

# Complex injury of the Elbow in an 8 years Male child – Extreme valgus stress injury : A Case Report

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## Abstract:

*Complex fracture patterns in the elbow joint are rare as compared to the simple fracture patterns. We report a case of extremely complex fracture pattern –elbow subluxation with fracture of the medial epicondyle of humerus with a completely displaced and angulated fracture of the radial neck and fracture of the olecranon in an 8 years male child. He was operated with open reduction and fixation of the fracture medial epicondyle of humerus, closed reduction and fixation of radial neck and the olecranon. The elbow stability was satisfactory and child achieved a good functional result.*

**Key words:** Extreme valgus injury, Complex injury of the Elbow, Radial Neck fracture, Medial epicondyle humerus fracture, Olecranon fracture.

## Introduction

Fracture around the Elbow is one of the most common injury that occurs in the Paediatric age group [1,2]. Of these the simple injury patterns such as fracture of the supracondylar humerus, lateral or medial condyles and epicondyles, olecranon and radial head form a major chunk [1,2,3]. More complex injuries like the Monteggia fracture-dislocation and elbow dislocation with an associated epicondyle avulsion fracture or condyle fracture also occur but they are relatively rare as compared to the more simple injury patterns [4,5,6]. The assessment of the elbow can be difficult because of the changing anatomy of the growing skeleton. We report a case of an extremely complex injury of the Elbow – fracture of the medial epicondyle of humerus with fracture of the radial neck and fracture of the olecranon with elbow subluxation in an 8 years male child.

## Case Report

An 8 years male child presented to us in the casualty with a painful and swollen left elbow after sustaining a fall on the outstretched hand while playing. He presented to us 4 hours post-injury. On examination he had tenderness on both the medial and lateral aspect of elbow and also over the olecranon. Radial and Ulnar pulsations were well felt. The child was able to do active movements of his fingers and the Sensations over his entire right upper extremity were preserved. He did not

have stretch pain. There was no breach in the skin continuity over the elbow. He had minor abrasions over the palm. He did not have an injury elsewhere and his General and Systemic examinations were within normal limits.

Xrays of his Left elbow Antero-Posterior and Lateral (Fig - 1) view were done. They revealed a complex injury pattern – fracture of the medial epicondyle of humerus with a completely displaced and angulated fracture of the radial neck with a fracture of the olecranon and a dislocated elbow.

A temporary posterior above-elbow slab was applied .CT SCAN was done and fracture pattern was confirmed. The child was taken immediately to the Operating Room (OR). Intraoperatively – First an Open Reduction was done for the displaced fracture of the medial epicondyle of the humerus through a standard medial approach protecting the ulnar nerve. The fracture was exposed, reduced and it was fixed by 2 smooth 1.5 mm K-wires. Secondly the fracture of the radial neck was closed reduced with the help of a percutaneously placed K-wire in the radial head and fixed with a TENS inserted through the distal end of the radius. The K-wire was removed. The elbow reduced automatically after fixation of the columns of the elbow.

Lastly the olecranon was fixed with a percutaneously placed K-wire. The final reduction and stability of the elbow was confirmed under an image intensifier in both AP and lateral views – was found to be satisfactory. Wash was given to the medial wound and primary closure was done over a negative suction drain. The medially placed K-wires were buried beneath the skin. Dressing was done and a posterior above-elbow slab was applied with sling support.

Post-operatively - The drain was removed after 24 hours and the stitches were removed on 12th post-operative day. His wound healed well. There was no distal neuro-

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vascular compromise. The posterior above-elbow slab was continued for 3 weeks after which gentle range of motion exercises for the elbow were started.

At 4 weeks post-operatively, the percutaneously placed K-wire for the olecranon was pulled out as an outpatient procedure. Patient was followed up on regular intervals. The range of motion of his elbow improved gradually. Serial Xrays were done to evaluate fracture union. At 3 months post-operatively the Xrays (Fig – 2) showed a complete union of all the fractures and the child was taken up for implant removal and all his implants were removed. His post-operative recovery after implant removal was uneventful (Fig – 3).

### Discussion

Apart from drugs, infection, tourniquet and surgical sThe elbow is one of the most commonly injured part in the paediatric age group [1,2]. Isolated fracture of one anatomic part i.e a simple fracture pattern is the most common form of injury. This includes supracondylar fracture of the humerus, lateral or medial condyle fractures, lateral or medial epicondyle fractures, radial head or neck fracture and fracture of the olecranon [1,2,3]. A complex injury pattern is rare and this includes Monteggia fracture dislocation and elbow dislocation associated with a fracture of either the lateral or medial condyle or epicondyle representing a more grave injury [4,5,6]. The complex injuries need operative treatment for proper alignment so as to achieve a good result [5,6,7]

In our case the child had sustained a very complex injury pattern. He had an elbow subluxation with fracture of the medial epicondyle of humerus with completely displaced fracture of the radial head with a fracture of the olecranon. Despite an extensive review we did not come across any case report which reported the presence of all these injuries in the same elbow.

The most probable mechanism of injury in this case was a extreme valgus stress 8 on the elbow with a postero-

laterally directed vector force as a result of fall on the outstretched hand. The normal elbow already has a valgus position when a child falls on outstretched hand It leads to extreme valgus This resulted in failure of the lateral column in compression causing a completely displaced and rotated radial head fracture, failure of the medial column in distraction leading to avulsion fracture of the medial epicondyle of the humerus and elbow dislocation. Sometimes the medial epicondyle condyle becomes trapped within the joint. When the forces have more effect on the humerus, the extreme valgus may result in fracture of the lateral condyle. The olecranon fracture was probably a result of sudden contraction of the triceps leading to an avulsion type of fracture of the olecranon.

We operated this complex injury and were able to achieve a satisfactory reduction and post-operative result. We acknowledge that a MRI scan would have been done to show the extent of ligamentous injury in this patient. However this was not possible in our setup due to financial and logistical reasons.

### Conclusion

Complex injuries of the elbow are rare and as per our knowledge the extreme valgus stress injury we have reported here has not been reported in literature earlier [4,5,6,7]. It is essential to identify all the components of injury, delineate all the fractures so as to plan for the appropriate surgical line of treatment. Accurate reduction and fixation is mandatory in such cases to achieve a good functional outcome [2,3]

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Figure-1: Xrays of his Left elbow Antero-Posterior and Lateral view were done. They revealed a complex injury pattern – fracture of the medial epicondyle of humerus with a completely displaced and angulated fracture of the radial neck with a fracture of the olecranon and a dislocated elbow.

Figure - 2: At 3 months post-operatively the Xrays showed a complete union of all the fractures. Implant removal was done at this point

Figure - 3: Radiograph after implant removal. Bones healed with no complications

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Conflict of Interest: Nil  
Source of Support: Nil

How to cite the article:

Sonawane D, Gaikwad Y, Khadilkar M. Complex injury of the Elbow in an 8 years Male child – Extreme valgus stress injury: A Case Report. *Journal of Trauma & Orthopaedics*. Jan-Mar 2015; 10(1):27-29