
SEVERELY DISPLACED AND ROTATED LATERAL CONDYLAR FRACTURE OF HUMERUS IN CHILDREN

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Summary

Eight children between 4 and 10 years old with displaced and rotated fractures of the lateral humeral condyle were treated by open reduction and internal fixation. In all cases union occurred. There were no complications apart from one case developed stiff elbow which need manipulation under anaesthesia later on.

Introduction

Fractures of the lateral condyle of the humerus are quite common and occur at approximately the age 6 years^{2,14}. In fact they are the most common distal humeral epiphyseal fractures, they are more common than those of the medial epicondyle, or the fracture separation of the entire distal epiphysis. Lateral condylar fracture has been classified according to the amount of displacement of the metaphyseal fragment and integrity of the articular cartilage⁸ (Figure 1).

Milch also classified this fracture into two types according to the principle of epiphyseal injury² (Figure 2).

Type I fracture which is Salter-Harris type 4 (rare) and type 2 which is Salter-Harris type II (more common).

This report presents the results of 8 children with severely displaced and rotated lateral humeral condylar fracture of humerus (type II Milch) treated by open reduction and internal fixation.

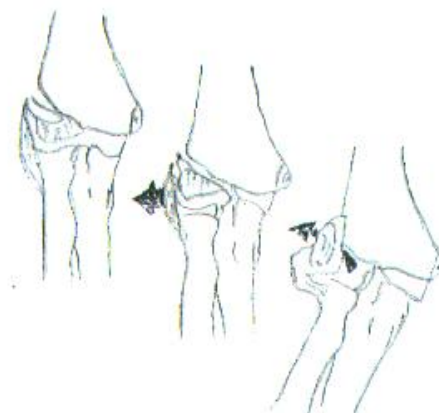


Figure 1. Different displacement of the lateral condylar fracture, undisplaced, moderately displaced and completely displaced and rotated.

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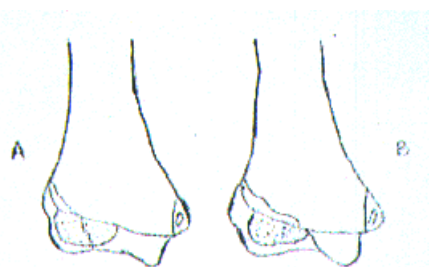


Figure 2. Lateral humeral condylar fracture.
A-Milch type I fracture,
B- Milch type II fracture

Patients and Methods

During a four-year period, 8 children with severely displaced and rotated fracture of the lateral humeral condyle were treated in our hospital. There were 6 boys and 2 girls whose age range from 4-10 year (average 6.5 years) (Figures 3 and 4).

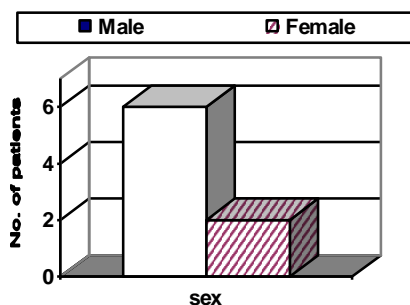


Figure 3. Sex distribution of the patients.

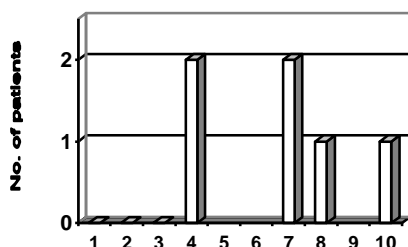


Figure 4. The age of the patients.

The left side was affected in 6 cases. All fractures were caused by fall. Diagnosis in all cases was made on

standard roentgenograms of the affected elbow. There were no other injuries to the fracture elbow. All patients were treated by open reduction and internal fixation. Under general anaesthesia an attempt was made at closed reduction under fluoroscopic control but complete reduction could not be achieved in that way. With Esmarch tourniquet in place classical lateral approach to elbow was made. Further manipulation of the fragment allowed reduction that was held in the correct position and fixed with k-wires in 5 and with screw in 3 cases (Table I). Redivac drain was used in all cases, which was removed 48 hours postoperatively. Postoperatively the elbow was immobilized in back slab above elbow at right angle and forearm in neutral position for 3 weeks. All patients had regular follow up consultation and seen on outpatient bases. The follow-up period ranged from 3 years to 6 months. All patients had clinical and radiological examination, they were evaluated regarding elbow deformity, elbow flexion, extension and pronation-supination in comparison with the contra-lateral side.

Table I. Methods of treatment

Cases	Age/ year	Methods of treatment		Time interval between accident & surgery
		Closed	Opened	
No.1	10	Failed	Screw	5 days
No.2	4	Failed	k-wire	4 days
No.3	6	Failed	k-wire	1 day
No.4	8	Failed	Screw	4 days
No.5	7	Failed	Screw	7 days
No.6	4	Failed	k-wire	4days
No.7	7	Failed	k-wire	4 days
No.8	6	Failed	k-wire	4days

Results

All patients were able to perform normal elbow movement and normal daily activities without pain, but they all having limited mobility after removal of the back slab. Only 1 patient had physio-

therapy for one month because of developing elbow stiffness which need manipulation under anaesthesia at time of removal of internal fixation 3 months after surgery and later on the regained full range movement. There were no cases of elbow deformity (varus or valgus angulation) and no patient had infection. There were no clinical or radiological sign of non-union.

Discussion

The lateral condyle fracture of humerus in children is a relatively frequent fracture and accounts for 10- 20 % as all elbow fracture in the pediatric population^{2,5}. It contains the epiphysis of the capitellum the lateral epicondyle, part of the distal humeral metaphysis and possibly a part of the trochlea^{8,10}.

Clinically, the patient present with pain, marked swelling and tenderness on the lateral side of the elbow¹. The diagnosis is made on routine radiography of the elbow which show the fragment detached, displaced rotated and it lies almost up side down. Stress views, intra-operative arthrogram or magnetic resonance

image (MRI) where not necessary to make the correct diagnosis in this series and other series^{2,11,13,15}.

In children treatment options include closed reduction^{3,10} and open reduction with internal fixation (ORIF)^{1,2,4,6,7}. Closed anatomical reduction under image-intensifier was not possible in our patient. In open reduction a wide variety of technique of internal fixation are described as there are kirschner wire fixation, sutures, screws or pins^{1,2,4,6,7,8,10}. A simple and relative stable fixation with small screw or k- wire was used in our patient. This provided good stability and allowed early active motion after splint removal.

In conclusion:

- 1) We feel there is no place for closed reduction in such fracture and surgery (ORIF) is a must.
- 2) Although certain pre-operative parameters can give clue about suitable method of fixation to be used (e.g. age of patient, size of metaphyseal fragment on x-ray, etc.) we found that, the operative look is the most accurate way for deciding the option of fracture fixation.

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