Neglected reverse Essex-Lopresti injury with ulnar nerve compression

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【**Abstract**】A 45 year old woman was diagnosed as having anteromedial radial head dislocation and distal radius fracture five months after her injury on right forearm. The radial head dislocation led to ulnar nerve compression. She had severe restriction of her elbow movements. She was treated with arthrolysis, decompression of the ulnar nerve and radial head resection. The reverse Essex Lopresti injury and radial head dislocation compressing the ulnar nerve has not been reported in English language literature to the best of our knowledge. A mechanism is proposed for the injury. In acute presentations, restoration of both the radioulnar joints should be done and neglected nature of such injury leads to suboptimal outcomes.

Key words: ***Radius fracture; Unar nerve; Elbow joint***

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Simultaneous dislocation of radial head and distal radio-ulnar joint (DRUJ) is an extremely rare injury.[1] The diagnosis of interosseous membrane disruption is frequently delayed in severe forearm injuries and multiple injuries.[1-4] Chronic concurrent instability of both elbow and wrist joints has been reported only once in English language literature.[3] Essex-Lopresti described classical injury in two cases of radial head fracture, with DRUJ disruption.[5]

We reported an unusual case of neglected anteromedial radial head dislocation resulting in ulnar nerve compression with DRUJ dislocation and distal radius fracture almost reverse of Essex-Lopresti injury.

CASE REPORT

A 45 years old woman presented to outpatient department with complaints of restricted movements of right elbow with tingling sensation and wasting of right hand. She presented to us after five months of her injury. She sustained the injury after a fall on both outstretched hands, first right and then left. She was treated by a quack in the form of massage and above elbow wooden splintage for four months.

On examination right elbow flexion was 30-70 degrees with no further extension possible and pronated with only 10 degrees of rotation possible further. The radial head could be palpated on medial side of elbow and DRUJ instability was found with ulnar head prominence.

Ulnar nerve involvement was found in the form of hypoaesthesia on medial one and half fingers and claw hand. Her radiographs of right forearm with elbow and wrist AP view showed radial head dislocation with its location medial to ulna and on lateral view showed volar displacement of radial head. Distal radius had malunited fracture with ulna dislocated dorso-medially (Figures 1A-1C). On left side, malunited fracture distal radius with disrupted DRUJ was present.

The arthrolysis, decompression of ulnar nerve, and restoration of radiocapitellar joint with/without osteotomy were planned. The ulnar nerve and radial head were exposed by medial approach. Ulnar nerve was identified, and radial head was seen indenting on the ulnar nerve (Figure 1D). The radial head adhesions were excised and ulnar nerve was secured. Then by the Kocher approach the elbow was exposed. The intensive fibrosis made the relocation of radial head difficult. By keeping forearm in pronation, the posterior interosseous nerve was protected. By dissection through the interosseous membrane radial head was relocated to capitellar groove. The instability of radiocapitellar articulation and loss of cartilage favored excision of the radial head. Elbow range of motion including 10-120 arc of motion and 80 degrees each of pronation and supination was achieved on table.

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The wound was closed by layers and posterior splintage was applied.

Range of motion exercises were started from day one. After a follow-up of 1 year she had a range of motion of 0-100 degrees and rotatory arc of 70 degrees each (Figure 1E). She refused any kind of intervention at DRUJ.

DISCUSSION

The anatomic structure of the DRUJ provides minimal stability, resulting in joint translation on minimal force.[1,2] The proximal radioulnar joint is considered to be a very stable joint, which is resistant to traumatic dislocation. The main attachments between radius and ulnae are the capsules of both distal and proximal radioulnar joints, pronator quadratus muscle, interosseous membrane, annular ligament, ulnocarpal ligaments and triangular fibrocartilage complex.[1,2] A lot of force is required to disrupt both distal and proximal radioulnar joints.

Our case is unique in the English language literature with the existence of both distal and proximal radioulnar joint dislocations. The components of the injury were not agreeable with both Monteggia[5], Galeazzi fractures[6] or Essex-Lopresti fracture-dislocation[7] and chronic interosseous membrane disruption.[3] In fact this type of injury can be considered as a reverse Essex-Lopresti injury with radial head displaced to an extent that it was lying medially and compressing ulnar nerve.

Dislocations of the DRUJ are classified according to the displacement of the ulna as dorsal (more common), volar and longitudinal (proximal translation), the latter being the original Essex-Lopresti injury.[5] The mechanism of injury for the dorsal dislocation is hyperpronation, for the volar dislocation hypersupination and original Essex-Lopresti injury are the proximal translation of the radius.[3,5] Isolated radial head dislocation may be posterior (dorsal) or anterior (volar) and the mechanism is hyperpronation and hypersupination of the forearm respectively.[3] As far as the mechanism of injury of the simultaneous dislocation of both joints or the 'criss-cross' injury of the forearm is concerned, the interosseous membrane may play a role and function as a pivot between the two forearm bones.[1,3]

The injuries in our patient did not corroborate the criss cross types of injuries. As our patient had a fall on her outstreched right hand the distal radius fractured along with disruption of DRUJ first. Then the continuing force disrupted the interosseous membrane along with hypersupination of the forearm with torso rotating in pronation. This further led to proximal interosseous membrane disruption leading to migration of the radial head medial to the ulna. Further effort of the patient to support the body weight on left hand fractured the distal radius and DRUJ (Figure 2).

Nerve injuries have been reported in Monteggia fracture dislocation with posterior interosseous nerve as the most common nerve affected. Ulnar nerve has also been reported as neurapraxia in a few cases but the underlying mechanism has always been stretching.[8] Medial dislocation causing direct impingement on the nerve has never been reported in the literature to date.

The decision of reconstruction of the chronic instability at these two joints may be difficult because of the unpredictable outcome of surgery. Redislocation of the radial head is a frequent complication and ulnar lengthening osteotomy is advocated by most authors to facilitate and maintain the reduction. Instability of the DRUJ may become symptomatic after the radial shortening osteotomy. Excision of the radial head may cause rapid proximal migration of the radius due to the loss of the tethering effect of the interosseous membrane, which could lead to wrist and elbow pain due to ulnocarpal and radiocapitellar impingement. We opted for radial head excision as no cartilage and stabilizer of radial head were available due to long standing nature of injury. Distal ulna excision would have resulted in instability of both proximal and distal joints. The ulnar osteotomy was not done due to long standing contractures and the suboptimal outcomes. Our patient was a labourer thus movements of elbow joint were more important for her. Restoration of both radioulnar joints should be the treatment of choice in acute presentations but the neglected nature of such injury makes optimal results difficult to achieve.

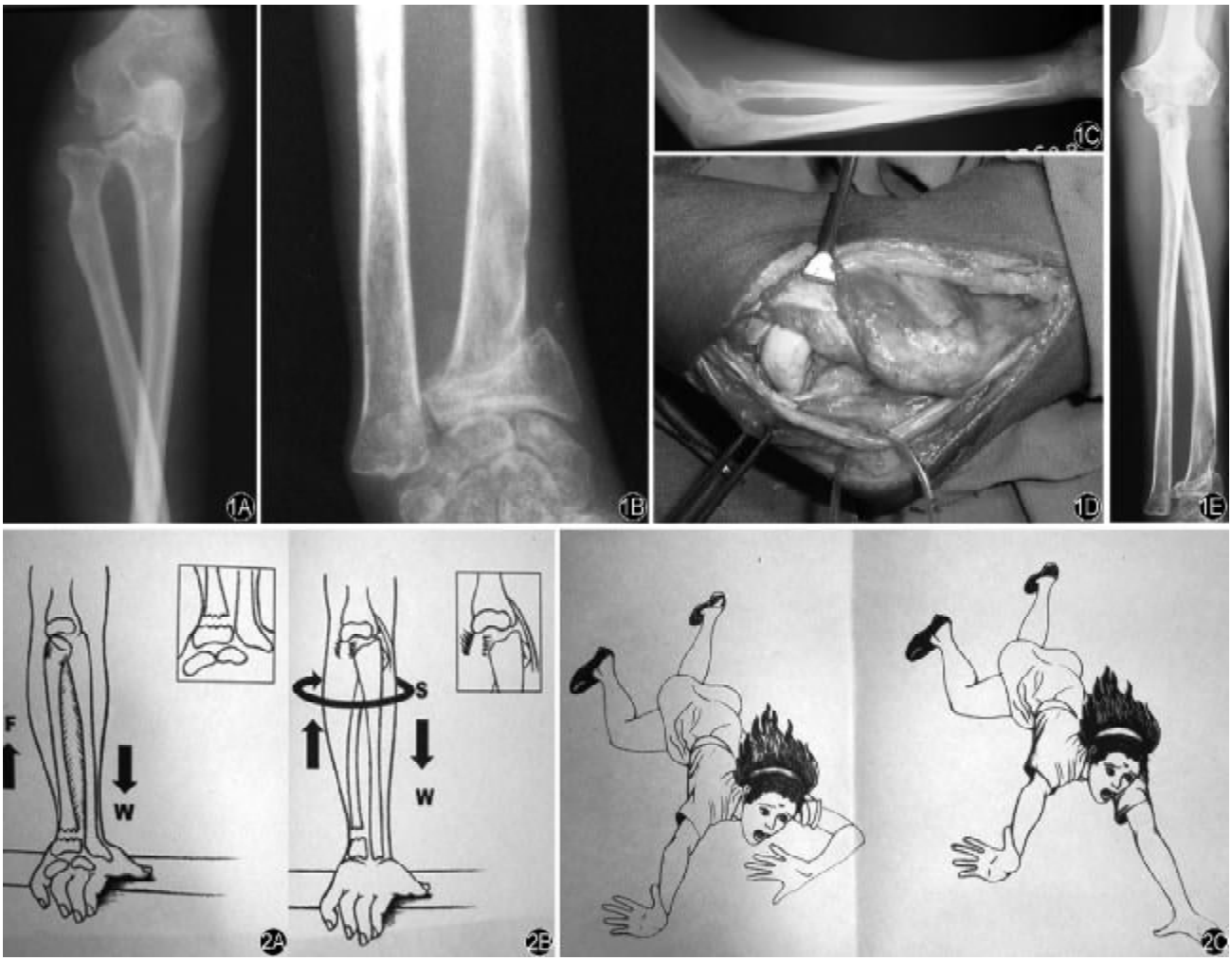

Figure 1. A-C: AP and lateral radiographs of right elbow and hand showing medial dislocation of radial head and malunited distal radius with DRUJ disruption. **D:** Elbow approached medially showing radial head pressing on the ulnar nerve. **E:** Follow-up radiograph showing the excised radial head. **Figure 2. A:** A fall on outstretched hand resulting in a distal radius fracture with volar and palmar radioulnar ligament disruption and radioulnar joint disruption. The force further continued. The inset showing disruption of ligaments and DRUJ. **B:** The body hypersupinated on the fractured forearm fixed on the ground and disrupted the interosseous membrane (arrows). Radial head stabilizers were torn (inset) and due to ruptured interosseous membrane the radial head migrated medially with impingement on ulnar nerve. W=body weight, G=ground, S=supination. **C:** The sequence of injury to both the upper limbs with fall on outstretched hand on right hand first and then left hand.

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