

## Case Report

# Post traumatic volar complex dislocation of first metacarpophalangeal joint: a case study

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### ABSTRACT

First metacarpophalangeal (MCP) joint dislocations are very uncommon injuries. These dislocations are classified as volar or dorsal, and then as simple or complicated, based on the direction of the dislocation and its reducibility. Dorsal being the most common approach as it is safer. It is found that reduction was stable and started with immobilisation for 15 days followed by physiotherapy. Postoperatively patient was having range of motion (25-50 deg) and post operative 2 months patient was able to do daily activities with his affected hand with VAS score of 1. Complex metacarpophalangeal joint dislocations needs operative management combined with postoperative physiotherapy to achieve good clinical outcomes so as to reduce the risk of arthritis and decreased grip force.

**Keywords:** Metacarpophalangeal dislocation, Thumb dislocation, Dorsal approach

### INTRODUCTION

Fall on outstretched hand forcible hyperextension of the metacarpophalangeal joints is the common mechanism of injury of metacarpophalangeal joint unlike most of upper limb joints. First metacarpophalangeal (MCP) joint dislocations are very uncommon injuries. Volar dislocations are far less frequent than dorsal dislocations, and are produced by either thumb hyperflexion at MCP joint or a force in flexion to the proximal phalanx.<sup>1</sup> Simple dislocations are MCP joint dislocations that may be reduced using closed procedures, while complex dislocations are irreducible to closed man and need surgical intervention.<sup>2-4</sup> Complex dislocations happen when the volar plate ruptures and gets stuck between the proximal phalanx base and the metacarpal head.<sup>5-7</sup> According to Kaplan, the head of the index metacarpal is caught in a “noose” formed by structures on either side as well as volarly and dorsally. A hyperextension force leads to rupture of the weaker membranous portion of the volar plate from its metacarpal attachment. The metacarpal head

is forced volarly as the hyperextension continues and comes to lie in between the lumbrical muscle radially and the flexor tendons ulnarly.<sup>6</sup> Since the first metacarpophalangeal joint is essential for prehensile tasks, timely treatment of a dislocation and related injuries is necessary for a recovery to normal function.<sup>7-8</sup>

### CASE REPORT

A 42 year old male had self fall on outstretched hand after 24 hr he presented to tertiary care centre with swelling; hyper extension deformity and complete limitation to range of motion with pre operative VAS score 9.

On examination patient was having complete restriction of range of motion, with thumb fixed in hyper extended position. Bony prominence was observed on volar side of hand. patient went through radiographs which revealed volar dislocation of 1st metacarpophalangeal joint. on attempting reduction joint was irreducible hence classified as complex volar metacarpophalangeal dislocation. Patient

was then posted for open reduction of the joint through dorsal approach. Incision taken from the base of thumb so as to expose the joint space. Following ligament seen and further dissected to explore volar plate and reduction attempted by repositioning of volar plate and joint got reduced and stability joint of joint confirmed. Thumb spica given for 3 week and then it was found that joint was stable so aggressive physiotherapy was started. Then patient followed up serially for achieving good outcomes.



**Figure 1: Pre-operative AP X-ray.**



**Figure 2: Pre-operative oblique X-ray.**



**Figure 3: Pre-operative clinical photograph.**



**Figure 4: Pre-operative clinical photograph.**



**Figure 5: Pre-operative clinical photograph.**



**Figure 6: Operative shoot.**

Patient was operated with dorsal approach of 1st metacarpophalangeal joint complex volar dislocation. Patient was having limited range of motion of 1st metacarpophalangeal joint with difficulty in doing daily

activities with the same hand preoperatively due to limitation of movements.



**Figure 7: Immediate post operative X-ray.**



**Figure 8: Immediate post operative radiograph.**



**Figure 9: Post operative 2-month photograph.**

Postoperative 1 month follow-up showed a limited range of motion of 25-50 degree which was allowing the patient to do daily activities without some amount of discomfort and hence serial vigerous physiotherapy done. VAS score at this time was 2 (post op 1 month) with little discomfort followed by VAS score of 1 (post op 2 month) with minimal.

## DISCUSSION

Since a component of the joint maintains congruency, incomplete dislocations are best defined as subluxations. collateral ligaments stay intact, the joint is readily reduced, and postreduction testing shows that it is stable.<sup>10</sup> Closed reduction is usually unsuccessful because of interposition of the dorsal capsule, volar plate, or incarcerated extensor tendons.<sup>1</sup> Neglected dislocation or incomplete reduction of cause chronic instability and painful arthritis, muscle imbalance and decreased grip force.<sup>9</sup> Hence, need fixation.

The volar plate is the most prevalent feature that prevents closed reduction attempts of a complicated MP joint dislocation. It often ruptures from the metacarpal bone's weakest proximal attachments, stays connected to the base of the proximal phalanx, and flips over the metacarpal head, getting stuck between the head of the metacarpal volarly and the base of the proximal phalanx dorsally.<sup>10</sup> Of the different surgical methods, the Dorsal approach is also proven to be safer and simpler in novice hands. Volar approach is more appropriate for repair of volar plate, which will help in long term stabilisation of joint, and visualisation of pathologic anatomy.

## CONCLUSION

Complex metacarpophangeal joint dislocations needs operative management combined with postoperative physiotherapy to achieve good clinical outcomes so as to reduce the risk of arthritis and decreased grip force. Among all the available approaches, Dorsal approach is having short learning curve and safer in inexperienced hands.

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