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## An unusual Monteggia type 2 fracture

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**Abstract** This paper reports an unusual and undescribed Monteggia variant which was not diagnosed at its initial presentation. An extensive literature search did not reveal any similar case reports. This case report re-emphasises the importance of relying on a line drawn along the neck of the radius on the radiograph, and ensuring that it intersects the capitellum to avoid missing any such rare Monteggia fractures.

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### Case report

A 9-year-old girl presented to the Accident and Emergency Department with complaints of a painful right elbow following a fall onto her outstretched dominant right hand as she was attempting to climb over a 3-foot high wall. She had a flexion deformity of 20° with a further free flexion to 80°. She was reluctant to pronate or supinate her forearm and had some swelling and tenderness over her radial head. She had no distal neurovascular deficit. Radiographs of the elbow revealed an undisplaced fracture of the radial head (Fig. 1). The patient was treated with a polysling and analgesics, and was given a follow-up appointment at the fracture clinic one week later.

When she was seen at the fracture clinic a week later, she had a 30° flexion deformity with free flexion to 90° with pronation of 30° and supination of 50°. The patient was still diagnosed as having a radial head fracture and the polysling immobilisation was continued. She was

however lost to follow-up until her general practitioner referred her back to the fracture clinic 11 months later for a flexion deformity of the elbow.



**Fig. 1** Radiograph of the elbow at the initial presentation



**Fig. 2** Radiographs of the elbow at time of injury with a line drawn at right angles to the radial head. Although the line appears to intersect the capitellum in the anteroposterior view, it runs posterior to the capitellum in the lateral view. This confirms posterior dislocation of the radial head

Her range of movement at this evaluation was flexion/extension of 120°/40° and pronation/supination of 60°/30°; she was pain free. Radiographs of the elbow revealed avascular changes in the capitellum with bony abnormalities of the radial head and neck and a posterior dislocation of the radial head (Fig. 2). It was decided to adopt a nonoperative approach for the next 6 months and to consider elbow arthrolysis in case the range of movement did not improve with time.

## Discussion

A Monteggia lesion, first described in 1814, is a dislocation of the head of the radius associated with a fracture of the ulna. Bado [1] classified this injury and also described the Monteggia equivalent lesions. He described several type 1 injuries, the commonest being fracture of the ulnar diaphysis and fracture of the diaphysis or the neck of the radius proximal to the ulnar fracture without dislocation of the radial head. He also described fractures of the ulnar diaphysis with a fracture of the olecranon and anterior dislocation of the radial head. The other Monteggia variant described was a posterior dislocation of the elbow with a fracture of the proximal ulna, with or without a fracture of the proximal radius. Rodgers et al. [2] found salvage of chronic Monteggia lesions unsatisfactory in their series of 7 patients that required open reduction. Kalamchi [3], described 2 patients with missed Monteggia lesions in whom he successfully carried out an osteotomy of the ulna and open reduction of the radial head. Devnani [4]

described 3 cases with missed anterior Monteggia lesions, successfully treated with open reduction of the radial head, which was held in place with a Kirschner wire passed from the humerus to the radius. Exner [5] described satisfactory reduction of chronic dislocation of the radial head with an ulnar corticotomy and gradual lengthening and angulation of the ulna using an external fixator in 2 cases. Most studies [3, 5–7], however, have shown that when these injuries are recognised and treated immediately, the results are excellent. Lincoln and Mubarak [8] described the ulna bow sign in 1994, in which they emphasized the plastic deformity of the ulna and explained how to make a correct diagnosis from radiographs. The importance of this sign was reiterated in the paper by Kemnitz et al. [9]. However, in the present case, in which there was no bowing of the ulna, this sign would not be pathognomonic.

This case is a useful reminder of the importance of relying on a line drawn proximally along the shaft of the radius on the anteroposterior and lateral radiographs of the elbow and ensuring that it intersects the capitellum to confirm that the radial head is not subluxed, as described by Smith in 1967 [10]. Although the line drawn along the radial neck in the anteroposterior radiograph intersects the capitellum, it clearly runs posterior to the capitellum in the lateral radiograph (Fig. 3).



**Fig. 3a, b** Radiographs of the elbow 11 months later

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Monteggia fractures continue to cause significant diagnostic problems. Early diagnosis is essential to prevent post-traumatic stiffness of the elbow. This paper describes a previously unreported Monteggia type 2 fracture and highlights the diagnostical difficulty with unusual Monteggia fracture variants.

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