

# Outcome of Osteosynthesis of Maltreated Lateral Humeral Condylar Fracture in Children

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## ABSTRACT

**Objective:** To determine the outcome of osteosynthesis of maltreated lateral humeral condylar fractures in children.

**Material and methods:** This Interventional quasi-experimental was carried out in the department of orthopedic surgery Nishtar Hospital, Multan from July 2006 to January 2007. Thirty children admitted through OPD having maltreated lateral humeral condyle fracture were included relevant investigations and x-rays were done. After surgery if union was evident then pins were removed and then the physiotherapy of the patient was started. If consolidated union were not found then patients were followed.

**Results:** Nineteen (63.33%) male and 11(36.67%) female were treated for fracture of lateral condyle of humerus results were excellent in 4(13.33%) good in 16(53.34%) and satisfactory in 10(13.33%) cases. A vascular necrosis was not seen in any case.

**Conclusion:** In maltreated lateral humeral condyle fracture treated by osteosynthesis, pain free, stable elbow is achieved. Deformity of elbow either cubitus varus or valgus with tardy ulnar nerve palsy is prevented

**Keywords:** Fracture, osteosynthesis, maltreated, humerus

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## INTRODUCTION

Fractures of lateral humeral condyle are common in children accounting for 10% to 20% of pediatric elbow fractures<sup>1</sup>. Avulsion of the lateral condyle is commonest between the ages of 3 and 5<sup>2</sup>. Mechanism of injury is by fall on the hand with the elbow extended and forced into valgus<sup>3</sup>. It can secondarily be fractured by the pull of the lateral collateral ligament and extensor muscles<sup>4</sup>. Classification of lateral condyle of humerus can be described by either the anatomic location of the fracture line or the stage of displacement. Missing or inadequately treated lateral humeral condylar fracture can lead to nonunion abnormalities in carrying angle prominences of lateral humeral condyle, cubitus valgus and tardy ulnar palsy<sup>5</sup>. Surgical osteosynthesis done carefully can give good results rather than leaving the delayed fracture alone<sup>6</sup>.

## MATERIALS AND METHODS

This Interventional quasi-experimental was carried out in the department of orthopedic surgery Nishtar Hospital, Multan from July 2006 to January 2007. Thirty children admitted through OPD having maltreated lateral humeral condyle fracture were included relevant investigations and x-rays were

done. After surgery if union was evident then pins were removed and then the physiotherapy of the patient was started. If consolidated union were not found then patients were followed.

## RESULTS

Out of total 30 patients, 19(63.33%) were male and 11(36.7%) were female. The ages of the patients were ranged from 3-10 years. Mean±SD was 7.10±2.04. Majority of the patients were 7-10 years of age. A scoring system was modified from Broberg and Morrey. We added points for each character. Following the criteria of Broberg and Morrey, following results were obtained. Four (13.3%) patients had excellent character. Sixteen (53.4%) had good character. Ten (33.3%) had satisfactory character and no patient had poor character.

Range of motion at final follow up of our study at 12 weeks was 30-130 degrees in 9 (30%) patients, 40-120 degrees in 16 (53.3%) patients and 50-110 degrees in 5 (16.7%) cases (Table 1). Pain was relieved in 25 (83.3%) patients after osteosynthesis while five (16.7%) cases had persistent pain as mentioned in table-2. The time of union was less than 4 weeks in two (6.7%) cases 6 weeks in six (20.0%) cases 8 weeks in ten (33.3%) and 12 weeks in twelve (40%) cases as shown in table-3. Due to short postoperative follow up of 12 weeks, we did not see any case of a vascular necrosis. Stability was seen in twenty six (86.7%) patients out of thirty

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patients at final follow up of 12 weeks. four (13.3%) cases had unstable elbow Table-4. Parents of twenty patients were happy and 5 were concerned. Five were dissatisfied.

Table 1: Range of motion (n=30)

Range	=n	%age
Full	-	-
30-130	09	30.0
40-120	16	53.3
50-110	05	16.7

Table 2: Pain relief (n=30)

Pain relief	=n	%age
After 4 weeks	08	26.7
After 6 weeks	12	40.0
After 8 weeks	05	16.7
After 12 weeks	05	16.7

Table 3: Time of union (n=30)

Duration	=n	%age
Full	-	-
30-130	09	30.0
40-120	16	53.3
50-110	05	16.7

Table 4: Stability of elbow (n=30)

Stability	=n	%age
Stable	26	86.7
Unstable	04	13.3

## DISCUSSION

Fracture of lateral condyle is common in children. Delayed presentation of this fracture poses a problem. In our country the problem of illiteracy, ignorance and non-availability of medical facilities result in delayed presentation. After about one month and one and a half month on an average, parents of patients note that elbow is not moving properly and there is bump on lateral aspect of elbow. The time when they get worried and consult an orthopedic surgeon. The problem for the doctor is what to do with these late presenting cases.

Jakob and Fowles in their detailed study of the results of delayed surgery recommended that displaced fracture more than 3 weeks should be left alone and ulnar nerve transposed anteriorly to prevent tardy ulnar nerve palsy<sup>8</sup>.

Among the authors who recommend surgery Bohler had good results, Flynn, Tachdijian and Wilkins are of the opinion that operative treatment should be done and reported good results of late surgery provided proper care is taken to avoid damage to the blood supply of fracture fragments<sup>7,9,10</sup>.

Shimada et al believe that osteosynthesis is indicated for these fractures in children not only for

those who have pain but also for less symptomatic cases<sup>11</sup>.

Royal et al and Schneider et al have recommended osteosynthesis after reduction of fragments of old fracture of lateral condyle<sup>12,13</sup>. Shibata et al reported benefits of osteosynthesis and recommended fixation without alignment of fragmen<sup>14</sup>.

Inoue and Tamura fixed old fractures in situ with bone grafting<sup>15</sup>. Range of motion decreased by an average of 6.7 degrees. They disagree that loss of motion and deformity occurs after fixation. But they themselves have shown that decreased range of motion does occur. They also recommended surgical treatment for a strong stable elbow.

Morrey says that for most activities full potential of the elbow is not needed. Loss of terminal flexion being more disabling than the same degrees of loss of extension<sup>16</sup>. Before embarking on this surgery, parents and patients were explained that the final outcome of operative treatment could be better than previous regarding pain, stability and strength. It was also explained that expectation of getting increased range of motion could not be achieved, but a more useful hand is anticipated. Only patients who accepted this were operated. In the end although they were not able to increase their range of motion, they were satisfied with the outcome as the elbow was more stable, pain free and useful in daily activities.

After considering the results in these patients, we recommend that even late case should be operated, to give a pain free and stable elbow, so that work is restored even if range of motion is not increased

## CONCLUSIONS

In maltreated lateral humeral condyle fracture treated by osteosynthesis, pain free, stable elbow is achieved. Deformity of elbow either cubitus varus or valgus with tardy ulnar nerve palsy is prevented

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