



E-ISSN: 2395-1958  
P-ISSN: 2706-6630  
IJOS 2021; 7(3): 378-381  
© 2021 IJOS  
[www.orthopaper.com](http://www.orthopaper.com)  
Received: 07-05-2021  
Accepted: 09-06-2021

**Dr. Vedant Bajaj**  
Post-Graduate Trainee,  
Department of Orthopaedics,  
Regional Institute of Medical  
Sciences, Imphal, Manipur,  
India

**Dr. Suraj Kumar**  
Senior Resident, Department of  
Orthopaedics, Regional Institute  
of Medical Sciences, Imphal,  
Manipur, India

**Dr. Clamson Kamei**  
Post-Graduate trainee,  
Department of Orthopaedics,  
Regional Institute of Medical  
Sciences, Imphal, Manipur, India

**Dr. Nongmaithem Bikananda  
Singh**  
Post-Graduate Trainee,  
Department of Orthopaedics,  
Regional Institute of Medical  
Sciences, Imphal, Manipur, India

**Corresponding Author:**  
**Dr. Vedant Bajaj**  
Post-Graduate Trainee,  
Department of Orthopaedics,  
Regional Institute of Medical  
Sciences, Imphal, Manipur, India

## Monteggia fracture dislocation equivalent in children: A rare case report

**Dr. Vedant Bajaj, Dr. Suraj Kumar, Dr. Clamson Kamei and  
Dr. Nongmaithem Bikananda Singh**

DOI: <https://doi.org/10.22271/ortho.2021.v7.i3f.2773>

### Abstract

Monteggia fractures account for less than 1% of all paediatric elbow dislocations, with a peak age of 4 to 10 years. Although rare, they receive considerable interest because they are often missed, resulting in poor outcomes. There have been numerous reports of Monteggia equivalents including the three most common- isolated radial head dislocation, fracture of the proximal ulna with fracture of the radial neck and both bone proximal third fractures with radial fracture more proximal than the ulnar fracture. We present a case of 6 year old boy with minimally comminuted metaphyseal fracture of ulna extending to proximal diaphysis with anterior dislocation of radial head managed by closed reduction and fixation by percutaneous Kirschner-Wires.

**Keywords:** monteggia equivalents, kirschner-wires

### Introduction

Monteggia fracture dislocations are a rare but complex injury usually involving fracture of the ulna associated with proximal radio-ulnar joint dissociation and radiocapitellar dislocations. These injuries comprise less than 1% of all pediatric forearm fractures and typically affect patients between 4 and 10 years of age<sup>[1]</sup>. Bado developed a classification system for these injuries which is most commonly used but it does not describe the severity of the lesion nor does it have prognostic values.<sup>2</sup> This is a case report of a pediatric patient who sustained a Type I equivalent Monteggia fracture dislocation and described our method of surgical management.

### Case report

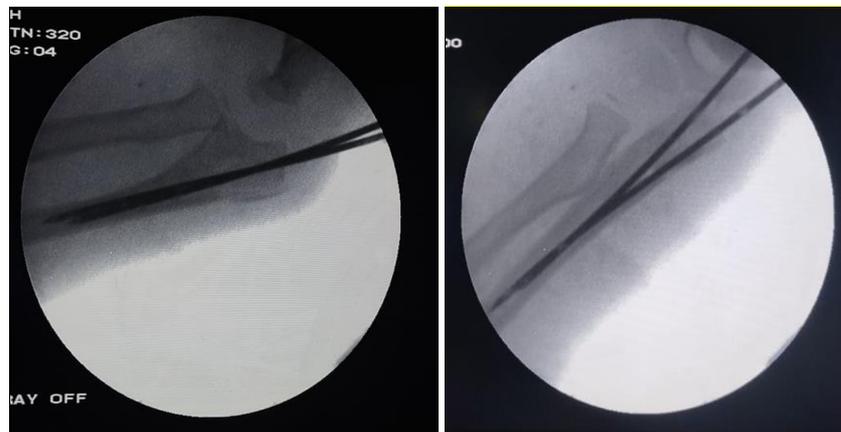
A 6 year old boy presented to emergency department with complains of pain, swelling and deformity of right forearm and elbow following an unwitnessed fall from the bed on the same day. Clinical examination revealed swelling, painfully restricted range of motion without neurovascular deficit. The initial radiograph (Fig 1) of the forearm including elbow in antero-posterior and lateral view showed minimally comminuted metaphyseal fracture of ulna extending to proximal diaphysis with anterior dislocation of radial head which was diagnosed as Bado's Type I equivalent Monteggia fracture. Under sedation with midazolam, closed reduction of proximal ulna fracture and radio-capitellar joint dislocation was attempted which was unsuccessful due to fracture comminution since ulnar length and alignment is crucial for relocation of the radial head. Temporary immobilization was done with an above elbow back-slab.



**Fig 1:** The initial radiograph

The patient was taken up for surgical intervention under general anaesthesia on the following day. Patient was appropriately positioned and upper limb placed over the arm-board. Closed manipulation and reduction was done under fluoroscopic guidance. Two 2mm Kirschner wires were passed percutaneously through the olecranon for the fixation

of proximal ulna fracture followed by spontaneous relocation of radial head as the ulnar length and alignment has been established. Intra-operative fluoroscopic image (Fig 2 and Fig 3) and post-operative X-ray (Fig 4 and Fig 5) shows acceptable reduction.



**Fig 2-3:** Post-operative X-ray



**Fig 4-5:** Shows acceptable reduction.

Post-operatively, the fracture was immobilized with an above elbow plaster of paris back-slab for 3 weeks. The patient was followed up at 1 week and thereafter 2 weekly till 3 months and then once every month. At 1<sup>st</sup> week of follow up, there was no change in alignment of radio-capitellar joint and no neurovascular abnormalities. Assisted range of motion exercises were initiated after 3 weeks and the patient regained

full range of motion of elbow at 6 weeks and wrist with full pronation and 15° lag of supination. At 6 weeks, complete union was obtained clinically as well as radiographically (Fig 6 and Fig 7) and the Kirschner wires were removed. There were no complications like pin-site infection, compartment syndrome, neurovascular injuries etc.



**Fig 6-7:** Kirschner wires were removed

### Discussion

Type I equivalent Monteggia fracture dislocations of forearm are rare injuries. McFarland (1936) has described certain characteristics which distinguish the congenital variety. Traumatic dislocation occurs most commonly in the extension type of Monteggia fracture-dislocation. It has been described as part of complex fracture-dislocations of the elbow joint, and as an isolated injury. Dislocation occurs also in diaphyseal acclasis and dyschondroplasia in association with defective growth of the ulna (Fairbank 1951) [3].

Three separate mechanism of type I Monteggia equivalent dislocation has been described. Speed and Boyd (1940) described that these injuries occurs when a direct blow on the posterior aspect of the forearm first produces a fracture through the ulna. Then, either by continued deformation or direct pressure, the radial head is forced anteriorly with respect to the capitellum causing the radial head to dislocate [4]. Evans (1949) showed that, in the anterior Monteggia injury, forced hyperpronation first ruptures the capsule and annular ligament then fractures the shaft of ulna and finally rotates the head of the radius so that it lies in front of the capsule [5]. Tompkins (1971) proposed that this fracture is a hyperextension injury in which the radial head is dislocated anteriorly by strong contraction of the biceps muscle, the ulna then fracturing largely as the result of a longitudinal compressive force [6].

As long as radial head could be reduced and preserved at this position in Monteggia fracture-dislocations and equivalent lesions of children, conservative treatment is known to be valid. Bado<sup>2</sup> recommends supination manoeuvre and closed reduction in Monteggia Type I equivalent lesions. The pattern of treatment which we have developed depends on the character of the ulnar fracture: Plastic deformation requires

reduction of the ulnar bow under general anaesthesia to achieve stable reduction of the radio-ulnar joint. Incomplete (greenstick or buckle) fractures require closed reduction and casting. Nearly all Monteggia fractures in children (Bado types I and III) are most stable when immobilized in 100 to 110° of flexion and full supination. When faced with a nearly complete greenstick fracture or one associated with a radial fracture (Bado type IV), consideration should be given to operative fixation with an intramedullary K wire, as the reduction may prove less stable with cast immobilization alone in such circumstances. Complete transverse or short oblique fractures are often in bayonet apposition, with malalignment or shortening. Reduction may be difficult and is usually unstable. K wires are useful for obtaining reduction by manipulation of the proximal fragment, and for holding the reduction. Long oblique or comminuted fractures may develop shortening and malalignment even when fixed with intramedullary wires, and we therefore recommend the use of a short plate and screw [7].

In our case, the fracture pattern was minimally comminuted and unstable, we used K-wires to maintain fracture reduction. The radial head was relocated since the ulnar length was maintained.

All patients should also be examined for associated nerve injury, most commonly the radial nerve involving the Posterior Interosseous Nerve. This results in weakness of the wrist and finger extensors, as well as the supinator but no sensory deficit. Fortunately, most nerve palsies associated with Monteggia lesions resolve spontaneously with reduction of the radiocapitellar joint [8].

### Conclusion

Closed reduction with percutaneous K-Wire fixation can be

considered as an effective method of treatment for type I equivalent Monteggia fracture dislocation with minimal comminution. We achieved complete fracture union and the patient achieved good functional outcome (DASH=8) at 6 months of follow up.

### References

1. Shah AS, Waters PM. Monteggia-fracture dislocation in children. Rockwood and Wilkins' Fractures in Children. Philadelphia, PA: Wolters Kluwer 2015, 527-63.
2. Bado JL. 7 The Monteggia Lesion. Clinical Orthopaedics and Related Research (1976-2007). 1967;50:71-86.
3. Hume AC. Anterior dislocation of the head of the radius associated with undisplaced fracture of the olecranon in children. The Journal of bone and joint surgery. British 1957;39(3):508-12.
4. Speed JS, Boyd HB. Treatment of fractures of ulna with dislocation of head of radius:(Monteggia fracture). Journal of the American Medical Association. 1940;115(20):1699-705.
5. Bell Tawse AJ. The treatment of malunited anterior Monteggia fractures in children. The Journal of bone and joint surgery. British 1965;47(4):718-23.
6. Tompkins DG. The anterior Monteggia fracture: observations on etiology and treatment. JBJS. 1971;53(6):1109-14.
7. Ring D, Waters PM. Operative fixation of Monteggia fractures in children. The Journal of bone and joint surgery. British 1996;78(5):734-9.
8. Ha T, Grant S, Huntley JS. Monteggia type IV fracture in a child with radial head dislocation irreducible by closed means: a case report. BMC research notes 2014;7(1):1-5.