International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319 – 6505, Impact Factor: SJIF: 5.995
Available Online at www.journalijcar.org
Volume 6; Issue 6; June 2017; Page No. 4341-4344
DOI: http://dx.doi.org/10.24327/ijcar.2017.4344.0496

Case Report

SIMULTANEOUS DISLOCATION OF PROXIMAL AND DISTAL RADIOULNAR JOINTS – A CASE REPORT

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A R T I C L E I N F O

Article History:
Received 10th March, 2017
Received in revised form 8th April, 2017
Accepted 14th May, 2017
Published online 28th June, 2017

Key words:
Radial head, DRUJ, Interosseus membrane, Dislocation

A B S T R A C T

Simultaneous dislocation of the proximal and distal radioulnar joints without associated bony injury is rare. We report a 30-year old female with volar dislocation of the radial head and dorsal dislocation of the distal radio-ulnar joint, and discuss the injury mechanism and its management with closed reduction & POP application.

INTRODUCTION

Isolated dislocation of the radial head, without fracture of ulna in an adult is a rare injury[1, 2, 3]. Similarly, isolated acute simple traumatic dislocation of the distal radioulnar joint is a rare injury as well[4, 5]. Both of these injuries occurring together in the same arm in an adult after trauma is an extremely rare event and we have identified only four cases reported in the English literature so far. This pattern of injury does not fit into Monteggia or Galleazi[6] or Essex Lopresti injury pattern. Delayed diagnosis of wrist involvement following an elbow injury is a problem[7, 8] & can lead to significant loss of forearm function and pain. The humeroulnar joint and the radiocarpal joint are not affected in this injury. We describe an unusual case of simultaneous dislocation of the distal and proximal radioulnar joints without an associated fracture, occurring in an adult following a simple fall that responded to closed manipulation and POP slab application. This article aims to emphasize the importance of considering DRUJ involvement following elbow trauma.

CASE REPORT

In October 2016, a 30 year old female, right hand dominant presented to our hospital after fall from stairs on her right hand. The patient presented with her right forearm held in neutral position, elbow in flexion and wrist in dorsiflexion. There was swelling over medial aspect of elbow with echymotic patches over it. She was unable to move the elbow and the wrist whilst finger movements and sensations were normal. Pronation & supination was not possible. No neurovascular injury was detected.

Radiographs revealed an anterior dislocation of the radial head and volar dislocation of the distal ulna. No other fracture was noted and the Ulnohumeral articulation was intact.

Close reduction was performed after administering intramuscular diclofenac. With the elbow in 90º flexion; traction was given to forearm in supination and direct pressure over the radial head was applied. The radial head was reduced with a clicking sound; the distal radio-ulnar joint got reduced automatically in full supination. Patient had relief of pain and the patient regained some forearm rotatory movements as well immediately. An above-elbow slab was applied with the arm in full supination. Radiographs were taken at weekly intervals to ensure that the reduction was maintained. The slab was removed after 3 weeks, and physiotherapy started. No varus or valgus instability could be detected.

At 3 month follow-up, the patient had regained normal handgrip strength, full wrist movement, full elbow and full supination of the forearm, but pronation was restricted beyond 60º. The last follow up at 6 month showed no signs of instability at elbow and full recovery of wrist and elbow movement and function was achieved.

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Fig 1. Radiograph following fall on hand, showing anterior dislocation of radial head with volar dislocation of distal ulna.

Fig 2 Post reduction radiograph showing reduced radial head and distal radioulnar joint.

Fig 3. Clinical photograph at 1 week follow up in supination and pronation.

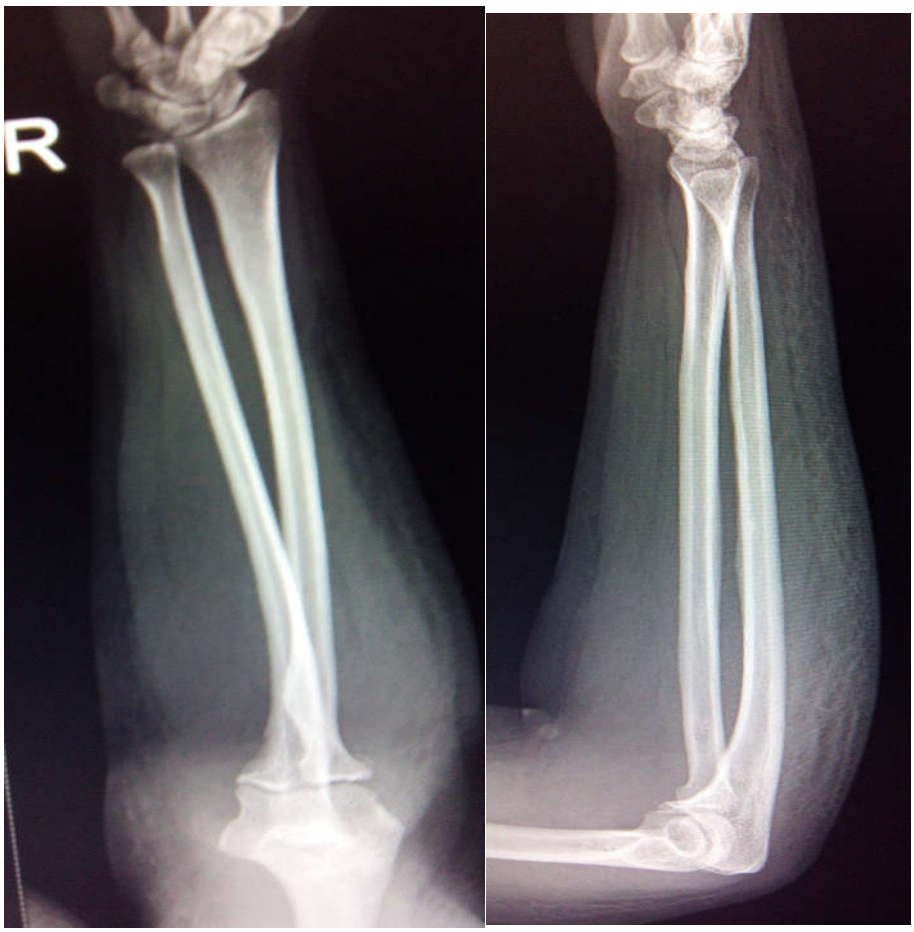

Fig 4. Radiograph at 3 weeks follow up with reduction maintained at superior and inferior radioulnar joints.

DISCUSSION

Simultaneous dislocation of the radial head with dislocation of the distal radioulnar joint without a fracture is an extremely rare injury. According to most reports, the mechanism of injury for volar dislocation of the radial head and dorsal dislocation of the distal radioulnar joint is Hyperpronation[2]. This explains the pattern of injury in our patient. Leung *et al*[9] named this injury as 'criss-cross' injury of the forearm suggesting that the interosseus membrane may play a role and function as a pivot between the two forearm bones to facilitate dislocation of the distal and proximal radioulnar joints. Leung *et al*[9] after cadaver studies, also stated that subluxation or dislocation of one articulation led to incongruence of the other articulation.

Four cases of simultaneous dislocation of the proximal and distal radio-ulnar joints have been reported. As the patient fell onto a dorsiflexed wrist, pronated forearm, and an extended elbow, rotation of the body over the affected arm fixed to the ground may have created further pronation. This would also generate varus strain to the elbow, eventually disrupting the annular ligament, dislocating the radial head anterolaterally. An intact distal radio-ulnar joint could have provided a stable fulcrum. As the patient's body rotated further, hyper pronation would disrupt the dorsal portion of the triangular fibrocartilage and the dorsal radioulnar ligament resulting in volar subluxation of the ulnar head[4]. This combined injury allows the proximal radial head to dislocate and migrate, rather than fracture. This would also be aided by pulling of the pronator quadratus on the distal ulna. This injury therefore differs from an Essex-Lopresti injury, where axial compression acts as the primary force to fracture the radial head and neck, resulting in proximal migration of the radius and subluxation of the distal radio-ulnar joint.

The rotational position of the forearm at presentation is the key to determining the direction of reduction[1]. Our patient presented with pronation deformity, and thus supination was needed for reduction.

Radiographs of the forearm did not demonstrate any fracture. Our report highlights the importance of obtaining radiographs of the forearm showing both the proximal and distal radioulnar joints, even in the absence of a fracture. This report describes a very rare injury treated successfully with closed reduction and POP application. A high index of suspicion is essential to recognize the dislocation of two consecutive joints as optimal outcome for this type of injury requires a prompt diagnosis[8].

The rule of twos' (examination and imaging of the two joints of the forearm, two radiographic views, and two visits to the outpatients department) helps us to prevent missing the diagnosis of wrist and elbow injuries.

We agree with the study of Preziosi *et al*[10] that this injury should be included as a variant in the heterogeneous group of

Essex-Lopresti injuries. It shares the same Pathophysiology, and the radius is disrupted at both the proximal and distal radioulnar joints. The variant in this injury being the absence of a radial head fracture

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How to cite this article:

Shakeel Ahmad *et al* (2017) 'Simultaneous Dislocation Of Proximal And Distal Radioulnar Joints – A Case Report', *International Journal of Current Advanced Research,* 06(06), pp. 4341-4344.
DOI: http://dx.doi.org/10.24327/ijcar.2017.4344.0496

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