Ulnar Fracture With Late Radial Head Dislocation: Delayed Monteggia Fracture

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abstract

Monteggia fractures are rare but commonly discussed lesions, with increasing complications due to late diagnosis. This article describes a case of a Monteggia fracture with delayed dislocation of the radial head. Previous radiographs of a 2-year 8-month-old boy show complete fracture of the distal ulna, with no radial head dislocation. The radial head remained well positioned after 4 weeks. Seven years later, he sustained another arm injury. He was diagnosed with a hematoma but was later believed to have nursemaid’s elbow. He presented to our institution 5 weeks after the injury, and the radial head was found to be chronically dislocated, indicating a displacement occurring sometime during the past 7 years. After failing conservative treatment, the patient underwent surgical repair. The annular ligament was reconstructed using a harvested triceps fascia band, and an ulnar osteotomy was performed.

A review of the literature found few reports of delayed Monteggia fractures, which accounted the delayed dislocations to ulnar angulation. However, our patient showed minimal ulnar angular deformity. We propose that the initial fracture disrupted the annular ligament and the radial head spontaneously relocated prior to being seen, which put the radial head at risk for later dislocation. We present an alternative hypothesis of dislocation after fracture healing and report the longest known period of delay between fracture and dislocation.
A Monteggia fracture is an injury in which the radial head is dislocated in conjunction with a fracture or angulation of the ulna.1 This lesion is rare, accounting for 0.7% of elbow fractures and dislocations.2 Although forearm fractures are more easily recognized, radial head dislocations are frequently missed,1,11 which may be attributable to difficulty in interpreting radiographs. Up to 50% misdiagnosis or late diagnosis rate was found in 1 study.3 Furthermore, reconstruction for late diagnosis has countless complications, including nerve palsy, compartment syndrome, loss of range of motion (ROM), nonunion, malunion, and osteoarthrosis.1,9 Thus, unrecognized Monteggia fractures are a repeated cause of malpractice suits.9 In some cases, the treating physician failed to obtain a radiograph of the elbow. Therefore, in cases of late diagnosis, it is assumed that the radial head was dislocated but not detected. This article presents an alternative hypothesis: in some instances, the radial head may dislocate after the ulna has healed.

**CASE REPORT**

A 2-year 8-month-old boy fell while jumping on his parents’ bed and reported arm pain. Unaware of the severity of the fall, the parents waited until the next morning for medical attention, when the boy was still not using his arm normally.

Both upper extremities had normal neurovascular status and full shoulder, elbow, and wrist ROM. However, supination and pronation were painful, and point tenderness was apparent in the distal one-third of the arm. Mild discomfort existed with palpation at the radial head.

Radiographs revealed a complete fracture in the distal one-third of the ulna, with a well positioned radial head (Figure 1). A sugar-tong splint was placed. At follow-up the following week, repeat radiographs of the proximal and distal radial ulnar joints showed a well-reduced radial head. The patient was able to flex and extend his elbow freely and minimally flex and extend his wrist. He was placed in a long-arm cast at 90° of flexion.

Four weeks later, the cast was removed. The fracture appeared to be well healed. Radiographs showed good callus formation and reasonable position of the distal ulna (Figure 2). The radial head was well positioned in relationship to the capitellum. No further follow-up was performed.

At age 9, the patient rolled off a mattress and was taken to the emergency room. Radiographs initially revealed a hematoma. A second opinion postulated nursemaid’s elbow. He was placed in a cast, and radiographs showed radial head displacement after 2 weeks. An attempted closed reduction was performed under anesthesia, and he was placed in a long-arm cast.

The patient presented 5 weeks after injury. He reported no pain or discomfort, and neurovascular status was normal. Anteroposterior and lateral radiographs confirmed radial head dislocation anterior to the capitellum (Figure 3). Remodeling the anterior aspect of the distal humerus where the dislocated and dysplastic radial head had been articulating indicated a possible chronic dislocation of unknown duration. The patient’s parents opted not to further treat the dislocation.

After 2 months, the pain became significant, and the patient had limited mobility; therefore, surgery was performed. The radial head could not be reduced intraoperatively due to interposed scar and capsule. After this was removed, the radial head could be reduced but was unstable. Therefore, an annular ligament reconstruction was performed with a harvested triceps fascia band, followed by an ulnar osteotomy, and was fixed with a 6-hole plate. The patient was placed in a long-arm cast at 60° flexion and full supination. Anteroposterior and lateral radiographs showed the radial head to be reasonably aligned with the capitellum.

Five months postoperatively, radiographs showed radial head alignment to be retained and a healed osteotomy site (Figure 4). The patient reported no pain, had full flexion-extension ROM and full supination, and could pronate 10°. He is continuing physical therapy to improve forearm pronation.

**DISCUSSION**

Monteggia fractures were first described in 1814 by Giovanni Monteggia.5 These were later categorized by Bado12 into 4 groups depending on the direction of dislocation and force of impact.
Physicians have long struggled with this trauma. Watson-Jones reported “No fracture presents so many problems; no injury is beset with greater difficulty; no treatment is characterized by more general failure.”

Monteggia fractures must be documented early for the best outcomes. Late diagnosis results in an unpredictable and more complex treatment. A delay in diagnosis greatly increases the risk of complications, causing more pain, instability, and deformity, making accurate and timely diagnosis of Monteggia fractures essential.

Perhaps because of the increase in complications seen with delayed diagnosis, missed fractures and dislocations are the most common source of malpractice claims in emergency medicine. Acute Monteggia fractures are often misdiagnosed because of insufficient radiographs that exclude the elbow joint or misinterpretation of radiographs, especially when multiple ossification centers are present. Swelling of the soft tissue surrounding the joint can also mask the dislocation.

Thus, when a patient presents with a chronic radial head dislocation and a history of an ulnar fracture, it is assumed that the patient had an unrecognized acute Monteggia fracture dislocation. The current case offers another possible explanation: the radial head was not yet dislocated and became dislocated after the fracture had healed. Other reports indicated that ulnar angulation may cause a delayed dislocation. However, this was not likely in our case because radiographs revealed minimal angular deformity of the distal ulna.

Few reports have been published in which the radial head was not initially dislocated. Weisman et al reported 2 cases with a delayed radial head dislocation; however, those dislocations occurred after 10 days and 3 weeks. Another case of delayed dislocation in a child was described by Heinrich and Butler, although the dislocation was attributed to persistent deformation of the ulna. The longest previously reported delay between initial injury and recognition of dislocation was 18 months. In this case, an ulnar fracture was present, with no initial radial head dislocation and throughout 7 weeks of casting. The next radiographs were taken at 18 months when the patient reported decreased ROM, and they revealed a dislocated radial head.

To our knowledge, the current case presents the longest delay between an initial forearm fracture and displacement of the radial head. Based on previously reported cases, we believe that the annular ligament was disrupted at the initial injury and the radial head spontaneously relocated before the initial examination and remained aligned throughout the treatment. As a result, the radial head would be at risk for late displacement, which occurred after the patient’s ulna fracture in our case, sometime within the following 7 years. However, because no discomfort or tenderness was reported by the patient, we are unable to identify when the dislocation occurred. It is possible that the radial head was susceptible for dislocation from the minimal trauma that occurred when this 9-year-old boy rolled off the mattress. It is also possible that the radial head was dislocated prior to this incident, as indicated by the remodeling of the distal humerus and the extensive scar formation noted at reduction.

**Conclusion**

Late detection of dislocations of the radial head after forearm fractures are uniformly ascribed to be a breach in the standard of care and are overlooked Monteggia fractures. This article provides an alterna-
tive justification for late diagnosis of a radial head dislocation, in which the radial head remained well aligned throughout treatment for an ulnar fracture and was susceptible for later spontaneous dislocation.

REFERENCES