

## CASE REPORT

## Trauma

# Anterior dislocation of elbow in an adult female: A rare case report

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## Funding information

HCA Healthcare

## Abstract

Elbow dislocations are among one of the most frequently dislocated joints, with an incidence of five to six cases annually per 100,000 persons in the United States. The vast majority of elbow dislocations occur posteriorly, secondary to a disruption in the anterior elbow- and posterior elbow-stabilizing structures. Anterior elbow dislocations are rare injuries in both children and adults, occurring as the proximal ulna is forced anterior to the distal humerus with or without the proximal radius. As of 2019, only 21 anterior elbow dislocations without fractures have been reported between 1922 and 2018. Here, we report the rare case of a patient that sustained a complex anterior elbow dislocation after being involved in a motor vehicle collision.

## KEYWORDS

anterior elbow, dislocation

## 1 | INTRODUCTION

Elbow dislocations are the second most common joint dislocations.<sup>1-3</sup> The direction of the olecranon relative to the humerus differentiates elbow dislocations, with 90% of dislocations being either posterior or posterolateral.<sup>4</sup> In addition, dislocations can also be complete or perched, which can be observed radiographically as the coronoid resting on the trochlea instead of complete dissociation.<sup>4</sup> Dislocations are further classified as simple, involving only capsular or ligamentous injury; or complex, involving fractures of the surrounding bony structure.<sup>4</sup> The mechanism for an anterior elbow dislocation conventionally involves a fall on a flexed elbow, with an anterior-directed force on the proximal ulna.<sup>4</sup> However, since an enormous amount of force is required upon a particular orientation of the elbow, simple anterior elbow dislocations have been rarely reported in the literature. Initial management of choice for elbow dislocations includes performing a

closed reduction of the elbow, followed by assessing a series of range of motion exercises, splinting, and repeated neurovascular assessment.<sup>4</sup>

### 1.1 | Case report

A 24-year-old previously healthy female was brought into the emergency department (ED) by the Emergency Medical Services (EMS) as a trauma activation following a motor vehicle collision (MVC) with extensive damage to her vehicle. The patient was reported to have head trauma with loss of consciousness as well as injuries to the extremities. On physical examination in the ED, the patient had a Glasgow Coma Scale score of 15 and no signs of hemodynamic instability. Additionally, the patient was found to have an obvious deformity of the left upper extremity with a laceration over the radial head. There were also deformities of the bilateral lower extremities. Radiograph of the left elbow demonstrated a comminuted fracture of the proximal ulnar metadiaphysis and an anterior dislocation of the proximal radius

Supervising Editor: Jeffrey L. Jarvis, MD, MS.

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**FIGURE 1** Acute elbow dislocation with anterior displacement of the radius-ulna and comminuted fracture of the olecranon.

and ulna with respect to the distal humerus (Figure 1). The patient was placed under procedural sedation for reduction of multiple orthopedic injuries. Reduction of the left elbow anterior fracture/dislocation was performed by a single provider. The physician's left hand held the patient's wrist in supination, while his right hand was placed on the posterior aspect of the patient's distal humerus. While flexing the patient's elbow to 90°, we loaded the patient's forearm axially using our left hand and anterior pressure on the patient's distal humerus using our right hand. This resulted in a satisfying “clunk” with a return to grossly anatomic alignment of the joint (see Figure 2). A long-arm posterior fiberglass splint was subsequently placed. The patient remained neurovascularly intact. Repeated radiographs demonstrated improved alignment of the fracture/dislocation (Figure 3). Computerized tomography with angiography of the left upper extremity was performed and showed no vascular injury. The patient was later admitted to the hospital where she underwent operative repair of the elbow fracture (Figure 4).

## 2 | DISCUSSION

Elbow dislocation is one of the most common large-joint dislocations in both adults and children.<sup>5</sup> The most common etiology is related to sports and often occurs after a fall on an outstretched arm.<sup>5</sup> Posterior dislocations in which the olecranon is displaced posterior to the humerus are the most common scenario observed clinically. Although

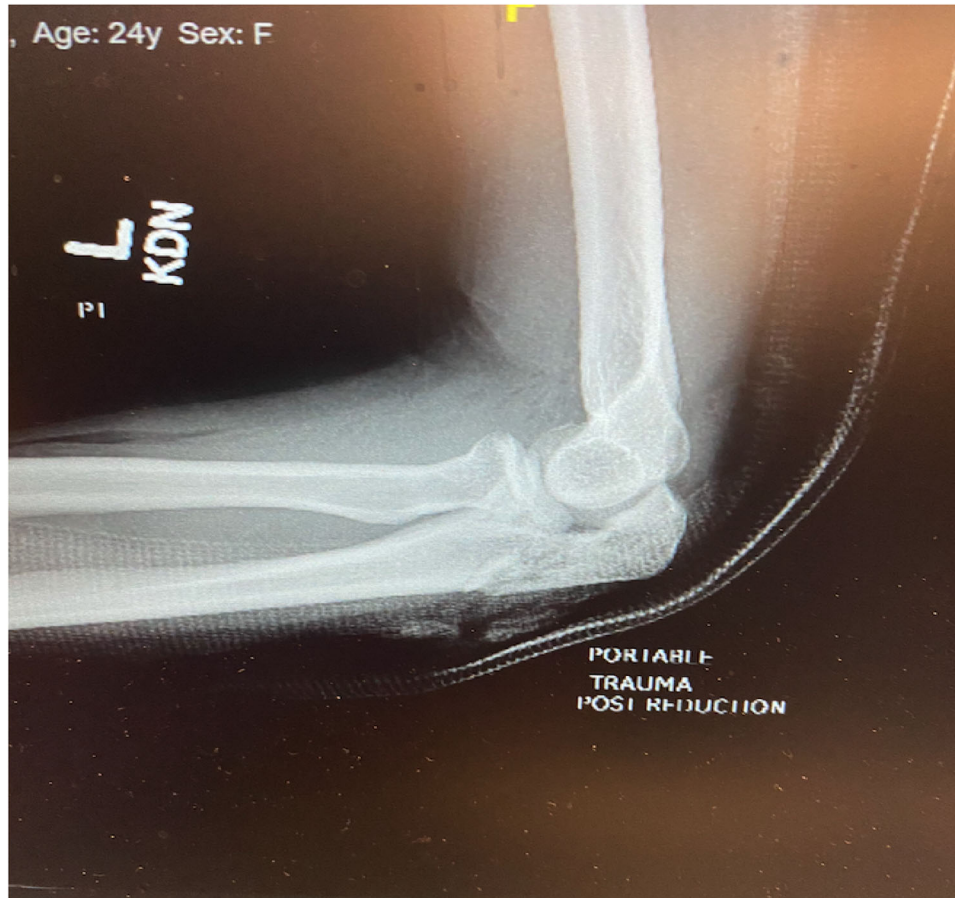


**FIGURE 2** Demonstration of the technique used for reduction of anterior elbow dislocation.

rare with an incidence of less than 2%, anterior dislocation is possible.<sup>6</sup> Previous reports of anterior dislocations mostly occurred after a fall upon a flexed elbow with a concurrent fracture of the olecranon.<sup>6,7</sup> However, our patient presented differently, incurring dislocation following a MVC. Only one previous case of an anterior elbow dislocation after a MVC has been reported in recent literature.<sup>8</sup>

Assessment of patients with a suspected elbow dislocation should begin with a thorough history and physical examination in which the mechanism, intensity, and patient orientation of injury is ascertained. In patients with an anterior dislocation, the forearm appears elongated and held in full extension. In contrast, the forearm often appears shortened and the elbow flexed at 45° in patients with a posterior elbow dislocation.<sup>9</sup> Nerve injury is common in elbow dislocations, notably the median and ulnar nerve, occurring in up to 22% of cases.<sup>10</sup> The majority of patients with neuropraxias will improve after reduction.<sup>10</sup> For diagnostic purposes and treatment planning, all patients with a suspected elbow dislocation should receive anteroposterior and lateral radiographs to identify the direction of the dislocation and the presence of any concurrent fractures.<sup>10</sup>

Reduction of elbow dislocations is dependent upon the extent of injury and orientation of dislocation. Anterior dislocation reduction has been reported with a traction-countertraction technique that differs from the technique we have described.<sup>11</sup> In this traction-countertraction technique, initial in-line traction on the patient's



**FIGURE 3** Post-reduction film of the left elbow with near-anatomic alignment of the olecranon process.



**FIGURE 4** Left elbow with open reduction internal fixation of the olecranon.

forearm is established in order to disengage the olecranon from the anterior humerus.<sup>11</sup> Then, posteriorly directed pressure is applied on the patient's proximal forearm to guide the olecranon past the distal humerus.<sup>11</sup> If needed, anterior pressure to the distal humerus or additional in-line pressure on the forearm can be applied to further facilitate the reduction.<sup>11</sup>

### 3 | CONCLUSION

Posterior elbow dislocation is a common orthopedic injury. However, anterior elbow dislocations, especially those resulting from motor vehicle collisions, are extremely rare. This case highlights the importance of recognizing and managing rare dislocation patterns, demonstrating that appropriate assessment and reduction techniques are crucial in emergency settings. By expanding the knowledge base on anterior elbow dislocations, this report contributes to improving emergency medicine practices and patient care outcomes.

### ACKNOWLEDGMENTS

This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare-affiliated entity. The views expressed in this publication represent those of the author(s) and do not necessarily

represent the official views of HCA Healthcare or any of its affiliated entities.

### CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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**How to cite this article:** Nunez A, Winicki N, Chung P, Vong V, Do N. Anterior dislocation of elbow in an adult female: A rare case report. *JACEP Open*. 2024;5:e13269. <https://doi.org/10.1002/emp2.13269>