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Case Report

A case of an unusual Monteggia equivalent type II with lateral condyle fracture

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ABSTRACT

Monteggia fracture dislocations are uncommon in childhood. Since the term 'Monteggia equivalents' was termed, various equivalents of this entity have been described. However, these fractures with concomitant elbow injuries are exceedingly rare in young children. We present a case of an 18 month-old girl who sustained a fracture of lateral condyle of right distal end of humerus with posterior dislocation of the elbow. We suggest that the fracture pattern can be included under type II Monteggia equivalent on the basis of its characteristics, biomechanics and the mode of injury with supporting literature review for the same.

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1. Introduction

Injuries with Monteggia fracture dislocations have been challenging in the terms of diagnosis, mechanism of injury, treatment and its outcome. Giovanni Battista Monteggia first observed this entity back in 1814¹ while Bado described 'true Monteggia lesions' and classified them into four types.² He also classified certain injuries as equivalents to the 'true Monteggia lesions' based on their similar radiographic pattern and biomechanism of injury and 'Monteggia equivalent' term was used for these patterns.³ We present a rare case which can be included under type II Monteggia equivalent on the basis of its characteristics, biomechanics and the mode of injury.

2. Case report

An 18 month-old girl, while jumping on the sofa, sustained a fall from a height of about 3–4 feet and landed on her outstretched left hand and sustained an injury to the right elbow. She presented to the emergency department approximately 6 h after sustaining the injury with the complaints of swelling, severe pain and restricted motion of right elbow. On examination, her vitals were stable. Right elbow displayed gross swelling and deformity. Forearm was in the attitude of pronation. Closed injury at the elbow with painful abnormal mobility and crepitus were present. Instability at the elbow was noted. There was no distal neurovascular deficit in the extremity. It was not associated

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Fig. 1 – A and B: Anteroposterior and lateral views of fracture of lateral condyle of distal end of humerus associated with a posterior dislocation of the elbow.

with other significant systemic injury. Roentgenograms showed a fracture of lateral condyle of distal end of humerus equivalent to a Salter Harris Type IV injury through the physis and associated with a posterior dislocation of the elbow (Fig. 1A and B). The patient was treated with an above elbow Plaster of Paris (POP) slab for splintage in the emergency department and the parents were informed that the child would need closed reduction, (or possibly open reduction) and fixation with ‘K’ wires. Under general anesthesia the Lateral condyle fragment was manipulated down to its anatomical position with concomitant reduction of the

Elbow dislocation. After confirming the reduction of joint and fracture fragment, 2 K-wires of 1.25 mm were used to hold the fracture in place and A/E Slab applied for temporary immobilization and prevents joint instability (Fig. 2A and B). Patient was later immobilized in A/E cast for 4 weeks and on regular follow-up to assess fracture position and healing (Fig. 3A and B). Following cast and K-wire removal: radiographs to confirm fracture healing seen in (Fig. 4A and B) show fracture healed in acceptable position. Good range of movement with flexion of 0–100°, full pronosupination and active use of the hand by the child at 6 weeks post

Fig. 2 – A and B: Intra-operative images following reduction, and fixation.

Fig. 3 – A and B: Follow up at 3 weeks post operation.

operatively, on regular follow-up with emphasis for physiotherapy to gain further flexion.

A written informed consent was obtained from the parents authorizing treatment, radiological examination and photographic documentation.

3. Discussion

Monteggia fracture dislocation in a child is an uncommon injury² consisting approximately 1.5%–3% of the elbow

injuries in the childhood. Essentially as described by Bado, the lesion consists of dislocation of the head of the radius with a fracture of ulna at various levels.

Bado also supplemented his classification to accommodate some unusual varieties, which he called 'equivalents' or 'Monteggia like lesions'^{2,3} (Table 1).

In a very young child, inability to elicit precise details of sequence of events⁶ leaves us to postulate the exact mechanism of injury. However, the position of the forearm when the patient is first seen, the position of the distal radius on roentgenograms, provide indirect clues about the mechanism

Fig. 4 – A and B: Final healed fracture at 6 weeks.

Table 1 – Various fracture pattern under Monteggia equivalents^{3–5}.

Type I Monteggia equivalents	Isolated anterior dislocation of radial head (with plastic deformation of ulna) Isolated radial neck fracture Pulled elbow syndrome Fracture of the ulnar diaphysis with fracture of radial neck Fractures of both bones in forearm (wherein, the radial fracture is above the junction of the proximal and the middle third) Fracture of ulnar diaphysis with anterior dislocation of radial head and an olecranon fracture Fracture of ulnar diaphysis (at proximal and middle third junction) with displaced extension type supracondylar fracture of humerus (present case)
Type II Monteggia equivalent	Posterior elbow dislocation in children
Type III Monteggia equivalent	Displaced fracture of the lateral condyle of humerus
Type IV Monteggia equivalent	Distal humerus fracture with proximal third ulnar diaphysis fracture and distal radial metaphyseal fracture with anterior dislocation of radial head

of injury^{3,7,8} and as described by Evans.^{9,10} In our case, the attitude of pronation of forearm with posterior elbow instability probably suggest both of these indirect mechanisms, flexion and hyperpronation, were involved.

The biomechanics of the injury can be believed to be the load transmission from distal to proximal and from radius to ulna across the interosseous membrane.³ The patient having suffered a fall on the outstretched hand, with the continuing hyperflexion force which resulted in the proximal ulna bearing the full weight of the patient, dislocating of elbow joint posteriorly along with continuing hyperpronation force which could have resulted, in the lateral condyle humerus fracture. The excessive forces acting in and around a joint resulting in capsulo-ligamentous and bony failure ultimately presenting as an elbow fracture-dislocation in our case. Instead of the posterior dislocation of the radial head or the radial neck fracture as would be described by Bado as Type II Monteggia Lesion, intact radio-capitellar and proximal radio-ulnar joints moved along with the lateral condylar fragment in the attitude of deforming force.

All the published studies of Monteggia equivalents with ipsilateral distal humerus or intercondylar fractures were described in adults or older children, most of them were compound, were caused by high speed trauma with other significant systemic injuries.³ We describe an unusual case of, a 18-month-old girl, who sustained fracture lateral condyle of humerus with type II Monteggia equivalent based on the fracture characteristics, biomechanics and mode of injury.

Conflicts of interest

The authors have none to declare.

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