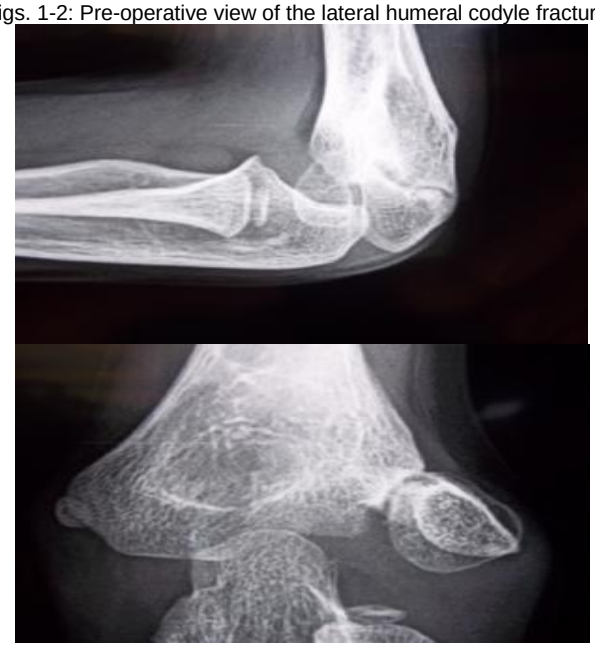
Table 2: After Follow-up findings of all the lateral condyle fractures

Variable	No.	%
Mortality		
Yes	-	-
No	34	100.0
Complete follow-up		
Yes	31	91.2
No	3	8.8
Findings after follow-up (n=31)		
Excellent	9	29.0
Good	5	16.1
Fair	3	9.7
Poor (no-satisfactory)	14	45.1

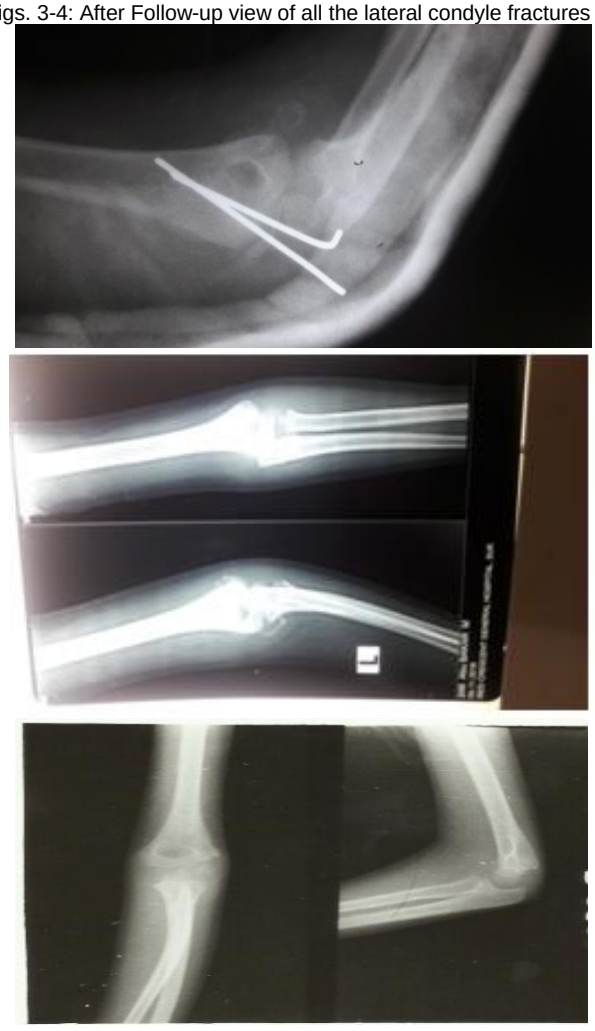
Table 3: Findings according to displacement

Variable	No.	%
Jacob Stage II		
Excellent	5	16.1
Good	3	9.7
Fair	2	6.5
Poor (non-satisfactory	9	29.0
Jacob Stage III		
Excellent	4	12.9
Good	2	6.5
Fair	1	3.2
Poor (non-satisfactory	5	16.1

Figs. 1-2: Pre-operative view of the lateral humeral codyle fracture



Figs. 3-4: After Follow-up view of all the lateral condyle fractures



DISCUSSION

Globally, It is common to see the lateral condyle fractures of humerus in children. In developing country like Pakistan and India these type of fractures is commonly seen in surgical departments.[13] The most common reason for presenting late after initial injury in our settings was faith and belief in traditional bone setters, financial problem and missing the early un-displaced fractures. The management of lateral condyle fractures of humerus presenting late is largely disputed over conservative versus surgical treatment[14]. In our study, we included 34 pediatric patients. Out of all 34 patients 27(79.4%) patients were males and 7(20.6%) patients were females. These results show similarity to some other studies in which frequency of male patients was high as compared to females 60 to 80%[15,16]. Another study conducted regarding lateral condyler humeral fractures demonstrated that females patients population was high as compared to males 65%, 45%[17].

In this study, we found 7(20.6%) patients were ages 2 to 4 years, 13(38.2%) patients were ages 5 to 8 years and 14(41.2%) patients had ages 9 to 12 years. 25(73.5%) patients had rural residency while 26.5% patients had urban residency. A study conducted in India reported that frequency of rural residency patients was high as compared to urban residency[18]. Another study reported that the children having ages 6 to 12 years had a high prevalence of lateral condyler humeral fractures[19].

In our study, after surgical treatment we found no mortality and three patients had lost follow-up. Satisfactory range of motion (functional range of motion lacking less than 15 of complex extension) was observed in 17(54.9%) patients was noted as Excellent in 9(29%) patients, 5(16.1%) patients and 3(9.7%) patients. while 14(45.1%) patients had non-satisfactory range of motion at elbow. We found results according to the displacement Jacob II and Jacob III. Many of studies shows similarity to our study according to the classification[19,20]. In our study we observed that 14 patients had poor results, it may be due to not follow the advice given to the patients and non-cooperative behavior of patients. This was same to other study, in which poor satisfactory rate was high and the factors associated to these results were non-cooperative behavior of the patients[21].

CONCLUSION

Fracture of lateral epicondyle humerus is a fracture of necessity, early diagnosis and appropriate treatment is vital for management of these fractures to avoid complications. However if patient presents late, majority can still be benefitted by surgical intervention rather than leaving unattended.

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