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A rare case report of bilateral distal radius fractures including bilateral isolated metacarpophalangeal joint dislocations in a piano artist

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Abstract

Bilateral distal radius fractures are rare injuries and only a small number of case reports exist. Literature reports of low velocity as well as high velocity injuries. It has been found that high velocity injuries are frequently associated with injury to carpals, metacarpals and phalanges. No case has yet been reported in medical literature with respect to bilateral distal radius fractures associated with bilateral single finger Metacarpophalangeal (MCP) joint dislocation. The aim of this case report is to emphasize the rarity of this injury and the associated trauma which are sometimes missed or diagnosed late. This case also highlights the role of skilful urgent reduction and stabilisation of such injuries followed by an early aggressive hand and wrist rehabilitation program to ensure an excellent outcome for the patient.

Case Report: We report a case of bilateral distal radius fracture with MCP joint dislocation of the right index finger and MCP joint dislocation left thumb in a professional pianist following a high energy trauma due to a road traffic accident. The patient underwent surgery in the form of closed reduction and a wrist spanning radial distractor application with pinning of bilateral wrist. Closed reduction was done for the MCP joint dislocation left thumb and open reduction for the MCP joint dislocation right index finger. Patient was on an aggressive physiotherapy regime from the early postoperative period. Both the distal radius fractures united adequately by three months as well as the MCP joint dislocations restored with a satisfactory DASH functional scores.

Conclusion: High energy traumas to the hand and wrist can result in ipsilateral or even bilateral injuries of the distal radius, ulna, carpals, metacarpals and phalanges. Hence, it is important not to miss any associated injury in the small bones of the hand when there is a fracture in the forearm and arm bones. Initiation of an early and intense rehabilitation program requires immediate reduction and fixation of the fractures and dislocations in order to gain the best functional outcome for the patient.

Keywords: Distal radius fracture, Metacarpophalangeal joint dislocation, K wire, Radial distractor, Percutaneous pinning, Rehabilitation

Introduction

One of the most commonly encountered fractures by orthopaedic surgeons world-wide is a fracture of the distal radius. It accounts for 8%-15% of all bony injuries in adults^[1]. Similarly, studies have shown that a distal end radius fracture comprised about 75% of all forearm fractures. It is a commonly encountered fracture in children where it is characterised mostly as a physeal injury or a torus fracture. In the case of adults, this type of fracture is more prevalent in postmenopausal osteoporotic women. The mechanism of injury is typically a low energy in the form of a fall on an outstretched hand or due to high energy impact following road traffic accidents, sports injuries or following a fall from height. Over the years extensive studies have been initiated with respect to these isolated fractures - their management, complications and functional outcomes with encouraging results. However, there are only a few studies in literature that have described bilateral distal radius fractures and a handful of cases reporting the identification and management of associated injuries in the hand following a bilateral distal radius fracture^[2, 3, 4]

The purpose of this article is to report one such injury involving bilateral distal radius fracture with associated bilateral single finger metacarpophalangeal (MCP) joint dislocation. This pattern of injury has till date not been reported in any English medical literature. Our emphasis

will be on reporting of such an injury, followed by the management and the role of rehabilitation in order to bring out the best functional outcome for the patient.

Case Report

A 33 year old lady who is a pianist by profession was brought to the emergency department following a road traffic accident during which she had sustained injuries to her bilateral wrists. Subsequent to a primary survey she was declared hemodynamically stable. On further examination, she presented with tenderness, swelling and deformities of both her wrists. This was associated with deformities of the left thumb and the right index finger both at the metacarpophalangeal (MCP) joints. Radiographs of the injured extremities depicted an extra-articular metaphyseal fracture at the distal end of the left radius with an ipsilateral MCP joint dislocation of thumb (Fig.1). On the right extremity there was an extra-articular metaphyseal distal radius fracture with diaphyseal extension and an ipsilateral dislocation of the MCP joint of the index finger (Fig.2). Under general anaesthesia and fluoroscopy guidance, surgery was performed. A closed reduction of the fractures was performed and the alignment was maintained using a radial distractor for the right side wrist and additionally percutaneous pinning of both the distal radii was performed. A closed reduction of the stable MCP joint dislocation of left thumb was carried out and immobilised using a Plaster of Paris (POP) slab. Closed reduction of the MCP joint dislocation on the right index finger was attempted but failed. Hence, an open reduction was done and fixed using a K-wire (Fig.3 & 4). Early during the postoperative period, the patient was subjected to an intensive physiotherapy regime. K wires and distractor was removed in 3 weeks and converted to below elbow POP cast for 3 weeks with early mobilisation of right index finger and left thumb.

The results of radiographic examination conducted 3 months post injury demonstrated complete union of the distal end radius fractures as well as healing of both the MCP joint dislocations (Fig.5). At 12 months after the injury, the range of wrist motion on the right side was 40° extension to 45° flexion, 15° ulnar deviation and 10° radial deviation, with 70° pronation and 60° supination; that on the left side was 45° extension to 40° flexion, 15° ulnar deviation and 10° radial deviation, with 70° pronation and 70° supination. At 3 months post injury Her DASH score at the end of 12 months is 19. The patient was able to resume playing the piano and imparting lessons without any impediment (Fig.6).

Discussion

Although unilateral distal radius fractures are common, the incidence of bilateral injuries remains obscure. Sporadic case reports exist describing bilateral distal radius fractures. Two of these reports describe the injury in an adolescent athlete and in an adult after a fall from a height; both injuries were treated non-operatively [5, 6] Even though case reports have been described regarding bilateral distal radius fractures, no reports in medical literature have been found where bilateral distal radius fractures were associated with MCP joint dislocations of the fingers - bilaterally.

Following a high velocity injury to bilateral wrist and hand we can expect unilateral or bilateral injury to the wrist and hand bones. An intriguing study by Ehsan and Stevanovic highlights that, skeletally mature patients with bilateral distal radius fractures have more associated injuries [2] It is important to note that a careful examination of high velocity

injuries to the hand is necessary to identify associated injury to phalanges, metacarpals and carpal bones. The goal of management in wrist and hand injuries is to achieve an excellent function with minimal or no deformity. Keeping this in mind, treatment should involve reduction of the fractures and dislocation either by closed or open methods followed by maintenance using plaster or fixation with implants. Once this has been achieved a rigorous rehabilitation program should be initiated. This is essential not only to gain excellent function but at the same time prevent complex regional pain syndrome, which is a disabling condition seen frequently with neglected wrist and hand injuries [7]

This report chronicles one such case of an accomplished pianist who was involved in a road traffic accident and presented with bilateral distal radius fracture with dislocation of single digit MCP joint bilaterally. It highlights upon this rare presentation of trauma with the importance of not missing any associated injury in the small bones of the hand when there is a fracture in the forearm and arm bones. We stress on early and excellent reduction of such fractures and dislocation and the swift initiation of hand physiotherapy to attain the best functional results especially in a high demanding patient.



Fig 1: Left Distal Radius Fracture with MCP Joint Dislocation Thumb



Fig 2: Right Distal Radius Fracture with MCP Joint Dislocation Index finger

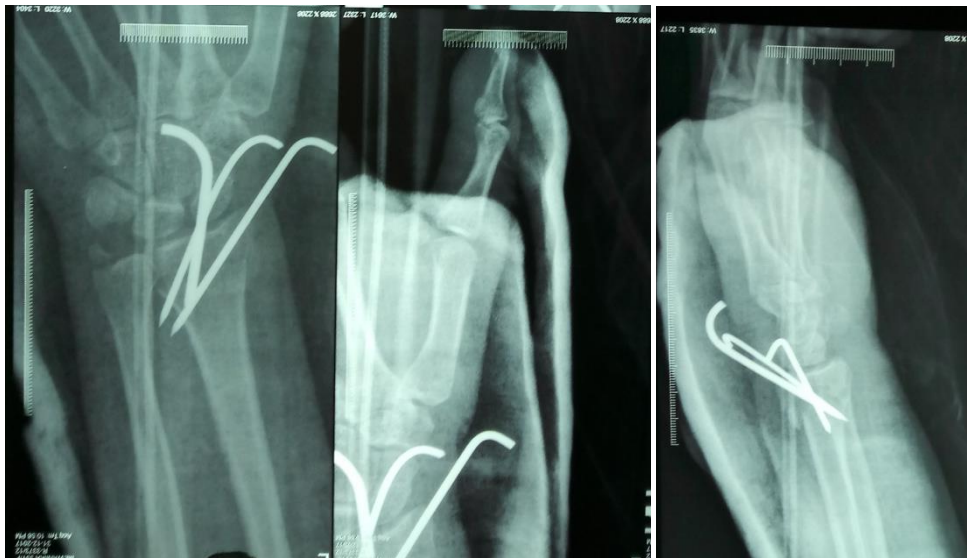


Fig 3: Left Distal Radius Pinning with Closed Reduction Thumb MCP joint (POP slab)



Fig 4: Right Distal Radius Pinning & Radial Distractor with ORIF (K wire) Index finger MCP joint

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Fig 5: Healing of bilateral injuries at 3 Months followup



Fig 6: Patient playing the piano