ORIGINAL ARTICLE

Outcome of Displaced Lateral Condyle Humerus Fractures in Children's Treated with K-wire Fixation

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ABSTRACT

Objective: To assess the outcome of lateral condyle of humerus fractures stabilized with K-wire fixation.

Methods: This prospective study was conducted in department of orthopaedics at Chandka Medical College Hospital, Shaheed Mohtarma Benazir Bhutto Medical University Larkana from March 2011 to February 2013 in two Years period. We managed 30 children with lateral condyle humerus fractures Milch type III according radiographic criteria and stabilized by open reduction with K.wire fixation.

Results: Total Thirty children were evaluated, from which twenty were boys (6.66%) and ten were girls (3.33%). The mean age was 7.5 years. 26(6.66%) were of right dominant elbow; rest was the left dominant (3.3%). Operation time was 45 minutes, no minor and major complications of anesthesia and surgery appeared regarding the criteria was observed. Clinical results in 26(86.66%) were excellent, good in 03(10.0%) and poor in 01(0.33%) patient according to Hardcare criteria.

Conclusion: We concluded that displaced lateral condyle fractures with open reduction and fixation with k-wires hence early fixation is much more correct and responsive method to get the union and to prevent from complications

INTRODUCTION

Fractures in children are very common in Humerus[1] but lateral condylar fracture is the second most common around the Elbow, contributes 10% of all[2,3,4]. Closed reduction with K-wires is quite difficult to treat at the age of 06 to 07 years. Fracture usually occurs on out stretched hand and extension of elbow. Lateral condyle fractures of humerus starting from the epicondyle side, down into the joints near the capitellum and trochlea. Whereas parts of fractures are usually Epiphysis of capitellum, lateral portion of trochlea and humeral metaphysis. On other hand avulsion and fragment displacement becomes subcutaneous causes on extensor muscle. **Milch** classified these in two types. **Type I** usually stable, fracture line travel medially in to Capitell-u-Trochlear group resembles as Salter Harris type IV. **Type II** are most frequent and extends in Trochlear bone resembles as type II Salter Harris. Open reduction and stabilization are the most excellent approaches for unstable, displaced and rotated fracture of lateral condyle. These injuries are difficult to handle because of many problems and complications, so it's necessary to reduce and stabilize the lateral condyle fractures earlier to prevent from the complications at elbow like mal union, non-union. Cubits valgus osteonecros is appeared due to excessive soft tissue destruction and loss of full range movements[5]. There is less focus on close reduction in the literature[6,7,8]. Our best practices and experiences of open reduction and fixation with K-wire in unstable, displaced fractures were remains excellent in terms of various results such as range of motion, carrying angle and post-operative pain.

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METHODS

This prospective study was conducted in the department of Orthopaedics at Chandka Medical College Hospital, Shaheed Mohtarma Benazir Bhutto Medical University Larkana from March 2011 to February 2013 for two years. We admitted 30 patients from Out Patient and emergency department after complete clinical evaluation and assessment i-e history, examination, blood investigation, antero posterior and lateral radiograph. Displacement of fracture identified from the lateral cortex of humerus at distal area towards the lateral cortex of fragment on the Antero posterior view, posterior cortex on the lateral view of radiograph. We included Milch type II closed fractures within 12 weeks. After counseling regarding the surgical procedure and consent from the parents for general anesthesia was taken, the pneumatic

tourniquet was applied. After aseptic measures, limb was draped and through lateral approach, fracture opened through soft tissue dissection and then reduced under direct vision. After reduction stabilized with two K- wires.

For fracture stability, the elbow movements were checked per operatively drain placed for 48 hours and wound closed. Soft dressing above elbow slab was applied and Kept for three weeks'. Stiches removed after one week, pins removed after union achievement, i-e appearance and solidification of callus visible on the anteroposterior and lateral views of x-ray and other assessments. K-wires removed after four to six weeks. Physiotherapy started earlier i-e removal of slab, we thought that for early mobilization of joint, removal of slab gives less chance of stiffness and build the confidence of children and for the better hope of activities. Forearm movements i-e supination, pronation, flexion and extension did not change.

Evaluation of results by hard acre et al[9].

	Range of motion	**Carrying angle**	**Symptoms**
Excellent	No limitation	No alteration	No Symptoms
Good	Functional range of motion (no more 15 degree of complete extension.	Inconspicuous alteration	No, Arthritic, Neurologic symptoms
Poor	Disabling loss of function	Conspicuous alteration	Arthritic symptoms, ulnar neuritis, roentgen findings of nonunion, avascular necrosis

RESULTS

Total thirty)\ children were evaluated, from which twenty were boys (6.66%) and ten were girls (3.33%).

Table – A:

Union Rate	**Outcome**	**Percentage**
Excellent	26	86
Good	03	10.00
Poor	01	0.33
Total	30	100%

Table – B:

Variables	**Numbers**	**Percentage**
Male	20	6.66%
Female	10	3.33%
Right Elbow (Dominant)	26	6.66%
Left Elbow	4	3.3%
Age (mean)	7.5 years	

The mean age was 7.5 years. 26 (6.66%) were of right dominant elbow whereas rest were left dominant elbow (3.3%). Management was started as early possible as local circumstances of patient allowed and followed for above-mentioned period. Operation time was 45 minutes and there were no minor and major complications of anesthesia and surgery regarding the criteria were observed. Clinical results in 26 patients (86.66%) were excellent, good in 03(10.0%) patients, poor in 01 (0.33%) patient according to Hardcare criteria.

Table – C:

Mean union time (mean)	5.4 weeks
Immobilization Time (mean)	5.4 weeks
Removal of K-wire (mean)	5 weeks

DISCUSSION

Road accidents, falls, injuries from a motorcycle cycle, games injuries are common in our society, though the lateral condylar fracture is one of the most common fractures in children. Whereas it is often ignored and recommended for treatment of bonesetter. Sometimes slight fracture, when it is treated in adequate manner leads to loss of elbow actions. Moreover, unanimously agreed that closed reduction of displaced and rotated lateral condyles fractures is quite difficult to maintain position, function and cosmetically un-satisfactory outcome[9,10,11]. Open Reduction and Internal Fixation is

only technique of treatment, which is widely used for the displaced and unstable fractured.

Though, it is difficult to maintain the reduction in specific patients but displacement has been successfully reduced by 2mm to 4mm as discussed by Mintzer et al, moreover also minimally displaced reduced openly by Foster[12]. Only few reports have focused on closed reduction and internal fixation (CRIF)[13]. Cohort study shows the internal Oblique radiograph view more appreciable then AP view for diagnostic purpose[14]. Nowadays 20 degree tilled AP view is being suggested for displacement. Many believe that presence of intact articular cartilage is the hinge and key to stability of fracture. Though, stress test, high resolution Ultrasound (HRS), MRI and contrast Arthrography are being used for identification of cartilaginous hinge[14,15,17]. Drawbacks of these are unavailable everywhere, costly and time consuming. Investigations are expensive; preparation is difficult sedation, and technical expertise for evaluation of results so limits their use in clinical experience.

Dhillon do not recommend osteosynthetic procedure of 06 weeks[18]. Shen study 13 patients in 04 weeks, observed good outcome movements and cosmetic results[19]. Mazurek and Skorupki operated 07 year's old nonunion through olecranon osteotomy k-wire fixation observed good result after 06 months[20]. In another study of Bhaharuddin M, conducted in 2001, fracture with screw in 20 cases, 19 out of that were excellent at one year follows up[21]. Wattenbarger et al conducted cases of 3 week's late presentation, did not find any cases of AVN[03]. There are lot of issues in our society i-e late presentation, lack of knowledge and often ignored in expect that these fracture are simple, but they can unite in future. Lack of understanding, miss diagnosis and improper treatment leads to a lot of complications. Due to lack of severe complications in our study, good clinical results are noteworthy arguments to use for open reduction and internal fixation however those of us, due to great deal of experience in children's along fracture of elbow, do often see complication of nonunion, physical arrest and osteonecrosis after surgery with that, being said more over ORIF has been confirmed accurate and best approach to obtaining and maintaining of reduction with low morbidity and good clinical results.

In our opinion, duration of study keeps weight in outcome for those who are late more than 12 weeks. If lateral condyle fracture left untreated mal union, nonunion, proximal migration of fragment cubitus valgus, tardy ulnar nerve palsy, AVN, limitation of movement and cosmetic defects may occur.

CONCLUSION

Current study of 30 (Thirty) cases of unstable and displaced fracture with ORIF and K-wires. Therefore in light of current study, results recommended as early fixation is much more perfect and sensitive method to get the union as well as to avoid the complications but must not be desolation despite the results. Such kind of cases must be treated with ORIF, which present up to twelve weeks for the reason that elbow is really nice for union in children. It should be attempted as soon as possible in favor of best results.

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