CLINICAL REPORT

Chronic post-traumatic lateral dislocation of the radial head

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Summary
Chronic dislocation of the radial head in children due to undiagnosed Monteggia lesion is uncommon. Although it can initially be asymptomatic, pain, restriction of movement and secondary arthritic changes may develop as the child grows. The treatment of chronic radial head dislocation remains controversial varying from benign neglect to surgical reduction. Only five chronic lateral Monteggia lesions have been described, with variable surgical results associated with redeslocation. A case of chronic post-traumatic lateral dislocation of the radial head in a child treated with ulna osteotomy rigidly fixed and reattachment of the annular ligament is presented. At 2 years follow-up the clinical result was very satisfying and concentric reduction was maintained. The authors conclude this may be an effective procedure for chronic post-traumatic lateral dislocation of the radial head in children.

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Introduction
Chronic dislocation of the radial head in children due to undiagnosed Monteggia lesion is uncommon. Although it can initially be asymptomatic, pain, restriction of movement and secondary arthritic changes may develop as the child grows [1–4]. The treatment of chronic radial head dislocation remains controversial. Some authors propose that the radial head be maintained in the dislocated position, or that it be removed at skeletal maturity [4–7], while others prefer surgical reduction, including combinations of ulnar and radial osteotomies, open or closed reduction, annular ligament reconstruction or temporary fixation with transarticular wire [6–10].

Bado type III, the lateral variant of Monteggia fracture-dislocations, is a more rare type. Only five chronic cases of this variant have been described, and surgical correction provided conflicting results with redislocation being the main concern [1,6,10].

We present a case of chronic post-traumatic lateral dislocation of the radial head in a child treated with ulnar osteotomy internally fixated and reattachment of the annular ligament.

Case report
A young male, aged 2 years 10 months, sustained a left elbow injury, initially interpreted as a simple ulna fracture, which was immobilized in a splint for 4 weeks. Revising the child at
6 weeks, an elbow deformity (Fig. 1) was apparent, although movement was almost unrestricted and painless. Radiographic study revealed a meta-diaphyseal varus deformity of the ulna associated with lateral dislocation of the radial head (Fig. 2). A surgical correction was proposed and done at 8 weeks. Through a Boyd approach a valgus ulnar osteotomy was performed, allowing the radial head to easily reduce, and was then fixed with a molded plate and screws (2,3 Ø titanium fixation plate, Leibinger, Stryker). The remnants of the annular ligament were reattached and secured with a bone anchor (Mini Quick Anchor, DePuy Mitek) (Fig. 3). A posterior plaster splint in 90° flexion and neutral rotation was maintained for 1 week after which rehabilitation was initiated. At 2 years post-op the elbow presents a correct contour, movement is almost unrestricted and painless and reduction is maintained (Figs. 4 and 5).

Discussion

Monteggia first described ulna fracture associated with radial head dislocation in 1814 [3]. In 1967, Bado classified these lesions in four types according to location, ulna angulation and position of the dislocated radial head [11]. Type I fracture-dislocation with anterior radial head and ulna angulation is the most frequent.

Treatment in the acute phase is straightforward, but controversy persists with respect to the chronic phase, that is, 30 days after the initial lesion [3,6,7,10]. It has been suggested that factors such as patient’s age and time from injury may affect surgical result [2,4,6,8].

Some authors recommend that the radial head be maintained in the dislocated position, or that it be removed at skeletal maturity in case of pain or functional limitation [4,6,7,9,12]. Early excision of the radial
Chronic post-traumatic lateral dislocation of the radial head

Figure 4  Range of motion at final follow up.

Figure 5  Radiographic result at final follow up.

head is not recommended for the treatment of children [5,13].

Others would propose surgical intervention due to early and late complications, which include pain, angular deformity, decreased range of motion and dysplastic and arthritic changes not only on the proximal radioulnar joint but the distal humerus as well [1–4,13]. Surgical reconstruction is also prone to complications and thoughtful consideration of conservative treatment must be taken before proceeding with surgery [13].

Long standing dislocations may prevent good results due to dysplastic changes of both the radial head and the capitellum [4,8]. Still Horii et al. state that dislocations that are seen within a year after injury can be successfully reduced regardless of the patient’s age [2]. Freedman et al. showed that a good surgical result can be achieved several years after the injury, even when radial overgrowth has occurred [14]. Hasler et al. described good results in 15 patients who underwent ulnar osteotomy, external fixation and open reconstruction of the elbow joint without repair of the annular ligament between 2 months and 7 years after the initial accident [8]. However only patients with a radial head of normal shape were selected for treatment by this method since they believe that dysplastic changes of the radio-capitellar joint render successful surgery unlikely.

In 1993, Oner and Diepstraten described two cases of chronic post-traumatic lateral dislocation of the radial head. Both had annular ligament reconstruction and no osteotomy. Although the immediate result was good both redislocated in the follow-up, which led them to recommend osteotomy in anterolateral dislocation [1].

Inoue and Shionoya report they had two cases of lateral dislocation in their series but provide no results of the treatment [6]. Only one other case has been reported since then and an excellent result was achieved with surgery [10].

In lateral dislocation the radial head does not impinge on the anterior humerus so range of motion is nearly not affected. Clinically the main concern is deformity and evolutionally pain. Ulnar nerve palsies are also at least a theoretical late complication [13,15]. Nevertheless we believe that on the long-term dysplastic changes will probably develop and that early reduction should be performed.

Ligament reconstruction without osteotomy has been proposed by many authors [1,16–18]. However avascular necrosis of the radial head, osteolytic changes, narrowing or growth disturbance of the radial neck and restricted range of pronation-supination are reported complications of this procedure [1,5,19–20].

In our view the ulna osteotomy as near as possible to the apex of the deformity is an essential step in the correction of these lesions and should by itself easily reposition the radial head, rendering the reduction stable, as demonstrated earlier [6,7]. Rigid fixation allows precise angulation at the osteotomy site and early mobilization, which may minimize contractures [2,8,9,13].

Remnants of the annular ligament were found and reattached with a bone anchor providing additional stability to the reduction [7]. Transarticular wires and its known complications such as migration, infection or breakage were avoided and early mobilization was possible.

At follow-up the clinical result was very satisfying and concentric reduction was maintained.

We conclude that ulna osteotomy rigidly fixated and ligament reattachment may be an effective procedure for chronic post-traumatic lateral dislocation of the radial head in children.

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Conflict of interest statement

Nothing declared.

References