

Radial Head Dislocation with Elbow Subluxation in an Adult

Amanda L. Webb¹, Mary C. Slome¹, Ayanna Walker¹, Latha Ganti²

1. Emergency Medicine, University of Central Florida College of Medicine / Hospital Corporation of America Graduate Medical Education Consortium of Greater Orlando, Orlando, USA 2. Emergency Medicine, Envision Physician Services, Orlando, USA

✉ **Corresponding author:** Amanda L. Webb, mannie.webb@gmail.com

Disclosures can be found in Additional Information at the end of the article

Abstract

Isolated radial head subluxation without fracture, commonly referred to as “nursemaid’s elbow,” is one of the most common pediatric upper extremity injuries. Radial head dislocation without an associated fracture is rarely seen in adults. They are usually associated with ulnar fractures or an elbow dislocation. We present a case of an adult female presenting with a radial head dislocation and an elbow subluxation sustained while dressing, which was successfully reduced using the techniques commonly used to reduce nursemaid’s elbow in pediatric patients.

Categories: Emergency Medicine

Keywords: radial head dislocation, elbow subluxation

Introduction

Isolated radial head subluxation, also referred to as “nursemaid’s elbow” or “pulled elbow,” is the most common upper extremity injury in children younger than six years old, peaking at two to three years [1-3]. Roughly half to two-thirds of the cases are caused by the classical mechanism of axial traction applied to the forearm (pulling), allowing the annular ligament to slip and become entrapped between the radial head and capitellum [2-6]. Radial head subluxations or dislocations rarely present without an associated fracture or elbow dislocation in adults [7-9].

Case Presentation

A 43-year-old female with a self-reported history of prior elbow dislocations presented to the emergency department with pain, deformity, and decreased range of movement in her elbow after dislocating her elbow while dressing. Unlike her prior dislocations, she was unable to reduce it herself. She was unable to provide further details about her prior elbow injuries.

Physical exam revealed deformity to the left elbow with a decreased range of motion. Radial pulse was 2+ and sensation was intact distally. There was no swelling, radial head tenderness, erythema, or warmth present. Radiograph of the elbow demonstrated a dislocation of the radial head and a subluxed elbow joint without obvious fracture (Figure 1).

Received 08/02/2019

Review began 08/06/2019

Review ended 09/02/2019

Published 09/05/2019

© **Copyright** 2019

Webb et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 3.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

How to cite this article

Webb A L, Slome M C, Walker A, et al. (September 05, 2019) Radial Head Dislocation with Elbow Subluxation in an Adult. Cureus 11(9): e5570. DOI 10.7759/cureus.5570



FIGURE 1: Pre-reduction lateral X-ray of the elbow showing a distal radial head dislocation with elbow subluxation

Etomidate was used for sedation in small aliquots, to a total of 10 mg, for procedural sedation. The joint was reduced by hyperpronation followed by supination with flexion while applying pressure on the radial head. She tolerated the procedure well and without complication. Pain and range of motion improved post-reduction. Post-reduction films showed a suspected hemarthrosis in addition to the resolution of the dislocation and subluxation (Figure 2). She was placed in a sling with swathe and was discharged with intact neurovascular function with orthopedic follow-up.



FIGURE 2: Post-reduction lateral X-ray of the elbow showing reduction of the radial head and elbow joint. Suspected hemarthrosis is indicated by the arrow.

Discussion

Although radial head subluxation is common in children under the age of six, isolated radial head dislocation without an associated fracture or elbow dislocation is rare, and even more so in older children and adults [7-9]. Posterior radial head dislocations are less common than anterior ones [9]. As children age, the annular ligament becomes thicker and has stronger bony attachments [1]. Although the annular ligament is described as being the primary stabilizer of the proximal radioulnar joint and is associated with radial head subluxation, other structures also play a crucial role. The quadratus ligament aids the annular ligament in preventing posterior displacement of the radial head [9]. The typical presentation for a radial head dislocation is the inability to supinate and pronate while still being able to flex and extend [10]. Anterior and anterolateral radial head dislocations have been described after falling and twisting a hyperextended elbow and from a motorbike accident [11-12].

Radial head subluxations are easily reduced with as high as a 98% success rate using hyperpronation [1]. Supination and flexion are also used but with a slightly lower success rate

[1,10]. The majority of cases reported using pronation to reduce the radial head followed by immobilization in the flexed and pronated position, although others note success reducing using supination and immobilizing in the flexed and supinated position [8,11-15]. It has been suggested that posterior radial head displacement may be prevented during pronation by the bony contact when the ulna and the radius cross [9].

Functional outcome is generally good if reduced in the acute setting. However, missed diagnosis or delay in treatment requires surgical intervention and can lead to poor functional outcome, degenerative arthritis, elbow joint instability, and/or reduced elbow flexion [8,12,16-17]. These injuries can be easily missed, especially in cases with polytrauma, as elbow flexion and extension have little to no impairment [8,18-19]. The elbow should be assessed during pronation and supination for pain and reduced range of motion. The radiocapitellar joint alignment on radiographs can be assessed by drawing a line through the middle of the shaft longitudinally. The line should intersect the capitellum [16].

Conclusions

Radial head dislocations in adults without an associated fracture or elbow dislocation are rare but are generally amenable to closed reduction in the emergency department. They can be easily missed on exam, as there is generally minimal to no effect on elbow flexion and extension. We recommend testing pronation and supination on exam to avoid missing this injury. Delay in care can lead to the need for surgical intervention.

Additional Information

Disclosures

Human subjects: Consent was obtained by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

1. Carson S, Woolridge DP, Colletti J, Kilgore K: Pediatric upper extremity injuries. *Pediatr Clin N Am.* 2006, 53:41-67. [10.1016/j.pcl.2005.10.003](https://doi.org/10.1016/j.pcl.2005.10.003)
2. Schutzman SA, Teach S: Upper-extremity impairment in young children. *Ann Emerg Med.* 1995, 26:474-479. [10.1016/S0196-0644\(95\)70117-6](https://doi.org/10.1016/S0196-0644(95)70117-6)
3. Schunk JF: Radial head subluxation: epidemiology and treatment of 87 episodes. *Ann Emerg Med.* 1990, 19:1019-1023. [10.1016/S0196-0644\(05\)82567-3](https://doi.org/10.1016/S0196-0644(05)82567-3)
4. Griffin ME: Subluxation of the head of the radius in young children. *Pediatrics.* 1955, 15:103-106.
5. Pirruccio K, Weltsch D, Baldwin KD: Reconsidering the “classic” clinical history associated with subluxations of the radial head. *West J Emerg Med.* 2019, 20:262-268. [10.5811/westjem.2019.1.41541](https://doi.org/10.5811/westjem.2019.1.41541)
6. Wong K, Troncoso AB, Calello DP, Salo D, Fiessler F: Radial head subluxation: factors associated with its recurrence and radiographic evaluations in a tertiary pediatric emergency department. *J Emerg Med.* 2016, 51:621-627. [10.1016/j.jemermed.2016.07.081](https://doi.org/10.1016/j.jemermed.2016.07.081)
7. Little KJ, Cornwall R: Pediatric elbow dislocations. *Morrey’s the Elbow and its Disorders.* Morrey BF, Sanchez-Sotelo J, Morrey ME (ed): Elsevier, Philadelphia; 2018. 5:327-340.
8. Sharma R, Kapila R, Ahmed M: Traumatic posterior dislocation of the radial head in an adult: a rare case report. *J Orthop Case Rep.* 2015, 5:73-75.

9. Hayami N, Omokawa S, Iida A, et al.: Biomechanical study of isolated radial head dislocation . BMC Musculoskelet Disord. 2017, 18:470. Accessed: July 15, 2019: [10.1186/s12891-017-1829-1](https://doi.org/10.1186/s12891-017-1829-1)
10. Bexkens R, Washburn FJ, Eygendaal D, van den Bekerom MP, Oh LS: Effectiveness of reduction maneuvers in the treatment of nursemaid's elbow: a systematic review and meta-analysis. Am J Emerg Med. 2017, 35:159-163. [10.1016/j.ajem.2016.10.059](https://doi.org/10.1016/j.ajem.2016.10.059)
11. Bonatus T, Chapman MW, Felix N: Traumatic anterior dislocation of the radial head in an adult. J Orthop Trauma. 1995, 9:441-444.
12. Rethnam U, Yesupalan RS, Bastawrous SS: Isolated radial head dislocation, a rare and easily missed injury in the presence of major distracting injuries: a case report. J Med Case Rep. 2007, 1:38. Accessed: July 16, 2019: [10.1186/1752-1947-1-38](https://doi.org/10.1186/1752-1947-1-38)
13. El Ibrahimy A, Shimi M, Daoudi A, Elmrini A: Isolated, traumatic posterior dislocation of the radial head in an adult: a new case treated conservatively. J Emerg Trauma Shock. 2010, 3:422-424. [10.4103/0974-2700.70767](https://doi.org/10.4103/0974-2700.70767)
14. Negi AK, Pestonji MD, Iyer S: Isolated posterior dislocation of the radial head in an adult . J Postgrad Med. 1992, 38:143.
15. Pereles DJ, Labropoulos PA: Posterior radial head dislocation without ulnar fracture . J Orthop Trauma. 1990, 4:358-462.
16. Agarwal S, Scott BW: Missed posttraumatic radial head dislocation . Curr Orthop. 2005, 19:373-378. [10.1016/j.cuor.2005.05.001](https://doi.org/10.1016/j.cuor.2005.05.001)
17. Hasler CC, Von Laer L, Hell AK: Open reduction, ulnar osteotomy and external fixation for chronic anterior dislocation of the head and radius. J Bone Joint Surg. 2005, 87:88-94. [10.1302/0301-620X.87B1.14669](https://doi.org/10.1302/0301-620X.87B1.14669)
18. Gupta V, Kundu ZS, Sangwan SS, Lamba D: Isolated post-traumatic radial head dislocation, a rare and easily missed injury - a case report. Malays Orthop J. 2013, 7:74-78. [10.5704/MOJ.1303.003](https://doi.org/10.5704/MOJ.1303.003)
19. Heidt RS, Stern PJ: Isolated posterior dislocation of the radial head. A case report . Clin Orthop Relat Res. 1982, 168:136-138.