

Type IV Monteggia fracture in a child

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I describe a type IV Monteggia fracture in a 12-year-old boy with an initial greenstick radial fracture. The concept of a “symbiotic effect” is proposed, wherein single-bone injuries at 2 levels shield each other from excessive damage, and a relatively better outcome than expected is achieved.



FIG. 1. Type IV Monteggia lesion: anterior dislocation of the radial head with fracture of the ulna and the proximal third of the radius. The radial shaft fracture in this case was greenstick in nature and distal to the ulnar fracture.

Case report

A 12-year-old boy suffered injuries to his left forearm and elbow in a fall from a bicycle. Radiographs of the left elbow and forearm revealed a type IV Monteggia lesion (Fig. 1). During close manipulation, the greenstick radial fracture became partially displaced. However, length of the ulna and its alignment together with reduction of the radial head were satisfactorily obtained. Thereafter, the fractures

were splinted in an above-elbow plaster of Paris cast with the elbow in 110° flexion. The radial head reduction was monitored by serial radiography weekly for 3 weeks. After removal of the cast, the limb was actively mobilized. When last seen 2 years after the injury, the boy had painless, normal left elbow function (Fig. 2).

Discussion

Type IV Monteggia lesions are rare injuries



FIG. 2. Anteroposterior (a) and lateral (b) comparative views of both forearms 24 months after fracture, including elbow and wrist joints (affected side is shown on the right). There is excellent healing and radiocapitellar configuration. Note the remodelling at the forearm fracture sites.

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in children, with a reported frequency of about 1%.¹ Previously described cases of type IV Monteggia fractures have shown that the radial fracture is often minimally displaced or greenstick in nature, as in this case.^{1,2} Because the magnitude of force is greater in a type IV Monteggia fracture,¹ it is difficult to explain this greenstick pattern of forearm fractures. The resilience and elasticity of pediatric long bones might be 1 factor. I propose that a symbiotic effect might be functional here. Once the radial diaphysis starts to fracture, it partly dissipates injury energy, and the soft tissues near the proximal radial head are prevented from extreme damage. The radial head, for its part, shields the diaphysis by dislocating and prevents a complete fracture of the shaft. Thus the bones at both sites are protected from extreme individual damage. The symbiotic effect may be seen as a nature's mechanism of compensation for a moderately severe trauma. A similar phenomenon is seen in cases of ipsilateral fractures of the hip and shaft of the femur, whereas a relatively better prognosis is seen for neck fractures compared with isolated neck fractures in adults.³

Type IV Monteggia fractures have been treated by both closed⁴ and open techniques.^{2,5} The presence of the free-floating proximal fragment hampers the ability to carry out a closed reduction of the radial fracture.¹ There is always a risk of displacing greenstick fractures, as happened in this case. More recently there has been a trend toward operative stabilization of these fractures. Opinion varies on fixation of either radius¹ or ulna² alone or both forearm bones⁵ after close reduction of the radial head. I believe that the ulna is the key structure in Monteggia fracture dislocations. Once ulnar length and alignment were restored and the radial head was in place, the radial fracture in our case healed without complication despite partial displacement, .

An analysis of treatment outcomes of type IV Monteggia lesions by various authors¹⁻⁵ reveal that, provided the injury was recognized early and the radial head reduction was obtained and maintained, excellent function was achieved. This is in concordance with the previously described symbiotic effect. I recommend that closed reduction should always be attempted before proceeding to open

reduction and fixation. Because it is a result of high-energy trauma, it is advisable to supervise follow-up in young patients until they are skeletally mature.

Competing interests: None declared.

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