

# Isolated Posterior Dislocation of the Radial Head in the Adult: An Injury not to be Missed

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## Abstract

## Case Report

**Introduction:** Isolated radial head dislocation in the adult is a rare and frequently missed traumatic injury. It is most commonly seen in children as a radial head subluxation. It should be diagnosed and treated without delay to avoid long-term sequelae to the joint. **Case Presentation:** A 22-year-old male presented to the Emergency Department complaining of persistent pain in his right elbow after a fall one week before. He had been diagnosed with an elbow sprain and arrived to our hospital using an above-elbow cast placed. The radiological evaluation revealed a posterior dislocation of the radial head without associated fractures. The patient was submitted to closed reduction followed by a cast immobilization. The follow-up weeks later showed a full and painless elbow range of motion. **Discussion:** Isolated posterior dislocation of the radial head in the adult is an infrequent injury, with only a few cases described in the literature. Therefore, a delay in diagnosis of a traumatic radial head dislocation in the absence of a concurrent ulnar fracture may occur. The case presented illustrates how easily the injury can be missed in the first medical evaluation. It also shows how a timely closed reduction can reestablish the joint's full range of motion. Delay in treatment usually requires open reduction and may result in a poor functional outcome. **Conclusion:** A high index of suspicion is essential for the diagnosis of isolated posterior dislocation of the radial head. This clinical case demonstrated that early diagnosis and prompt treatment can successfully repair the injury and prevent functional disability of the elbow joint. **Keywords:** Isolated Adult Radial Head Dislocation, Radial Head Posterior Dislocation, Proximal Radioulnar Joint, Elbow Dislocation.

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## INTRODUCTION

Radial head subluxations or dislocations rarely present without an associated fracture or elbow dislocation in adults [1-3].

Isolated radial head subluxation is the most common upper extremity traumatic injury in children younger than five years old ("nursemaid's elbow"). [1].

Anterior radial head dislocation is the most common form of isolated traumatic dislocation of the elbow in adults. [3].

Isolated posterior dislocation of the radial head in the adult is a frequently unrecognized diagnosis at the time of the injury. If missed at the initial presentation, joint stiffness and secondary degenerative arthritis of the elbow can develop later on. [4].

We present a case of a 22-year-old man who fell during holidays overseas and presented to us with a diagnosis of "elbow sprain".

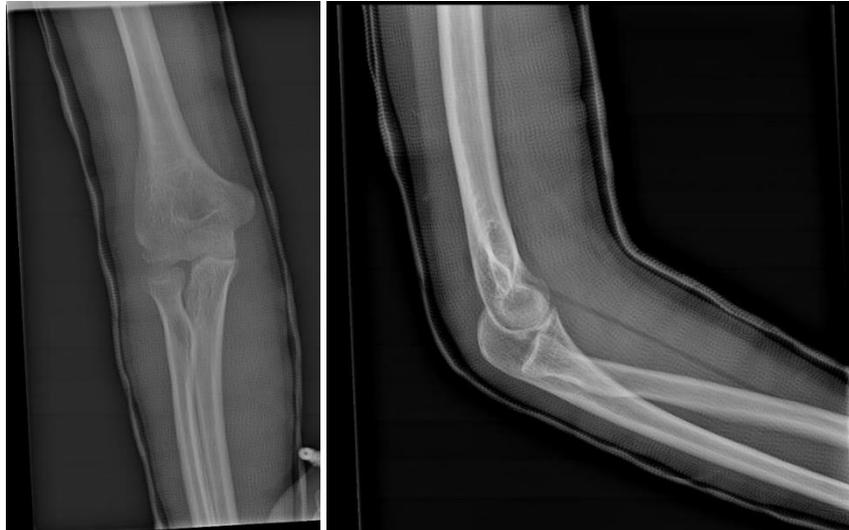
## CASE PRESENTATION

A 22-year-old male student presented to the emergency department with pain and disability of his right elbow. He reported having fallen over the edge of a swimming pool onto an outstretched arm one week before during overseas holidays. The diagnosis he had received was an "elbow sprain", and an above-elbow cast had been placed and he was instructed to rest and use an arm sling.

When assisted by our team, the physical examination showed a swollen elbow without signs of joint effusion. There was tenderness on the lateral aspect of the elbow. The patient was able to do active flexion and extension but he had complete loss of pronation and supination movement.

A radiographic evaluation of the elbow was requested with the above-elbow cast (figure 1). It revealed posterior dislocation of the radial head. A Computed Tomography (CT) scan of the elbow joint

was performed to rule out associated traumatic injuries (figure 2 and 3). The definitive diagnosis was then established: isolated posterior dislocation of the right radial head.



**Figure 1: Pre-reduction posteroanterior (left) and lateral (right) elbow radiograph showing a posterior dislocation of the radial head**



**Figure 2: Coronal cut CT scan at the level of the radiohumeral joint**

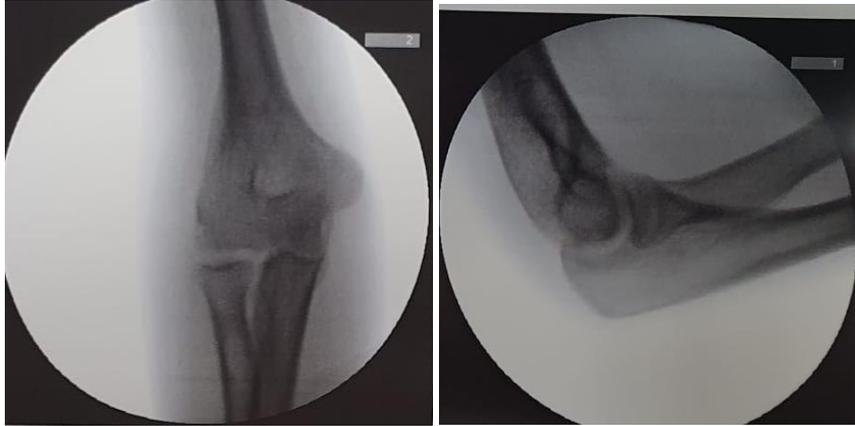


**Figure 3: Three-dimensional CT reconstruction of the right elbow showing posterior dislocation of the radial head**

The anaesthesiology team was called to assist in the attempt of closed reduction, and the patient was administered sedation in the operating room.

The dislocation was reduced without touching the joint: a movement of hyperpronation and gentle

traction was made. The successful reduction was confirmed by intra-operative radiography (figure 4). The joint was then tested for flexion-extension and pronation-supination and showed stability for every of these movements.



**Figure 4: Intraoperative post-reduction posteroanterior (left) and lateral (right) elbow radiograph showing reduction of the radial head**

After the joint stability was tested, a posterior plaster immobilization was placed with the elbow in a flexed and supinated position. Our patient had it for 14 days.

At 3 months follow-up, the result was excellent. The patient regained full range of motion and returned to his study course. There was no instability or pain.

## DISCUSSION

Scientific evidence on biomechanics of the proximal radioulnar joint is scarce. [3]. The annular ligament is the primary stabilizer of the proximal radioulnar joint.[5] This ligament is part of the lateral ligament complex of the elbow, which comprises the annular ligament, the radial collateral ligament and the lateral ulnar collateral ligament. Although the annular ligament is crucial to the stability of the proximal radioulnar joint, other structures such as the quadrate ligament and the interosseus membrane play an important role in the stability of joint.

In early childhood, longitudinal traction applied to the hand with the elbow extended and forearm pronated can lead to subluxation of radial head by interposition of the annular ligament between radial head and capitellum. After the age of 5 years old, subluxation is prevented by a thicker and stronger distal attachment of the annular ligament.[1]

Therefore, most cases of isolated subluxation of radial head occur in children from 1 to 4 years old. In adults, it is more commonly associated with an ulnar fracture (Monteggia fracture). This combination accounts for less than 2% of all forearm fractures. [6].

Isolated dislocation of the radial head without concomitant ulnar fracture or humeroulnar subluxation in adults is a rare injury. [7].

The mechanism behind this lesion is predominantly an indirect trauma. Cadaveric studies demonstrated that posterior dislocation of the radial head cannot occur without the rupture of the annular ligament. Also described is a partial tear of the quadrate ligament and of the proximal interosseus membrane. [8].

The most likely mechanism in our patient was a hyperextension of the elbow with the forearm in a prone position, which caused a posterior dislocation of the radial head.

If diagnosed in the acute setting, most cases can be reduced through external manipulation, as happened with our patient.

After closed reduction of isolated posterior radial head dislocation, most authors propose immobilization of the elbow in flexion and supination in a plaster cast, while others report success with immobilizing in the flexed and pronated position. [9]. Nevertheless, the period of immobilization after closed reduction should be of 10 to 15 days. In the long-term, the functional outcome after a successful closed reduction is very satisfactory.

If closed reduction doesn't achieve a stable joint, open reduction with either an annular ligament reconstruction or a radial head excision [10] may be needed. The functional result after an open surgery is

usually poor and can lead to degenerative arthritis of the elbow and of the distal radioulnar joint.

## CONCLUSION

Isolated posterior radial head dislocation in the adult is a rare traumatic injury. It should be suspected if the patient presents with an inability to pronate/supinate while being able to flex the elbow.

The diagnosis may be easily missed on the initial radiographs as this clinical case illustrates. A high index of suspicion is needed. As the injury of our patient was recognized in the acute context, closed reduction followed by a period of immobilization resulted in a fully functional joint.

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