Unusual Monteggia Type IV Variant with an Ipsilateral Shaft of Humerus Fracture in an Adult - A Case Report

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Monteggia fracture dislocation is a common injury in pediatric age group but it is rare in adults. Giovanni Battista Monteggia was the first person to describe such fractures and later it was classified by Bado into four groups and termed as Monteggia equivalents. Here we present a complex fracture pattern in a 35-year-old gentleman with its treatment modality and outcome. The incidence of Monteggia fracture dislocation in the adult population is not common.[1] It was described by Giovanni Battista Monteggia in 1814 in children.[2] The true Monteggia pathology and its equivalents was classified by Bado using radiographic pattern and the mechanism of injury in 1967.[1,2] We present a 35- year- old male patient who sustained a type IV Montaggia variant fracture along with an ipsilateral shaft of humerus fracture. We believe this has not been previously described and reported in literature.

Keywords: humerus shaft fracture, monteggia variants.

A 35-year-old gentleman presented to our emergency department after sustaining a trauma to his right upper limb following a road traffic accident. He had a rotational injury to the forearm and arm with the elbow in flexion. On admission local examination of the right upper limb demonstrated moderate soft tissue swelling, bruising, and deformity of the right arm and forearm. There were no wounds or neurovascular injuries detected. Radiographic examination revealed a fracture at the midshaft of humerus (AO 1.2.A.2) and a both bone fracture of the proximal third shaft of ulna (AO 2U.2B.2)

Fig 1(a) Plain radiograph showing fracture shaft of humerus with radial head dislocation

and distal third shaft of radius (AO 2R.2.B.2) with an anterolateral dislocation of radial head as in **Figure 1(a) and 1(b).** It was thus classified as a type IV Monteggia variant with an ipsilateral midshaft humerus fracture.

The patient was posted for the surgery on the 3rd day of injury after the decrease in swelling. Open reduction and internal fixation under general anesthesia for both the humerus and forearm fracture was planned. The patient was placed in a supine position with the upper limb abducted 45-60 degrees over an arm board. Using an anterolateral approach, the radial nerve was identified and retracted prior to elevating the brachialis muscle. The humerus was fixed using a 7-holed4.5mm locking compression plate (Synthes, Oberdorf, Switzerlannd) with 3 cortical screws with purchase in 6 cortices both proximal and distal to the fracture site in compression mode to achieve absolute stability. The ulna shaft fracture was then fixed using a subcutaneous approach and fixed using a 10-holed 3.5mm locking compression plate to achieve relative stability. Next, through a volar Henry approach the radius shaft was fixed using a 11- holed 3.5mm locking

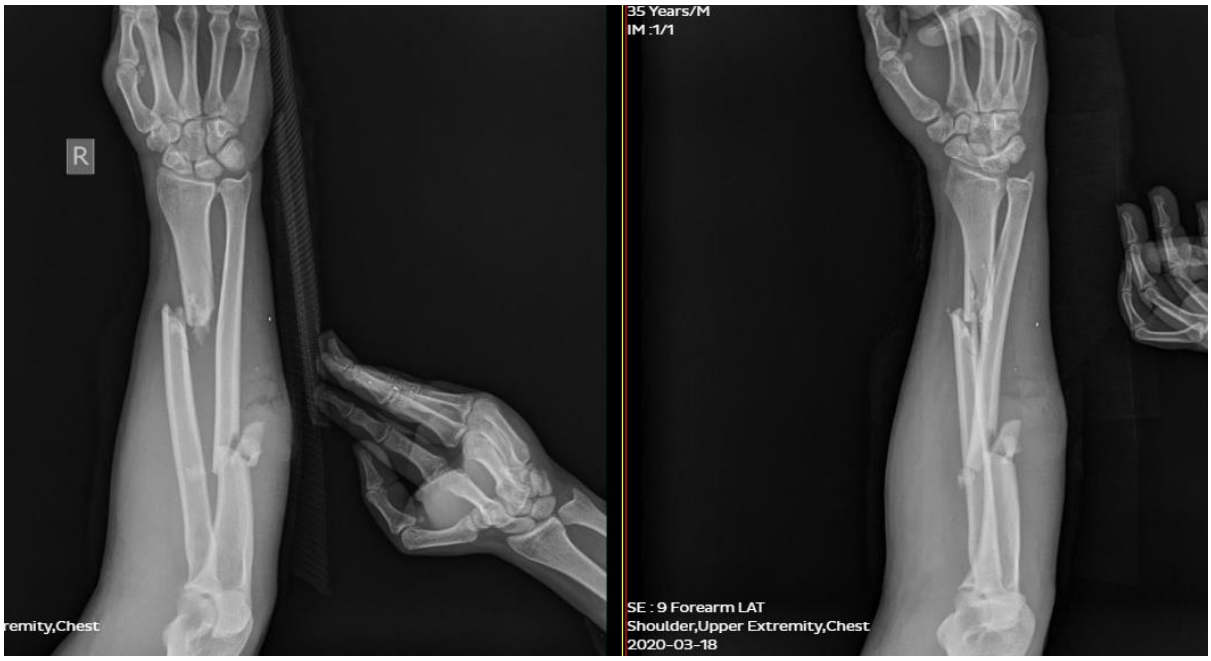

Fig 1(b) Plain radiograph of right forearm demonstrating a fracture of the proximal third shaft of ulna and distal third shaft of radius.

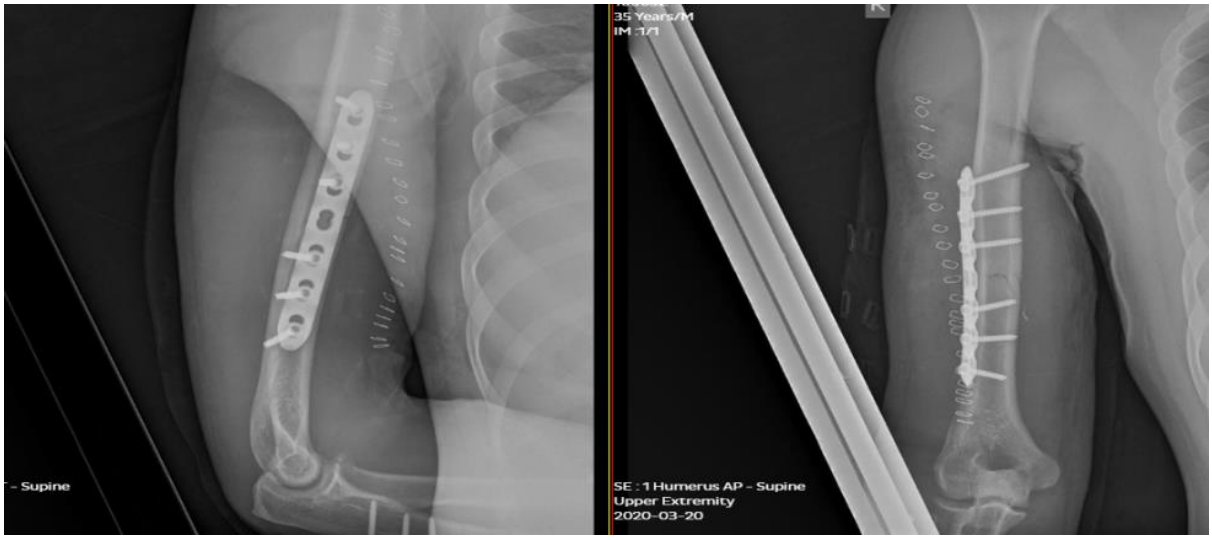

Figure 2(a): Fracture fixation with 4.5mm LCP (Synthes, Oberdorf, Switzerland)

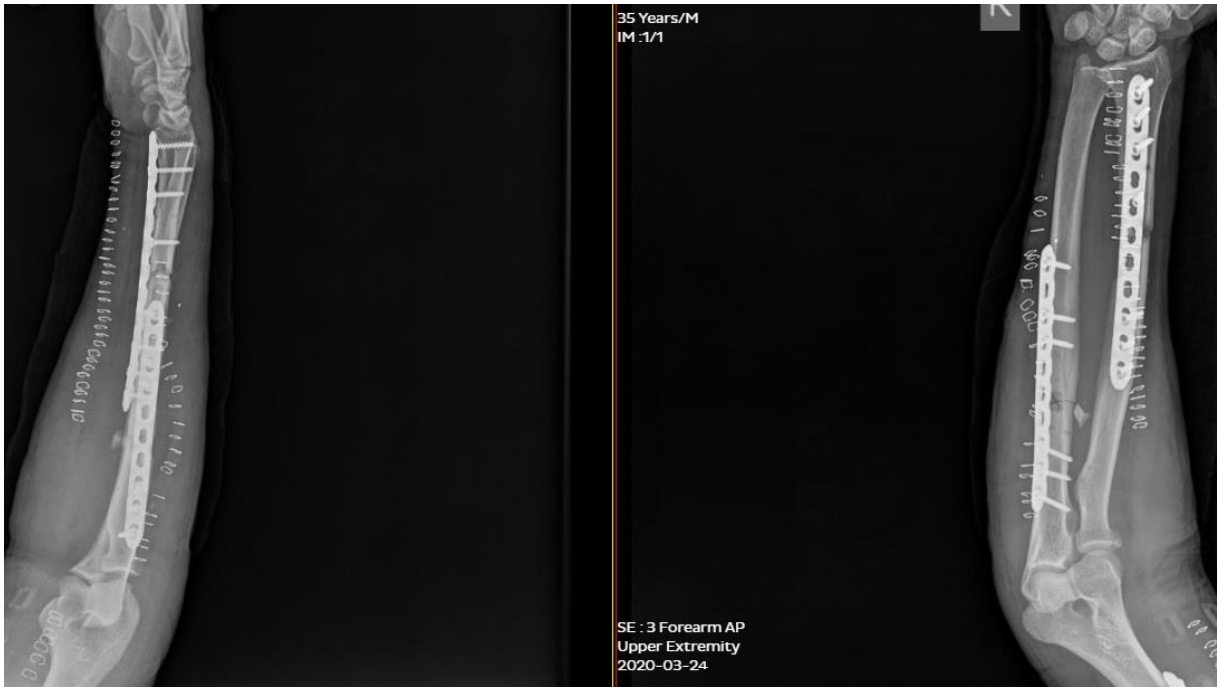

Figure 2(b): fixation with 3.5mm LCP (Synthes, Oberdorf, Switzerland)

compression plate in bridging mode to achieve relative stability (Synthes, Oberdorf, Switzerlannd) **Figure 2(a) and 2(b)** respectively. Following fixation of all the fractures reduction of the radial head was confirmed under C-arm. The elbow was taken through all ROM to check the stability of radial head.

The post-operative period was uneventful. Patient was discharged home on the 5th post-operative day with clean wound and no signs of infection. The elbow was immobilized in a posterior arm splint for 3 weeks after which an elbow rehabilitation was initiated. At 6 weeks follow up the patient was pain free with full elbow

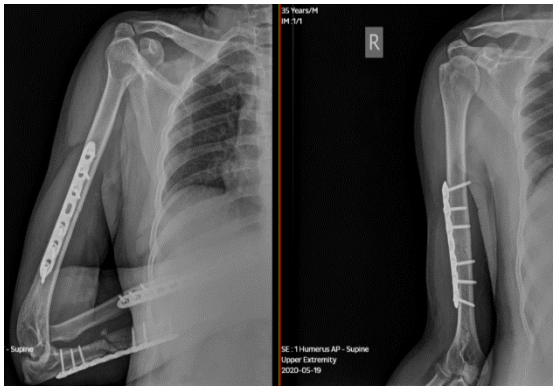

Figure 3(a) two months follow-up radiograph showing healing of the fracture of the shaft of humerus

extension, flexion, and supination to 80 degree and pronation to 70 degree. At 2 months follow up visit a radiograph was done which revealed healing of shaft of humerus and both bone forearm with the radial head in its position **Figure 3(a) and 3(b).** The patient had painless elbow range of motion and a palmar grip of about 60 % when compared to the uninjured side.

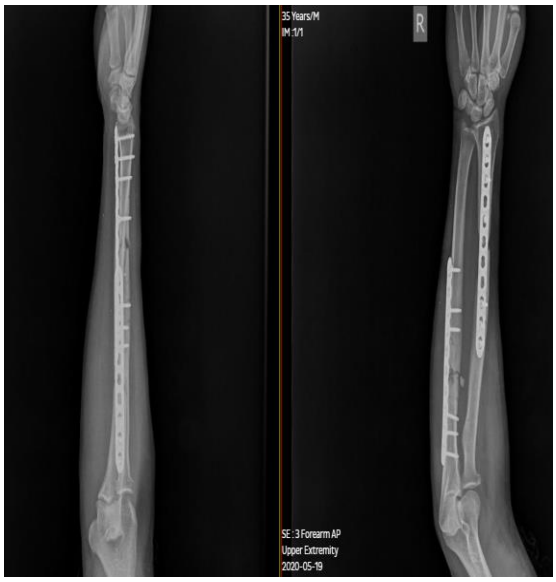

Figure 3(b) Two months follow-up radiograph showing healing of the both bone fracture forearm and anatomical position of the radial head.

Discussion

In this case, the patient sustained a Bado type IV Monteggia variant fracture with ipsilateral fracture shaft of humerus. This is a complex rare adult injury resulting in an unstable floating elbow.[2-4] We do not believe it has been previously described in literature. The history of patient could explain the mechanism of injury. The injury was of high velocity in nature on outstretched hand with the wrist dorsiflexed, forearm pronated and elbow hyperextended with arm abducted levering to break the shaft of humerus. This resulted in the injury to the posterolateral capsule and ligaments around the radial head. [3, 5] There are few cases reported on Monteggia variants and ipsilateral distal humerus fracture but only in the pediatric age group. [2,9,10] .A similar case report was published on 1999 by Arazi et al. where a 13 years old female child sustained a Monteggia lesion and ipsilateral supracondylar humerus with distal radius fracture and was treated with open reduction and internal fixation for the distal humerus and ulnar fracture along with closed reduction of radial head was done. At one year follow-up, the girl had full range of motion on her elbow.[6]

As a principle, the fracture should be fixed early and the radial head position assessed after reduction and fixation of the fractures. If the dislocation of the radial head persists an annular ligament injury should be

suspected which is hindering reduction of the radial head, where an open reduction of the radial head may be warranted. Early rehabilitation is also imperative in order to not lose any elbow range of motion and function. Despite the usual functional outcome being poor in floating elbow[7] our patient recovered with good function and elbow range of motion. Several complications have been described which can prevent good post-operative results such as infection, non-union, myositis ossificans, and neurovascular injury which can result in poor functional outcomes. [8]

Conclusion

Monteggia variants type IV fracture with ipsilateral shaft of humerus fracture is a very rare presentation. It has a high rate of complication. It should be addressed early with full understanding of injury , operative management with stable internal fixation, to allow early mobilization are very essential for good functional outcome.

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