Case report

AN UNUSUAL MONTEGGLIA TYPE-I EQUIVALENT FRACTURE IN A CHILD

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A six-year-old girl sustained a Monteggia type-I equivalent fracture of the right forearm. We describe the method of treatment of this rare fracture and its outcome.

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Since the first description of the Monteggia fracture in 1814,1 numerous classification systems have been proposed.2-7 Bado8 was the first to define four types according to the supposed mechanism of injury, and his classification remains the most frequently cited in the literature. It does not, however, describe the severity of the lesion nor does it have prognostic value, and sometimes it is difficult to categorise unusual lesions. We present the case of a six-year-old girl who sustained a rare type-I equivalent fracture and describe our method of operative treatment. In our review of the literature only one other similar injury has been reported.9

Case report

A six-year-old girl was admitted after a fall from a height, landing on her outstretched right forearm. Her elbow was slightly swollen and painful but there were no signs of neurological or vascular injury. After the application of a temporary splint, anteroposterior (AP) and lateral radiographs of the forearm, including the wrist and elbow, were obtained (Fig. 1). An oblique fracture of the ulna at the junction of the proximal and middle thirds was noted associated with an anteriorly displaced fracture of the neck of the radius. The head remained in its normal relationship to the capitellum. We made the diagnosis of a Monteggia type-I equivalent fracture according to Bado’s classification.8

The child underwent urgent temporary percutaneous K-wire stabilisation of the radial head (Fig. 2) followed by closed reduction and transmedullary fixation of the fractures of the ulna and radial neck. The wire which had initially sta-
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The recommended management for most Monteggia and equivalent lesions in children is non-operative as long as the dislocated radial head can be reduced and remains stable. According to Bado, ‘fresh’ Monteggia type-I and equivalent lesions should be treated by closed reduction with a supination manoeuvre. If the radial head is irreducible, or is unstable after reduction, surgical exploration and repair of the annular ligament are indicated as recommended by Tompkins. This procedure may be combined with intramedullary fixation of the ulnar fracture since this provides greater stability of the two lesions. In children the annular ligament is relatively lax. In patients with a Monteggia lesion and fracture of the radial neck this laxity may allow the head to slip posteriorly as pressure is applied to reduce the fracture. In order to avoid this, we temporarily stabilised the radial head in its normal position with a 1 mm K-wire. This also helped us to guide the head during the supination manoeuvres required to reduce the fracture. We then stabilised the radius with a 2 mm intramedullary wire, which just penetrated the growth plate.

Relative laxity of the annular ligament in children makes the type-I equivalent lesion such as we have described, very rare. There is usually a dislocation rather than a fracture of the radial neck and, in addition, the head is unstable. The mechanism of the Monteggia fracture is still a matter of controversy, as is evident from the numerous attempts to describe new classifications. There are three main theories as elaborated by Speed and Boyd, Tompkins and Evans. Bado, like Evans, stated that the mechanism of injury leading to type-I and equivalent lesions was a fall on the outstretched hyperpronated forearm, which was probably the case in our patient. Contraction of the biceps muscle...
during the fall must play some role in the dislocation of the radial head when this occurs. Bado\textsuperscript{8} advised that these lesions should be reduced with slight traction in supination, thereby reversing the mechanism of injury. Regardless of the patient’s age, but particularly in adults, anatomical reduction is required to avoid subsequent loss of function especially if there is an associated fracture of the radial neck.\textsuperscript{13,14} A recent retrospective study showed that the functional result is better in children than in adults.\textsuperscript{13}

In our patient, we believed that there was a significant risk of the radial head displacing posteriorly during reduction if it was not first stabilised within the annular ligament. We also thought that intramedullary fixation was required to stabilise the fracture of the neck and to prevent secondary displacement and a poor functional result. Zimmermann\textsuperscript{14} has stated that this reduces the risk of secondary necrosis of the radial head. At short-term follow-up there was an excellent functional result. In the only other case which we were able to find in the literature, Soin\textsuperscript{9} reported non-operative treatment with a good functional result despite the loss of 20º of pronation.

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References