Monteggia variant: an unusual presentation

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Abstract
Introduction
Double injury patterns in the form of Monteggia or Galeazzi fracture dislocation represent a spectrum of forearm injuries which are severe and usually necessitate operative intervention. Association of ulnar dislocation with proximal radioulnar disruption with fracture of the radial shaft, without dislocation of radioulnar joint, represents a rare and unusual double injury pattern which is not classified under the Bado classification system. Although easy to identify, understanding the injury morphology ensures proper treatment. The aim of this study is to present an unusual case of Monteggia variant.

Case Report
A 26-year-old male presented following a road traffic accident with posterior dislocation of ulna and proximal radioulnar disruption with radial shaft fracture at the junction of proximal and middle third; radial head maintained its relation with capitellum. Valgus instability necessitating treatment could be demonstrated despite of posterolateral stability even after close reduction and fixation of radius.

Conclusion
This injury may be classified as an unusual variant of Monteggia fracture dislocation with emphasis on associated management of medial collateral ligament depending on the patient’s profile and fracture personality for optimal results.

Introduction
Double injury patterns in the form of Monteggia or Galeazzi fracture dislocation represent a spectrum of forearm injuries which are severe and usually necessitate an operative intervention. Because the forearm bones and the proximal and distal joints form a closed parallelogram, injury to one is usually accompanied by injury to the opposite limb of the parallelogram. The most common injury patterns are accompanied by either disruption of the distal radioulnar joint or radiocapitellar articulation. We report a case of ulnar dislocation with proximal radioulnar disruption and fracture of the radial shaft without dislocation of the radiohumeral joint. This double injury pattern has been infrequently reported. Although the pattern is easy to identify, understanding the injury morphology is necessary to ensure proper treatment.

Case report
A 26-year-old man presented to an emergency department with complaints of pain, swelling and deformity around the right elbow following a road traffic accident. The limb had no distal neurovascular deficit, and there were no other associated systemic injuries. Radiographic evaluation revealed posterior dislocation of the ulna and proximal radioulnar disruption with radial shaft fracture at the junction of proximal and middle third; radial head maintained its relation with capitellum (Figure 1). Closed reduction of dislocated humeroulnar joint was done under sedation. This considerably reduced the patient’s pain. Subsequent open reduction and internal fixation with 9-holed 3.5mm limited contact dynamic compression plate using Thompson’s approach was done after two days. Intraoperatively after fixation of the radius, joint congruency, which was checked under fluoroscopy, was maintained; valgus opening of the elbow demonstrated medial laxity but no posterolateral instability. The limb was immobilized for three weeks in plaster slab, with the elbow at 90 degrees of flexion. Patient underwent active assisted physiotherapy at the end of three weeks. At four months, the fracture of the radius united with the range of motion of 10–130 degrees of flexion at the elbow, 70 degrees of pronation and 80 degrees of supination of the forearm. The range of motion did not improve further at 1 year follow-up; however, the patient remains pain free with a stable elbow (Figure 2).

Discussion
Although this case appears to be straightforward with an obvious plan involving closed reduction of the elbow followed by anatomical fixation of the radius, the injury pattern is much more complex. Monteggia injuries and its equivalents are well described double injury patterns affecting the ulna and radial head.1,2,3 The injury pattern described in the present case—unhumeral dislocation and proximal radioulnar disruption with radial shaft fracture and maintenance of the radiocapitellar anatomy—is an unusual and rare variant of Monteggia fracture dislocation which is not described under the Bado classification system.

Chung et al. in 1998 suggested radial fractures with associated pericubital dislocations to be type V Monteggia injury,4 thus separating these injuries from classical Monteggia injuries or its equivalents. However, type V injury is still evolving.
Case report

which prevented radiocapitellar dissociation usually occurring in an elbow dislocation. The causative forces are the same encountered in posterolateral rotator instability except for the rotational element of impact. Another difference in these two injuries is the progression of disruption which occurs from lateral to medial in posterolateral instability, commenced from medial side in the aforesaid case and progressed laterally. However, before the lateral structures were injured, the radius fractured probably as a result of some external object acting as a fulcrum at the fracture site. Another plausible mechanism of injury may have been axial transmission of forces which caused radius fracture first and ulnar dislocation thereafter, this is something similar to the causative forces in a terrible triad. However, the presence of medial instability after fixation and absence of any coronoid injury favours the former mechanism of the injury.

Even after fixation of the bony elements, residual valgus instability due to injured medial structures as discussed earlier remains a major concern. Medial ligamentous instability needs to be addressed after fixation, whether operative or non-operative, for optimal functional outcome. Literature refutes any superiority of operative over conservative management for this residual instability. We feel that in low demand patients such as this sedentary worker, conservative treatment offers a good outcome. Operative repair of medial structures is recommended in severe injuries such as dislocations with terrible triad or in high demand patients such as throwing athletes.

Conclusion

This unusual injury needs to be identified as a spectrum of evolving type V Monteggia injury, and after reduction, medial collateral injury should be addressed depending on the profile of the patient and fracture personality for optimal postoperative results.
Consent
Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

References