European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 09, Issue 01, 2022

Fixing an open volar radiocarpal fracture dislocation -a narrow literature to debate

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Abstract:
Introduction: In the overview of literature studies, radiocarpal fracture dislocations are very rare injuries and accounts only 0.2% [1] of dislocations. The mechanism of injury includes motor vehicle accident, fall from height and work place injuries. These injuries were thought to have poor outcomes and high morbidity.
Purpose of study:-
- To enumerate the practical difficulties in fixing a volar radiocarpal fracture dislocations.
- To give a functionally mobile joint and prevent the complications of osteoarthritis and arthrosis.

Case report: A 56 years old male, electrician by occupation sustained a self fall from height (10 feet) while climbing an electric post. He had an open injury to left wrist joint, radius and ulna were dislocated volarly. It was classified as Type 2 radiocarpal fracture dislocation. We fixed it with k-wires and external fixator via dorsal and volar approaches.
Conclusion: Our case study as an adjunct to previous literatures, the outcome came to be good. Radiocarpal fracture dislocation with ulna dislocation needs an earlier intervention with proper preoperative planning. DRUJ instability was common in these patients and required radioulnar pinning.

Keywords: Radiocarpal fracture dislocations, Distal radioulnar joint stability, k wire, dorsal approach.

Introduction:-

In the overview of literature studies, radiocarpal fracture dislocations are very rare injuries and accounts only 0.2%[1] of dislocations. The mechanism of injury includes motor vehicle accident, fall from height and work place injuries. These injuries were thought to have poor outcomes and high morbidity.Barton[2] studied that whenever a rotational injury to carpus occurs, the ligaments of radiocarpal joint are pulled resulting in radiocarpal dislocations. Radioscaphocapitate ligament and short radiolunate ligament are the primary stabilizers of carpus during volar and ulnar translation. Classification of radiocarpal fracture dislocation (RCFD) were described by Moniem et al[3] were Type 1 is without intracarpal lesions and Type 2 is with intracarpal lesions. Various managements of RCFD based on type of injuries include dorsal plate,k-wires, external fixation, tension band wiring, spanning plate fixation.

Purpose of study:-

- To enumerate the practical difficulties in fixing a volar radiocarpal fracture dislocations.
- To give a functionally mobile joint and prevent the complications of osteoarthritis and arthrosis.[(4,5)]

Case report:-

A 56 years old male, electrician by occupation sustained a self fall from height (10 feet) while climbing an electric post. He had open injury to left wrist joint, with radius and ulna dislocated volarly. (Fig 1.1) Our case was classified as Dumontier type 2 lesion where an avulsion type of injury noted. X-rays were taken (Fig 2.1) and posted for emergency fixation. Intraoperatively the flexor Tendons were displaced posteriorly, which were reflected anteriorly. The fracture dislocation reduced and the distal fragment was found to be unstable. K wires were introduced & fixed in column based fashion. A K wire was inserted transversely to fix the DRUJ dislocation and rotational instability. Our case needed dorsal approach to reach the comminuted fragments of distal radius. Incidentally the proximal pole of scaphoid was found to be severely comminuted and hence excised. Ligamentotaxis applied and wound closed in layers, POP applied. X-Rays were taken (fig.2.2). Post-Operatively antibiotics were administered and patient discharged after suture removal. Patient was followed up around 6 weeks , X-Rays were taken and K-wires were removed (fig 2.3&2.4) leaving behind 2 k-wires(DRUJ & radial articular surface).Around 10 weeks remaining K-wires were removed (Fig 2.5). At 12 weeks ligamentotaxis was removed and patient started mobilization.(Fig 2.6)

CASE ILLUSTRATION

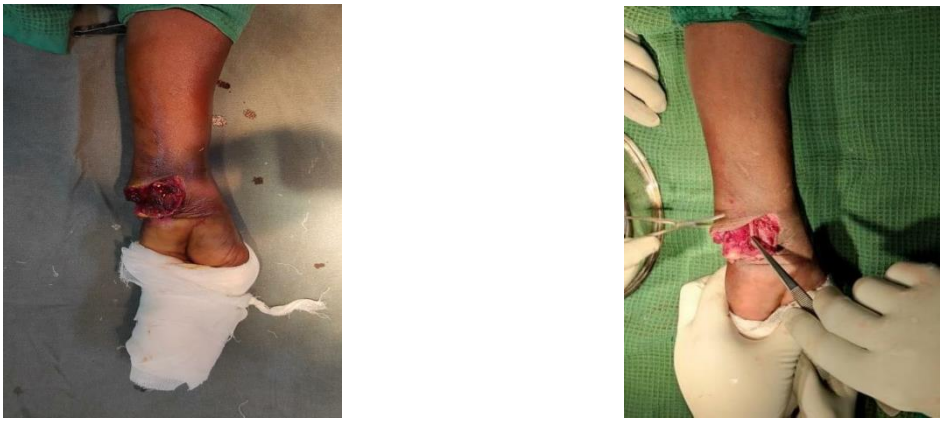

Fig 1.1:-Open wound picture and reflecting flexor tendons volarly

Fig 1. 2:- Assessing the integrity of tendons

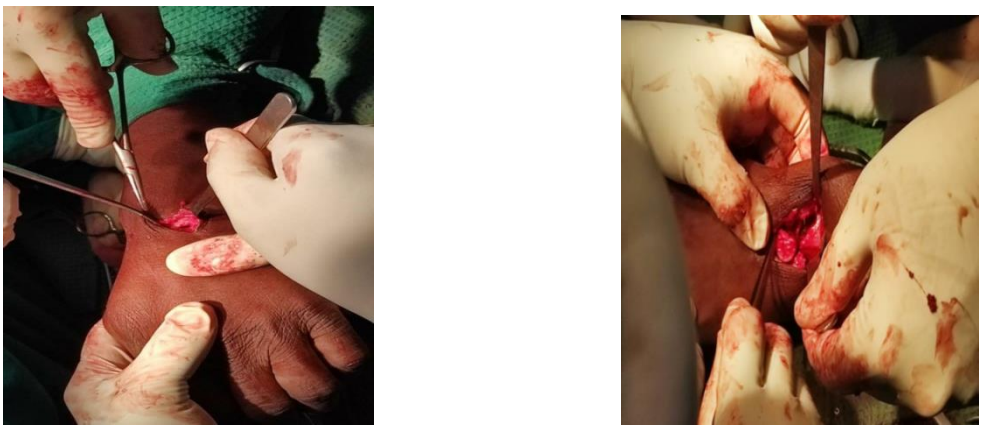

Fig 1. 3: Dorsal approach to remove communited fragments of radius and partial scaphoidectomy

Fig 2.1-Pre op

Fig 2.2 Immediate postop

Fig 2.3 4 weeks

Fig 2.4 8 weeks

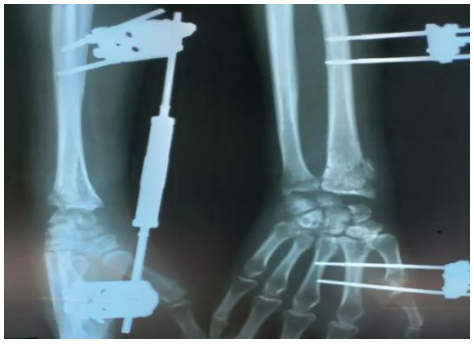

Fig 2.5 10 weeks

Fig 2.6 12 weeks

Fig 2.7 24 Weeks

Range of Movements

Discussion:

In the past literatures, prevalence of radiocarpal fracture dislocations and fixation were less. The knowledge of management has been evolving with new surgical modalities. We followed up the patient for 6 months and has given a satisfied result with respect to clinical and radiological outcome.

Bradon J Em[6] in his cohort study among 17 patients were 10 patients had distal radius fracture dislocation, recommended the importance of intact volar radio carpal ligaments for quick healing. This was in agreement with our case where volar radiocarpal ligaments were intact.

Among classifications of radiocarpal dislocation injuries, Dumontier et al[4] classified into two types. Type 1 involve fracture of tip of radialstyloid process only and Type 2 involve fracture associated with large fragment of radialstyloid passing through the scaphoid.

Spiry et al[7] repaired the radioscaphocapitate and radiolunate ligaments and insisted the need of combined approaches (dorsal and volar) for the same. Certain studies have repaired these ligaments with brachioradialis muscle[8].

In the literature works studied earlier has recommended the use of external fixation in addition to pinning in order to maintain the reduction under ligament tension.

Our case had marginal fracture of radius with ulnar dislocation, where the reduction was difficult and required radiocarpal pinning. Jardin et al[9] emphasized the need of radiocarpal pinning to prevent secondary osteoarthritis.

Girard et al[10] study shows the outcome of repaired intracarpal lesions to be excellent rather than unrepaired .Our patient had good range of motion & function and returned to work after 4 months.

Conclusion:

Our case study in adjunct to previous literature works, the outcome came to be good. Radiocarpal fracture dislocation with ulna dislocation needs an earlier intervention with proper preoperative planning. DRUJ instability was common in these patients and required radioulnar pinning. Intercarpal ligaments and tendons injured has to be repaired for better functional outcome. Proper technique will aid in prevention of osteoarthritis and arthrodesis of wrist joint later. Many literatures have failed to produce proper results since the number of cases were less, and loss of serial follow up. An intergroup comparison of similar injuries will be essential to conclude our study.

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