

# ISOLATED POSTERIOR DISLOCATION OF THE RADIAL HEAD WITHOUT FRACTURE OF THE ULNA IN A CHILD

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**An isolated posterior dislocation of the radial head is a rare injury. We present a case report on an 11-year-old boy with a traumatic posterior radial head dislocation without fracture or bending of the ulna. The diagnosis can be difficult and should be supported with good radiographic images, since clinically the injury can be missed or misdiagnosed.**

**Keywords :** posterior dislocation ; radial head ; child.  
**Mots-clés :** luxation postérieure ; tête radiale ; enfant.

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## INTRODUCTION

An isolated dislocation of the radial head is considered to be a rare injury (2, 3, 9). The dislocation can be either anterior, lateral or posterior, the latter being less frequent (2, 5). An isolated radial head dislocation should be differentiated from a "pulled" (or "nursemaid's") elbow, a congenital dislocation of the radial head and a radial head dislocation associated with a fracture of the ulna (Monteggia's fracture) (3, 6, 8).

## CASE REPORT

An 11-year-old boy presented at the emergency department with a painful left elbow, held firmly in a slightly flexed and supinated position. He stated he had felt a sudden sharp pain while getting up from the floor, leaning upon a pronated and slightly flexed arm. No violent contact was noted.

On examination all movements were restricted, especially rotation which was very painful. In the posterolateral cubital region a hard swelling could

be palpated, which was identified as the dislocated radial head. No other clinical signs indicative of a possible fracture were present.

The radiographs revealed an isolated posterior radial head dislocation, without the presence of a fracture, bending or congenital malformation of the ulna. Because of pain in positioning the arm it was difficult to obtain strict anteroposterior and lateral views (figs. 1 and 2).

Immediate reduction under general anesthesia was performed by gentle traction on the slightly flexed arm followed by pronation. The reduction proved to be stable and a plaster cast was applied for three weeks. After that exercises were started, and the patient regained full mobility in the elbow joint.

## ANATOMY AND TRAUMA MECHANISM

The most important structure maintaining the radial head in its anatomical position is the annular ligament, which encircles the head and the neck of the radius, and is attached to the anterior and posterior margins of the ulnar notch (12). The interosseous membrane stretches between the internal borders of radius and ulna. It is slack in pronation of the forearm and thus allows the radial head to sublux in that position ; it tightens again in supination (12).

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*Fig. 1.* — Slightly rotated AP-view of the dislocated radial head.

The quadratus ligament, the radial collateral ligament and the oblique cord have no important function in stabilizing the radial head (12).

Based on cadaveric studies a possible mechanism for dislocation has been proposed (12). Forced pronation of the forearm and varus strain at the elbow in slight flexion produces lateral dislocation of the radius with rupture of the annular ligament and the quadratus ligament (5, 10, 12). With the radial head dislocated laterally, supination of the forearm either reduced the radial head in its anatomical position or forced it posteriorly in a dislocated position (12).



*Fig. 2.* — Slightly rotated lateral view of the dislocated radial head.

## DIAGNOSIS

In the acute stage the patient with a dislocated radial head usually presents with a painful swollen elbow, while guarding against any movement (12). Passive motion may be surprisingly free in flexion and extension (5), but is limited in pronation and supination (1, 10, 12). The clinical presentation is not always obvious (9), and the diagnosis can be easily missed (3). A relatively minor trauma can cause the injury (5, 9).

In a posterolateral dislocation an abnormal bulge is seen on the lateral side of the elbow (12).

Good radiographic images should lead to the correct diagnosis (3, 11). Both in the anteroposterior and lateral views, a line drawn through the long axis of the radial shaft should always pass through the center of the capitulum, irrespective of the degree of flexion of the elbow (3, 5, 10). In a posterolateral dislocation this line will fall posterior to the capitulum in a lateral view, and laterally on the anteroposterior views (9). Arthrography may be used to differentiate between congenital and traumatic radial head dislocation, the latter being an extra-articular lesion, as opposed to intra-articular in the congenital dislocation (7).

### TREATMENT

Serious complications, such as limitation of motion, chronic recurrent dislocations, permanent deformity and neurological deficits, can occur if a radial head dislocation is not treated promptly (3). Hence, a closed reduction should be performed immediately (2, 3), and it is generally successful (11).

In posterior dislocations of the radial head, reduction should be performed by traction on the forearm together with pronation, thus levering the radial head into the elbow joint (10). The elbow should then be immobilized with the forearm in midposition and the elbow flexed at a right angle (10).

If repositioning is not possible on a first attempt, a second attempt should be made (10). If closed reduction fails, open reduction has been recommended with or without repair of the annular ligament (2, 3, 10).

Management of the patient whose diagnosis has been delayed by more than three weeks is controversial (2), especially if he is asymptomatic (6, 10). The reconstruction of the annular ligament might not be sufficient to prevent recurrent dislocations (2, 4). A range of ulnar and radial osteotomies have been proposed in order to maintain the reduced position of the radial head (2, 4, 8, 11).

Pain, loss of motion and cosmetic problems may be considered as reasons for excision of the radial head (1).

Resection of the radial head in growing children should not be performed because of the risk of secondary subluxation of the distal radioulnar joint, owing to proximal migration of the radius (6), and increasing valgus deformity and instability (6).

### CONCLUSION

Isolated radial head dislocations are rare injuries, often following minor trauma.

The clinical presentation is one of a painful elbow, with restriction mainly of pronation and supination. The diagnosis is not always obvious, therefore a high index of suspicion and good radiographic images are imperative. The annular ligament is the most important structure maintaining the radial head in place.

The mechanism is a forced pronation of the forearm together with varus stressing of the elbow, followed by a hyperextension, forcing the radial head posteriorly. The treatment of choice is a prompt reduction under general anesthesia followed by three weeks of plaster immobilization.

Several operative techniques have been described in the case of delay in the diagnosis, but these are not commonly accepted.

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### SAMENVATTING

*E. WOUTERS, Y. FORTEMS, E. MULIER, J. STUYCK en G. FABRY. De geïsoleerde posterieure radiuskopluxatie zonder fractuur van de ulna bij het kind.*

Een geïsoleerde radiuskopluxatie is een zeldzaam voorkomend letsel.

De auteurs beschrijven het geval van een elfjarige jongen met een traumatische posterieure radiuskopluxatie zonder begeleidende fractuur van de ulna.

Het stellen van de diagnose kan moeilijk zijn, en dient ondersteund te worden met goede radiografieën, aangezien het letsel bij het klinisch onderzoek gemakkelijk kan miskend worden.

Een reductie onder algemene anesthesie dient onmiddellijk uitgevoerd te worden.

Bij langdurig bestaande luxaties kunnen heelkundige correcties uitgevoerd worden, doch hierover bestaat geen eensluidendheid.

Het mechanisme van de luxatie en de anatomie worden besproken.

### RÉSUMÉ

*E. WOUTERS, Y. FORTEMS, E. MULIER, J. STUYCK et G. FABRY. La luxation traumatique postérieure isolée de la tête radiale, sans fracture associée du cubitus, chez l'enfant.*

La luxation isolée de la tête radiale est peu fréquente. Nous présentons le cas d'un garçon de onze ans, présentant une luxation postérieure traumatique de la tête radiale sans fracture ou déformation du cubitus. Le diagnostic peut être difficile et doit être confirmé par de bons clichés radiographiques, car l'affection peut être méconnue lors de l'examen clinique.

La réduction immédiate sous anesthésie générale est indiquée.

En cas de diagnostic tardif, une intervention correctrice, qui ne fait pas l'unanimité, peut être indiquée.

Le mécanisme du traumatisme ainsi que l'anatomie de la région sont décrits.