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## Simultaneous open dislocation of ulnar three metacarpo-phalangeal joints: Case Report and review of literature

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### Abstract

The musculoskeletal injuries of hand require meticulous handling and appropriate intervention for optimal outcome. The open metacarpo-phalangeal (MCP) dislocations are rare injuries with high dependence on early adequate management and early rehabilitation to ensure good function and dexterity. The delicate soft tissue handling and adherence to principles of antisepsis prove instrumental in standard treatment protocol. The MCP dislocations have been studied and reported extensively with other associated injuries or in isolation. The presented report underlines a rare occurrence of simultaneous three MCP dislocations in a hand with an open palmar wound managed accordingly with satisfactory outcome.

**Keywords:** Dislocation, Injury, Treatment, Metacarpophalangeal joint, Hand trauma, Open injury

### 1. Introduction

Forcible axial loading of MCP joint leading to hyperextension is a proposed mechanism of dorsal MCP dislocations, the commoner type [1]. These are rare injury patterns and call for emergent and anatomical reduction and follow up for good functional outcome. Most of these injuries are closed in nature and open dislocations are uncommon. They demand more comprehensive management with regard to associated soft tissue injuries. The early, compliant and supervised physiotherapy and rehabilitation are key element in satisfactory regain of function.

### 2. Case Report

The patient, a 32 year old male, presented to us with history of road traffic accident when he and his vehicle fell into a gorge with all the weight of his body borne by his palm and fingers. He noticed his fingers bent backwards and his palm stretched and ultimately failed to an open wound through which his finger joints were visible outside. There was some bleeding but there was no other injury. He was rushed to a primary centre for first-aid by some people before being referred to us. He brought the radiograph of the injured hand showing ulnar three metacarpo-phalangeal joint dislocation. (Fig. 1) He was given a shot of broad spectrum antibiotic on admission.

On clinical examination of the injury, there was a transverse deep stretch wound with dislocations of ulnar three MCP joints visible through it. The wound was minimally contaminated and was treated with copious lavage following the debridement. The adjoining tendons were intact and the distal neurovascular status intact. The urgent reduction of dislocations was performed after initial radiographs taken. There was no active bleed and wound was dressed and a protective splint was given for symptomatic relief. The dislocations were reduced easily and uneventfully with good stability as judged clinically. We reduced it with traction to the fingers with assistant while direct pressure stabilized the metacarpal heads and this was followed by passive flexion of fingers at MCP joint to a smooth reduction. The adequacy for successful reduction was assessed by post-reduction radiographs. (Fig. 2) the secondary suturing of the wound after five days was done after the wound was clean. The wound and stitches healed well without any complication (Fig. 3). The stitches and splint were removed after ten days to initiate active range of motion. There was no immediate or remote problems related to wound or instability was witnessed on follow up of eight months. The patient was lost to follow up after ninth month.

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**Fig 1:** Radiograph of three MCP dislocations.



**Fig 2:** Radiograph showing good, concentric reduction.



**Fig 3:** Clinical picture of wound – at initial post reduction to healed status at stitch removal.

### 3. Result

There was no finger stiffness or loss of function as noted on subsequent periodic follow up. The wound was completely healed without complications. The patient was pain free and performing activities of daily living.

### 4. Discussion

MCP dislocations form an uncommon injury presentation and are a challenge to treat. Simple dislocations are easily reducible while complex ones require open reduction. The interposition of volar plate leads to a complex dislocation as per reports by Kaplan<sup>[2]</sup>. Open dorsal dislocations are rare patterns with few reported cases<sup>[3]</sup>. Dorsal dislocations often remain stable after the reduction and do not pose problem of instability unlike its volar counterpart which may require ligament repair to check late instability<sup>[4]</sup>. Proper reduction technique with increasing hyperextension followed by flexion in cases of dorsal dislocations is key to uneventful reduction<sup>[5]</sup>. We achieved a satisfactory and uneventful reduction of the deformity with axial traction in the line of deformity followed by flexion of the fingers at MCP joint while having direct pressure over metacarpal heads. The reduction was confirmed clinically with smooth motion and regaining of knuckle shape compared to the normal hand. The reduction was stabilized with a dorsal plaster of paris slab with MCP joint flexed at right angle to prevent hyperextension for three weeks.

Early active range of motion exercise is crucial and should be the objective of the treatment for the optimum outcome even if the dislocation is associated with fracture<sup>[6]</sup>. The judgment of a brief period of immobilization following reduction, however, is based on treating surgeon's decision. The effort should be to enable patient to active range of motion exercises within 72 hours of injury to prevent contractures.<sup>7</sup> Concomitant open or closed dislocations have been reported and require treatment in similar lines<sup>[8]</sup>.

The delay in treatment or inappropriate management is key element of bad outcome like stiffness and suboptimal function due to decrease range of motion<sup>[9]</sup> Longer follow up is required for detection of potential complications like osteonecrosis of metacarpal head or arthritis<sup>[10]</sup>.

### 5. Conclusion

The simultaneous open dislocation is a rare entity but adherence to basic principles of treatment and antisepsis holds key to optimal outcome. The goal of treatment should be rehabilitation oriented and early return of motion a vital objective.

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