

## Monteggia fracture dislocation associated with ipsilateral distal radial metaphyseal fracture. A case report

### Fracture de Monteggia associée à une fracture du radius distal homolatéral. A propos d'un cas

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#### ABSTRACT

The association of a Monteggia fracture dislocation and a lesion of the lower extremity of radius, is very rare and there are few reported cases in the literature. The described injuries in children are Galeazzi fracture dislocation or fracture-separation of the distal epiphysis of the radius. We describe here an exceptional association of Monteggia injury and isolated metaphyseal fracture of the radius in the same forearm in a child of 11 years of age, an atypical type IV of Bado's classification. The treatment was orthopaedic and the result was good at follow-up.

#### RÉSUMÉ

L'association d'une fracture luxation de Monteggia à une fracture de l'extrémité inférieure du radius homolatéral a été rarement décrite dans la littérature. Une fracture luxation de Galeazzi et un décollement épiphysaire du radius distal sont les lésions rapportées chez l'enfant. Nous décrivons dans cette observation une association entre une fracture luxation de Monteggia et une fracture de la métaphyse distale du radius homolatéral chez un garçon de 11 ans. Il s'agissait d'un type IV atypique de la classification de Bado. Le traitement était orthopédique et le résultat était bon au recul.

## I. INTRODUCTION

The association of a Monteggia fracture dislocation and a lesion of the lower extremity of radius, is very rare and there are few reported cases in the literature [1-3]. The described injuries in children are Galeazzi fracture dislocation or fracture-separation of the distal epiphysis of the radius [2, 4, 5]. Combined Monteggia injury and isolated metaphyseal fracture of the radius in the same forearm had never been described.

## II. CASE REPORT

An eleven-year-old boy fell from a height of about one meter and sustained an injury of the left forearm. When the child was firstly seen, he was unable to describe the mechanism of the trauma, but it seems that the forearm was in pronation. He had a severe volar angular deformity in the distal part of the forearm without any neurovascular deficit or cutaneous lesion. Motion of the elbow and wrist was very painful and restricted.

Roentgenograms showed an anterior dislocation of the head of the radius and a fracture of the middle third of the ulnar diaphysis with volar angulation. In addition, there was a fracture through the radial metaphysis with posterior displacement but without dislocation of the distal radio-ulnar joint (Fig 1).



**Figure 1:** Monteggia lesion associated to distal metaphyseal radial fracture

The fracture was manipulated under general anaesthesia and image intensification. An adequate reduction of both fractures was obtained

and the extremity was immobilized in an above-the-elbow plaster cast with the elbow in 90 degrees of flexion and neutral position of the forearm (Fig 2).



**Figure 2:** Osteo-articular reduction under general anaesthesia and immobilization with a plaster cast

The patient remained in the cast for 6 weeks and at the end of this time, bone union had occurred. At 20 months follow-up, there had been no growth disturbance (Fig 3) and the patient had a good function of the wrist and the elbow; pronation and supination were normal.



**Figure 3:** X-Rays at 20 months follow-up: Good bone alignment

## III. DISCUSSION

In 1814, Monteggia described two cases of fracture of the proximal part of the ulna with anterior

dislocation of the radial head [6, 7]. Since then, this type of fracture-dislocation carries the name of Monteggia and many reports of the injury have been published.

In 1967, Bado [8] classified Monteggia fracture-dislocation in four types according to the type of injury to the ulna and location of the radial head. In type I, the anterior dislocation of the radial head is associated to a fracture of the ulnar diaphysis at any level with anterior angulation. In type II, the dislocation of the radial head is posterior or posterolateral and the fracture of the ulna is in the middle or the proximal third of the shaft. Type III associates a fracture of the proximal ulnar metaphysis and a lateral dislocation of the radial head. The association between a fracture of the middle or proximal third of the ulnar shaft and an anterior dislocation of the radial head with a fracture of the middle third of the radial shaft constitute the type IV of this classification.

The review of the literature shows that type I is the most common in Monteggia injury with 60 to 67%. However the type IV is the less common and it accounts for 1 to 5% [6, 7, 9, 10].

In our case the injury could be classified as type IV in Bado's classification with an atypical level of the radial fracture.

Combination of Monteggia fracture dislocation and distal radial extremity injury is very rare in both adults and children [8, 11, 12]. In adults, the rare described cases have been associated Monteggia and Galeazzi injury [1, 2, 13, 14].

In children and in our knowledge, only 3 cases had been reported. The fracture concerned always the epiphyseal plate. However, the distal radial fracture was metaphyseal in our case. It seems to be the first described case of an atypical Bado IV Monteggia injury in children.

It is some times very difficult to determine the exact mechanism of injury in a young child, who is usually unable to provide precise details of the accident. However, the position of the forearm when the patient is first seen, the position of the distal end of the radius on the roentgenograms and the direction of dislocation all provide indirect clues about the mechanism of injury.

The most common mechanism of injury for combined fracture pattern in the forearm is due to fall with the elbow in extension and the forearm in excessive pronation [5].

According to Evans, Monteggia fracture is a pronation lesion of the forearm. When a child falls onto his outstretched hand the forearm is already in pronation, the hand becomes fixed on the ground and the forearm becomes an axe of rotation for the rest of the body. When the normal degree of pronation is exceeded, the ulna first fractures. The continuation of this external rotation leads to a radial head dislocation, then to a fracture in the

upper third of the radial shaft.

In our case, the fracture of the distal radial metaphysis can be explained by an important compression forces applied on the wrist. These forces cause first the fracture of the lower radial extremity and the added rotation of the trunk leads then to a Monteggia lesion.

Because of the high incidence of missed injuries and the severe consequences of a non diagnosed Monteggia lesion, the radiographs must always include the elbow and the wrist joints [15]. Dislocation of the distal radio-ulnar joint must be suspected and researched by the mean of clinical examination and centred radiographs of the wrist [3].

In adults, open reduction and internal fixation of both fracture types was always done for this combined injury. However in children, open reduction has been performed only in unsuccessful closed reduction. In our case, we obtained an anatomical reduction of both fractures under anaesthesia.

The key to good outcome in Monteggia fracture-dislocations is stable anatomical reduction of the ulnar fracture and relocation of the radial head. It is very important that residual angulation or shortening of the ulna be avoided, as this could lead to persistent subluxation or dislocation of the radial head.

In most childhood cases, this can be achieved by closed methods [16]. A good result is generally obtained after 6 weeks of cast immobilisation.

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