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Six month old neglected metacarpophalangeal joint volar complex dislocation: a case study

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ABSTRACT

Metacarpophalanegal dislocations are rare, accounting for 3-5% of all dislocations with thumb being the most common finger affected. these dislocations can be decided into volar and dorsal and further into simple and complex, depending upon direction of dislocation and reducibility respectively. Although there is no approach superior over another, we selected volar approach for better visualization and direct reduction of dislocation and found reduction was unstable. hence a temporary fixation was attempted with K-wire which was removed 7th day postoperative and started with physiotherapy. Postoperatively patient was having near total range of motion (25-90 degree) and patient was able to do all the routine daily activities with his affected hand post operative 2 month. Complex metacarpophangeal joint dislocations needs intervention and should be combined with vigorous postoperative physiotherapy to achieve good clinical outcomes.

Keywords: Neglected dislocation, Metacarpophalangeal dislocation, Kaplan's dislocation, Volar approach

INTRODUCTION

Metacarpophalangeal joint dislocations are rare and account for 3-5% of all the dislocations.[1,2] The thumb is the most often involved digit, followed by the little finger.[2] Mechanism of injury is hyper-extension injuries.[3]

The head of metacarpal forms a complex condylar joint which allows multiplanar movements at metacarpophalangeal joint.[4] This metacarpophalangeal joint dislocation is primarily divided into volar and dorsal type depending upon the migration of distal fragment.[5] Further its divided into simple, the one reduced in closed methods, and complex, those which need operative intervention for reduction.[6] Volar plate is considered the most important factor contributing in irreducibility.[3]

These complex dislocations which are not reduced by simple reduction methods, can be reduced with multiple methods. Open reduction of these dislocations can be conducted by either volar or a dorsal approch.[7] Dorsal approach is considered safe in inexperienced hands also as it didn't involve any division of deep transverse ligaments.[4] But inter-positioned volar plate cannot be always fully relived via dorsal approach, and volar approach will be needed to achieve the reduction.[8] In volar approach, repair of the volar plate and complete visualisation of pathological anatomy will lead to improved clinical and functional outcomes.[3]

Here we present a case of 4-year-old patient with 6-month-old dorsal complex 2nd metacarpophalangeal joint dislocation.

CASE REPORT

A 4-year-old male child had self-fall 6 month back for which patient was taken to local bone setter and buddy

strapping was done. patient refused to take any other treatment and presented after 6 months to tertiary care centre with swelling; hyper extension deformity and complete block to range of motion.

On examination patient was having complete restriction of range of motion, with index finger fixed in hyperextended position. Bony prominence was observed on volar side of hand. patient went through radiographs which revealed dorsal dislocation of 2nd metacarpophalangeal joint. on attempting reduction joint was irreducible hence classified as complex dorsal metacarpophalangeal dislocation. patient was then posted for open reduction of the joint through volar approach. Incision taken from the radial end of thenar crease at base of index finger till proximal palmar crease. Following ligament fibrosis seen and transverse fibres of taut natatory ligaments incised and reduction attempted joint got reduced but was dislocating repeatedly. A K-wire of 1.5 mm diameter was used to fix metacarpal head with proximal phalanx. Post-operatively patient was followed up on 7th day and K-wire was removed and physiotherapy was started. Then patient followed up serially for achieving good outcomes.

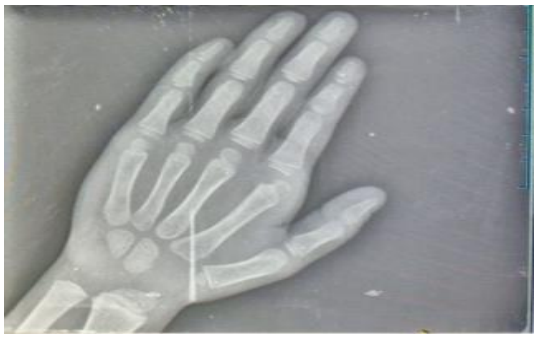

Figure 1: Pre-operative antero-posterior X-ray.

Figure 2: Pre-operative oblique X-ray.

The 6-month-old neglected 2nd metacarpophalangeal joint complex dorsal dislocation was operated with volar approach. Preoperatively patient was having total stiffness of 2nd metacarpophalangeal joint with difficulty in doing daily activities with the same hand.

Postoperative 2-month follow-up showed an appreciated range of motion of 25-90 degree which was allowing the patient to do all the daily activities without any discomfort. Visual analogue score (VAS) score at this time was 1 (post operative 2 month) with very minimal or no symptoms.

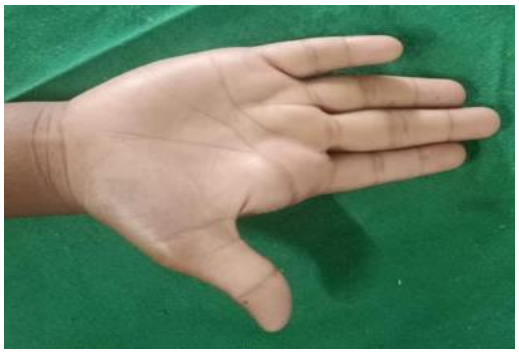

Figure 3: Pre-operative clinical photograph.

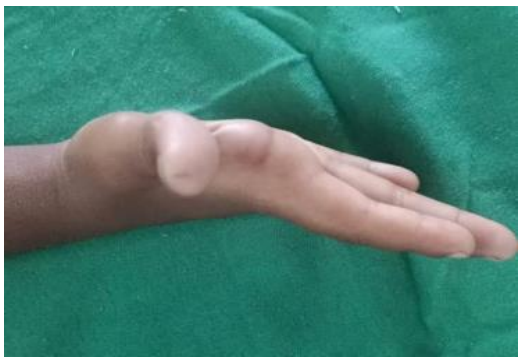

Figure 4: Pre-operative clinical photograph.

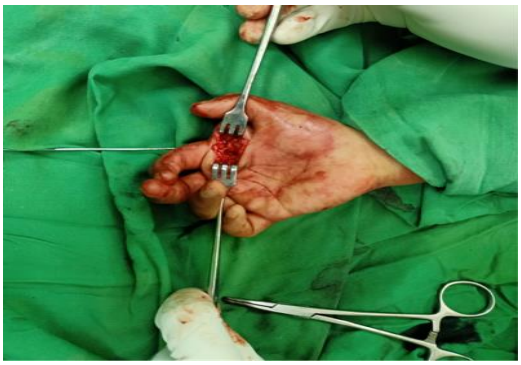

Figure 5: Intraoperative photograph.

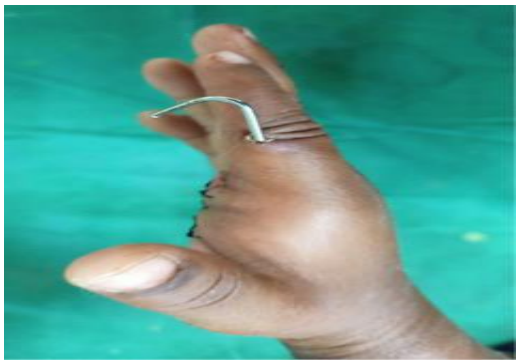

Figure 6: Immediate post operative photograph.

Figure 7: Immediate post operative photograph.

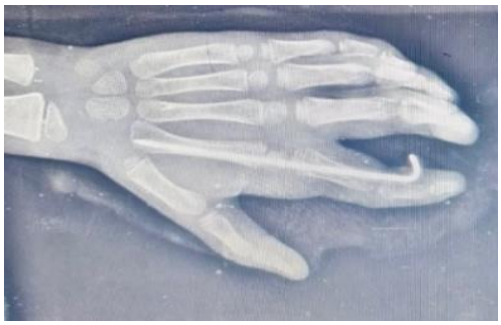

Figure 8: Immediate post operative radiograph.

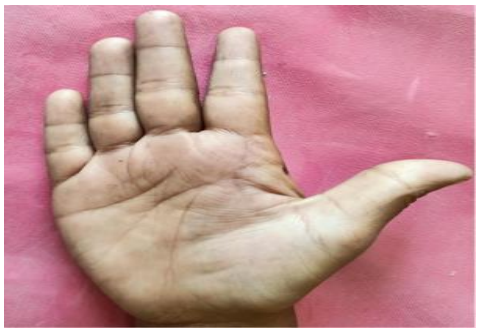

Figure 9: Post operative 2-month photograph.

Figure 10: Post operative 2-month photograph.

DISCUSSION

Metacarpophalangeal joint dislocations are rare and accounts for 3-5% of all dislocations.[1,2] Thumb being the most common, little finger is second.[2] These dislocations are mainly due to hyper-extension injuries.[4] These hyperextension injury cause tearing of membranous attachment of volar plate[4]. volar plate is the most common interposing soft tissue, which ruptures at its weakest location (i.e., membranous insertion at metacarpal periosteum) and lodges into the joint space as the metacarpal head moves down palmary.[5]

There are two widely accepted theories, first one was given in year 1973, Renshaw and Louis postulated that hyperextension of the metacarpophalangeal joint caused the volar plate to interpose between the metacarpal head and the base of the proximal phalanx following tearing of its proximal membranous component, preventing closed reduction.[9] Second in 1981 Wood and Dobyns postulated that hyperflexion of the MCPJ occurred concurrently with proximal migration of the proximal phalanx, resulting in dorsal capsule interposition into the MCPJ, inhibiting closed reduction.[10]

Metacarpophalangeal dislocations can be dorsal or volar, depending upon the displacement of distal fragment.[5] which are further sub-divided into simple, which will get reduced in closed reduction and complex, which will need a surgical intervention.[5]

In available surgical approaches, Dorsal approach is found safer and easier in inexperienced hands also.[4] Volar approach is more appropriate for repair of volar plate, which will help in long term stabilisation of joint, and visualisation of pathologic anatomy.[3]

CONCLUSION

In this case, we found out that a good exposure is possible with volar approach which will be needed in reduction of old dislocations injuries to surrounding structures can lead to repeated dislocations which will need temporary fixation, but a postoperative vigorous physiotherapy can help in achieving good range of motion and a difficulty free daily activity.

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