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Case Report

Isolated anterior dislocation of the radial head (case report)

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ABSTRACT

We report the case of an isolated post traumatic radial head dislocation in a 5 year old child. Clinical examination and the X ray results allow the diagnosis which can be unnoticed. The reduction by external maneuvers avoids the surgical treatment which remains the gold standard for chronic dislocation.

Introduction

Isolated anterior dislocation of the radial head is exceptional. It is often described in the context of a fracture dislocation of Monteggia combining a fracture of the diaphysis of the ulna and a dislocation of the radial head. When it is old, it poses a problem of differential diagnosis with congenital dislocations. We report the case of an isolated anterior post-traumatic dislocation of the radial head in a child.

Case presentation

It was a young child aged five, right-handed, who, following an indirect trauma; fall on the palm of the right hand, elbow extended-hyper pronation; presented to the emergency room with painful total functional incapacity of his right elbow.

The clinical examination revealed a swollen and painful elbow, a blockage of pronosupination, a significant limitation of flexion and extension compared to the contralateral side, the anatomical landmarks of the elbow were preserved and there was no vascular-nervous disorders.

The frontal and lateral X-ray of the elbow as well as the ipsilateral forearm X-ray carried out in emergency revealed an isolated anterior dislocation of the radial head without other bone lesions in particular; the absence of fracture of the diaphysis of the ulna (Fig. 1).

The dislocation was urgently reduced under general anesthesia using external maneuvers. The elbow was then immobilized in a brachioantibrachial cast with the forearm in complete supination for four weeks. The control radiograph showed a radial head in place (Fig. 2).

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At 1 year post-traumatic follow-up, the child presents a clinical examination without abnormalities with complete flexion and extension and complete pronation-supination, the elbow x-ray shows a radial head still in place without ulnar fracture or associated deformity (Fig. 3).

Discussion

Isolated anterior post-traumatic dislocation of the radial head is a rare entity [14], generally described in the context of a Monteggia fracture dislocation. The literature review shows that few studies of isolated anterior dislocation of the radial head have been reported [1–4]. For some, it does not exist and considers it as an equivalent of fracture dislocation of Monteggia [5,6]: dislocation of the radial head associated with a plastic curvature of the ulna. Vesely [3] assumes the presence of an occult fracture of the ulna which has gone unnoticed.

There is controversy regarding the mechanism of injury. Salama and al [10] reported a case of isolated anterior dislocation following an electrocution accident. For Evans [8] and Vesely [3], the dislocation is the result of a mechanism of forced supination applied to a hyperextended elbow. For Hamilton [5], it is a mechanism in forced supination, elbow in hyper extension.

Anatomically, Wiley and al [7] were able to show, in a cadaver study, that dislocation of the radial head cannot occur without damage to the annular ligament, the main stabilizer of the radial head. Gleason [11] reports a tear of the square ligament of Dénuce, the lower reinforcement of the anterior capsule, the second stabilizer of the radial head. However, a tear of the proximal part of the interosseous membrane was necessary for its realization.

In our observation, the mechanism of injury is hyperpronation on the elbow in extension (Fig. 4).

The clinical examination is not specific and reveals the notion of trauma with a fall, associated with functional impotence of varying importance with or without local edema. It makes it possible to eliminate painful pronation which occurs in young children whose diagnosis is clinical (circumstances of occurrence, absence of notion of fall, simple manual reduction with almost immediately appreciable effectiveness).

Frontal and lateral x-rays of the elbow and the entire forearm are essential to establish the diagnosis. They make it possible to objectivize the presence of hemiarthrosis, the integrity of the bony structures of the elbow joint and to eliminate the main differential diagnoses of elbow trauma in children, namely: fracture or epiphyseal separation, of the radial head, fracture of the external condyle, fracture of the humeral paddle (Fig. 5).

The treatment of recent dislocation of the radial head is closed reduction under general anesthesia, followed by immobilization with a brachioantibrachial cast, elbow flexed to 90° and forearm in forced supination for three to six weeks [3,5]. In our case the patient was immobilized for 30 days.

The reduction maneuver combines traction in the axis with forced supination of the forearm and direct pressure on the radial head. However, Neviasser [12] reported failure to reduce a fresh dislocation by external maneuver. Intraoperatively, interposition of the joint

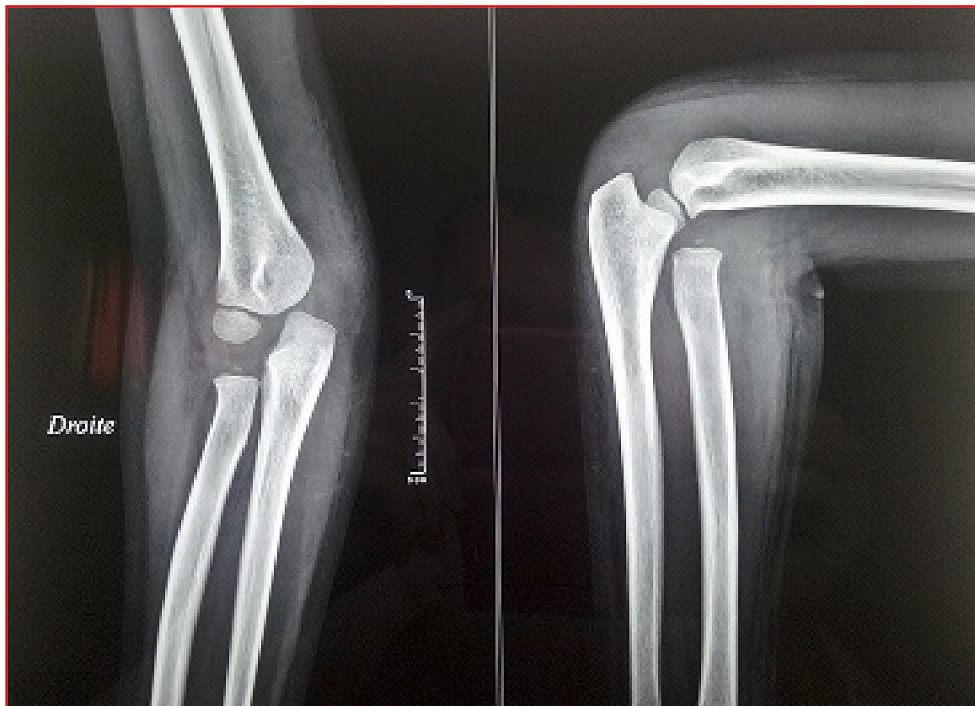


Fig. 1. Frontal and lateral radiograph showing an isolated anterior dislocation of the radial head.

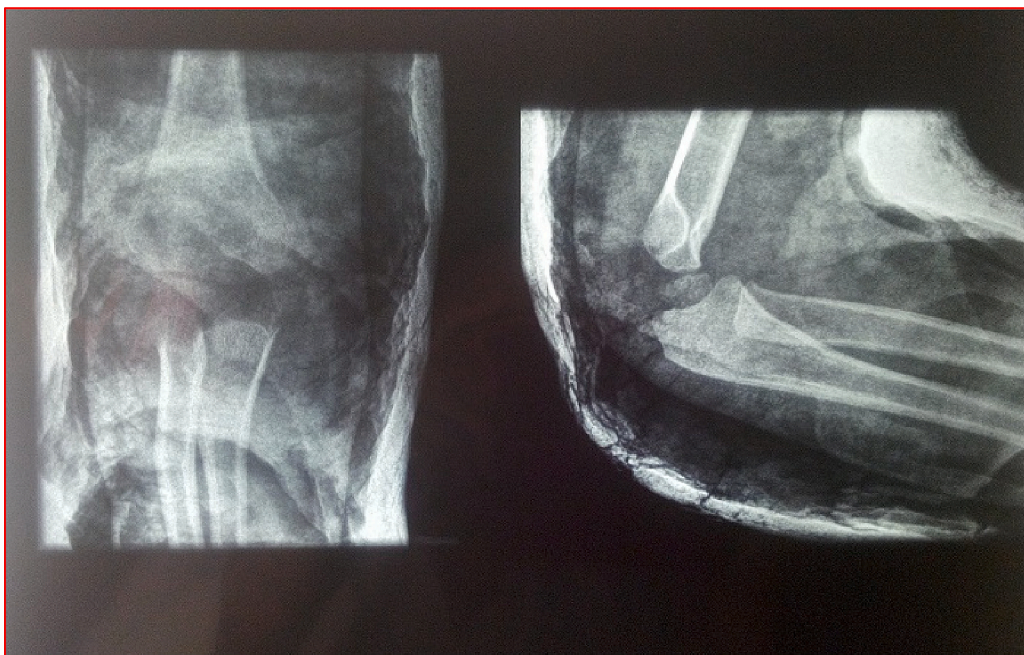


Fig. 2. Frontal and lateral radiograph showing a radial head in place after closed reduction under GA.

capsule was the main cause of this failure. On the other hand, in a case reported by Veenstra and Van der Eyken [13], the irreducibility was due to biceps interposition.

Beyond three weeks, we speak of chronic dislocation, reduction by external maneuvers is impossible and open reduction is the treatment of choice [9]. The most commonly used technique is currently a reduction of the dislocation associated with a flexion osteotomy of the ulna and a reconstruction of the annular ligament.

The postoperative functional prognosis is variable but seems to be related to the age of the dislocation and the type of surgical intervention.

Conclusion

Isolated anterior traumatic dislocation of the radial head is exceptional, sometimes going unnoticed, it must be considered in the face of any acute trauma to the elbow. Radiographic images of the elbow face and profile and images of the ipsilateral forearm as well as radiographs of the contralateral elbow allow the diagnosis and type of dislocation to be made. For acute forms, the treatment is orthopaedic, while in neglected forms surgery is the treatment of choice.

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Consent for publication

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CRedit authorship contribution statement

ZIED MANSI: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology. **Chamakh Mohsen:** Investigation, Methodology, Resources, Visualization. **Saadana Jacem:** Methodology, Resources, Software, Supervision, Writing – original draft. **Chermiti Wajdi:** Software, Validation, Visualization, Writing – original draft. **Zaidi Bacem:** Software, Validation, Visualization, Writing – original draft. **Haggi Ali:** Investigation, Methodology, Resources, Validation, Visualization.

Declaration of competing interest

The authors confirm that they have no conflicts of interest associated with this publication.



Fig. 3. Lateral radiograph showing a radial head in place one year postoperatively.

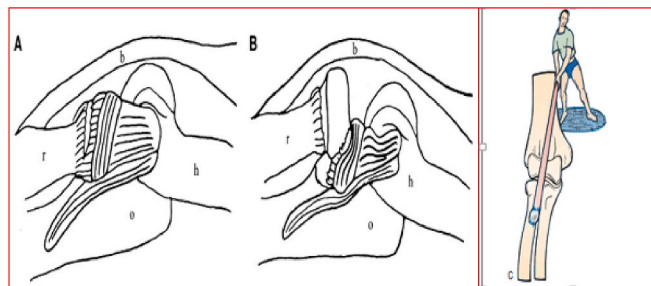


Fig. 4. HAS: representation schematic of the mechanism of anterior dislocation of the radial head, elbow in hyperextension. B: the radial head is dislocated forward under the effect of the force exerted by the tendon of the biceps muscle. b, biceps tendon; h, humerus; o, olecranon r, radius.

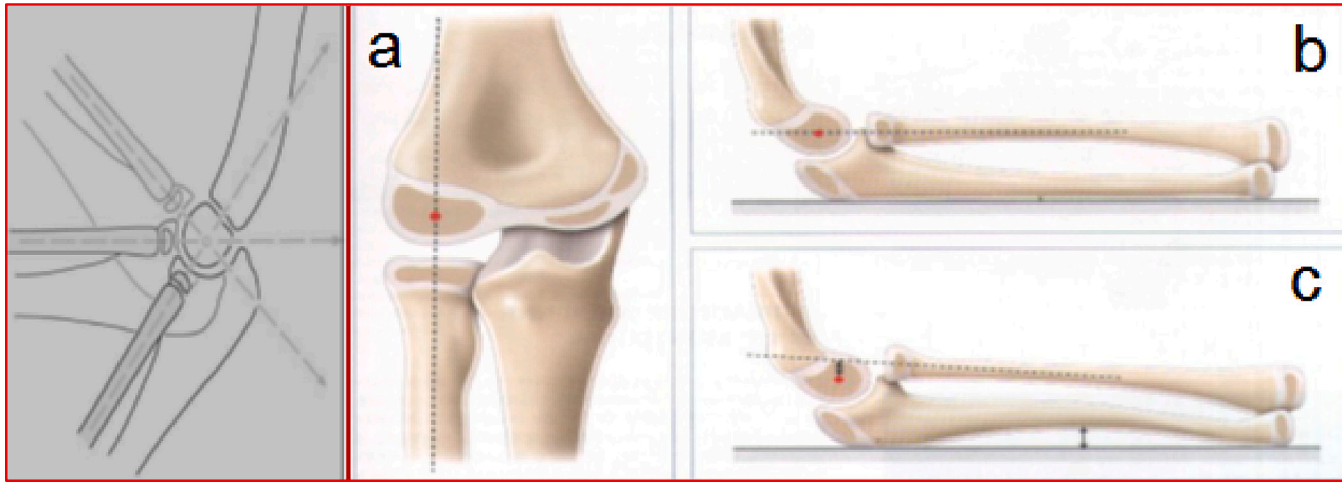


Fig. 5. Principles of interpreting an x-ray of the elbow in children (anatomical landmarks). (a) Frontal x-ray: performed with the wrist supinated. Under normal conditions, the axis of the radius passes through the body of the radius and the center of the condylar epiphysis (a). *Bone continuity is respected. (b) profile x-ray: performed with the elbow flexed at 90° and the wrist supinated. The axis of the radius passes through the center of the condylar epiphysis (b). The humeral line intersects the posterior two-thirds of the condylar epiphysis (b) In the context of an isolated dislocation of the radial head, the lateral image shows a deviation of the radial axis in relation to the condylar epiphysis (c). Comparative photographs must be taken systematically in case of doubt.

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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