



Irreducible Anterior Dislocation of the Elbow without associated Fracture

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ABSTRACT

Anterior dislocation of the elbow joint is a rare entity and is usually associated with injuries to surrounding bony and soft tissues. Simple dislocation of the joint is managed conservatively.

An eight years old girl had traumatic anterior dislocation of the elbow joint with intact distal neurovascular status. X-rays showed no associated bony injury. Close reductions failed. Per operative findings showed no intra-articular fracture and the radial head was button holed into the anterior joint capsule. Reduction was achieved openly and maintained in a posterior slab for four weeks. Active and assisted mobilization started after removal of the slab. At ten month follow-up there was almost full range of movement of the joint.

Keywords: *anterior dislocation; elbow; open reduction.*

INTRODUCTION

Traumatic dislocation of the elbow in children is a rare condition.¹⁻³ Most of the dislocations are posterior, but those can occur anteriorly, medially, laterally and rarely divergent dislocation.⁴ It is often occurs as a fracture-dislocation, vascular injuries and compartment syndrome.⁵⁻⁸ Elbow dislocations without associated fracture are termed as "simple" dislocation. Simple anterior dislocation is one of the rare injury and not well described,^{9,10} and reported.

Fall on the back of the elbow with the joint in flexion dislocates it anteriorly.¹¹⁻¹³ The main pathological features are dislocation of humero-ulno-radial joint and stretching of posterior musculo-ligamentous structure and the capsule.^{8,12}

Most of the elbow dislocations can be reduced closely. The primary indications for open reduction are; open dislocation with arterial injuries,³ and inability to obtain a closed reduction.¹⁴⁻¹⁶ Here we report a rare case of

irreducible "simple" anterior dislocation of the elbow joint in a girl treated surgically.

CASE REPORT

Eight years old girl presented to the hospital with complaints of swelling and deformity in right elbow for three days following fall from height. The incidence was not seen by others and the girl did not remember exact mechanism of injury. The girl had stable vitals and had no associated injury. There was no feature of generalized joint laxity. On local examination, attitude of the limb was slight flexion, elbow was swollen, deformed and tender. The relation of three bony points was distorted. Range of motion was painfully restricted with intact neurovascular status of the limb.

Routine hematological and biochemical investigations were within normal limits. Radiograph of the right elbow

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showed anterior dislocation of the elbow joint without fracture of surrounding bones (Figure 1).



Figure 1. Radiographs before reduction. Lateral view showing complete anterior dislocation of the proximal radius and ulna. There is no associated fracture.

Closed reduction was tried twice on emergency basis under general anaesthesia, and with the help of image intensifier. The maneuver was done as recommended by Winslow R¹³ following these steps a) longitudinal traction along the axis of the humerus with the elbow semi-flexed to overcome the forces of the biceps and triceps; b) then the longitudinal force was applied along the axis of the forearm directed toward the elbow by flexing the elbow and pushing the forearm proximally and downward; c) reduction was tried to be accomplished by flexing the elbow and pushing the forearm proximally and downward at the same time. The maneuver was tried twice, but both the attempts were not successful.

Patient was operated on the second day of admission. Boyd and Speed approach was used to expose the elbow joint, radial head and proximal ulna. At surgery, the olecranon and the radial head were dislocated anteriorly and the radial head was button-holed through torn anterior capsule of the elbow joint hampering reduction. However, the annular ligament was slightly stretched but was intact. Part of the capsule was impinged between bony structures laterally. There was no osteo-chondral fracture in the joint. The collateral ligaments were intact.

Impinged part of the anterior capsule was excised, button-holed radial head was released and the joint was reduced under direct vision. Stability of the joint was evaluated after reduction and it was found to be stable. The reduced joint was immobilized internally with trans-olecranon Kirschner-wire at 90° flexion and in posterior slab.

The patient was discharged on 5th day of operation after wound inspection. On two weeks' follow-up, the

wound was healed normally. The trans-olecranon K-wire and sutures were removed, and the elbow was put on posterior slab.

On second follow up (four weeks), the posterior slab was removed. Range of movement of the elbow joint was flexion 40-100°, supination 20° and pronation 15°. Check radiographs showed well reduced joint (Figure 2). Patient was sent for active and assisted active ROM exercises of the elbow.



Figure 2. Radiographs, four months after open reduction, show congruous elbow joint.

In four months post-operative follow up, the ROM of the joint improved. Functionally, she could do almost all her daily activities. The radiographs showed well reduced elbow joint.

At ten months post-operative follow-up she was doing fine functionally. ROM of the elbow joint was almost full, except 20° restriction in extension (Figure 4). Radiographs showed congruous joint (Figure 3).



Figure 3. Radiographs, ten months after open reduction, show normal articulation of the elbow joint.



Figure 4. Photographs, at ten months latest follow up, show excellent range of movement of the elbow joint.

DISCUSSION

Anterior dislocation of the elbow is a rare injury.^{1-3,9,14-16} Bilateral anterior elbow dislocations have also been described in the literature,²⁰ has even been reported after epicondylectomy²¹ and following childhood trauma around the elbow joint.²² The stabilizing structures of the elbow are thought to be as a ring. The posterior column is formed by the olecranon, the triceps, and the posterior part of the capsule. The trochlear notch of the proximal ulna surrounds almost 180 degrees of the trochlea, accounting for a large part of the stability of the elbow joint. Thus, the ulno-humeral articulation has been shown to be the most important stabilizer of the elbow joint.^{1,4} Disruption of relatively stable, posterior stabilizing structures is prerequisite for anterior dislocation of the elbow. This would explain the rarity of this injury.

In most of the reports, anterior dislocation of the elbow was associated with fractures around the elbow and in some cases there was associated neurovascular injury.^{4-7,23-25} In very young children even forceful pull

may cause anterior dislocation of the elbow and is often misdiagnosed as "Pulled elbow".²⁶ Most of the elbow dislocations are reduced closely, however, soft tissue interposition,¹⁴ or buttonholing of the radial head through the capsule can prevent close reduction of it.^{15,16} Our case is a simple or pure anterior dislocation of the elbow joint, surprisingly; close reduction was failed because of buttonholing of the radial head through the capsule of the joint. Annular ligament was intact and there was no evidence of disruption of the medial and lateral collateral ligaments. Takase K et al.¹⁴ from Japan and Aversano F et al from USA¹⁶ reported similar case of reduction failure due to buttonholing of the anterior capsule.

Regarding surgical approach and technique there is no clear recommendation in the literature. We chose the "Boyd and Speed" approach to expose the joint and for better visualization of the articular surface of the joint, radial head and proximal ulna. Reduction of the dislocated joint was possible after excising part of the impinged capsule and release of the button holed radial head. Similar surgical technique was performed to reduce the radial head from the buttonhole.¹⁴

Most authors recommend accelerated functional treatment for simple elbow dislocations, as long periods of immobilization have not been found to be of any benefit.²⁴ In this case also we took out the transolecranon wire after two weeks and posterior slab was removed on fourth week of surgery for the purpose of early mobilization. She had good functional outcome at the time of last follow up after ten months of operation (Figure 4).

In summary, our case report is on one of the rare case, first reported from this region, of simple anterior dislocation from pediatric group which failed close reduction. Open reduction was done and the result after ten months of surgery was excellent.

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