



Journal Homepage: -www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/8287
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/8287>



RESEARCH ARTICLE

LATE PRESENTATION OF IR-REDUCIBLE COMPLEX DORSAL DISLOCATION OF THE METACARPOPHALANGEAL JOINT OF THE THUMB.

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Manuscript Info

Manuscript History

Received: 20 October 2018

Final Accepted: 22 November 2018

Published: December 2018

Key words:-

Metacarpophalangeal joint,Thumb ,Irreducible dislocation,Open reduction, Volar Surgical approach,Volar plate.

Abstract

Dorsal dislocation of the metacarpophalangeal joint of the thumb is uncommon.complex dislocations occur most commonly in index finger followed in incidence by thumb & small finger &, rarely, long & ring fingers.Complex dislocations are described as dislocations that are irreducible ,involvement of the proximally disrupted volar plate between metacarpal head and base of proximal phalanxand often require surgical intervention because the thumb MP joint, anatomical structures that may become entrapped include the volar plate, sesamoid bones, bony fracture fragments or the flexor pollicis longus tendon. A case report on the post traumatic , complete complex dorsal dislocation the thumb is surgically treated on volar approach is presented .

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Introduction:-

Complete complex dislocation is irreducible by closed means and require open reduction, as the volar plate becomes entrapped between the metacarpal head and proximal phalanx. For the thumb MP joint, anatomical structures that may become trapped include the volar plate, sesamoid bones or the flexor pollicis longus tendon . Metacarpophalangeal (MP) joint injuries and dislocations of the fingers and thumb are not uncommon (1–8). They can be classified directionally as either being volar or dorsal.

Although volar dislocations of the thumb MP joint are exceedingly rare (4). Dorsal dislocations are commonly classified with respect to their ease of reduction into three different categories: incomplete, simple complete and complex (4,6).

The mechanism of injury is either Hyperextension or Hyperflexion injury in volar type of dislocation whereas the dorsal dislocation is more common and is due to Hyperextension injury fall on out stretched hand .

Incomplete dislocations are better described as subluxations because a portion of the joint remains congruous. The collateral ligaments remain intact, the joint is easily reduced and it is stable on postreduction testing. Complete dislocations describe complete disassociation of the joint, and indicate a significant injury or rupture to the volar plate, joint capsule and at least part of the collateral ligaments. In simple complete dislocations, a closed reduction is

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expected to be relatively easy. In comparison, complex complete dislocations are described as dislocations that are not easily reducible and often require surgical intervention.

Case report:-

A 45 Years old / Female Pt. presented to our hospital with complaints of pain and deformity of the right thumb after 10 years of injury to left hand due to fell to backward from 2 wheeler bike , and the left palm landed on the ground with pronation of the forearm. Then, her leftthumb suffered an extreme hyperextension position. At that time of injury , she refused to undergo a closed reduction at her local hospital and finally she presented first time to our clinic after 10 years of postinjury.

On examination, she had a hyperextended deformity at the Metacarpophalangeal joint and flexed PIP joint of left Thumb ,absence of active and passive movements of this joint. There was no neurovascular damage.bayonet positioning of proximal phalanx .skin dimpling in proximal palmar crease

The plain radiographs demonstrated dorsal complete dislocation of MP joint, and that a sesamoid bone was trapped within the joint space (Figure 1A and 1B). Also, this radiographs showed an increased distance between the palmar edge of the base of the proximal phalanx and the metacarpal head.

A new x-ray was taken at this time in the clinic, confirming a persistent complete dorsal dislocation of the thumb MP joint (Figure 1). Detailed inspection of the x-ray revealed possible signs of entrapped structures within the joint. The joint space was significantly widened.



Figure 1:-Left thumb anteroposterior (A) and lateral (B) radiographs at presentation demonstrating a complex complete dorsally dislocated metacarpophalangeal joint. Note the excessively widened metacarpophalangeal joint space and possible sesamoid bone within the joint space on the lateral x-ray.

A single attempt at closed reduction under local anesthesia was attempted but was unsuccessful. Informed consent was obtained and arrangements were then made for an open reduction in the operating room.

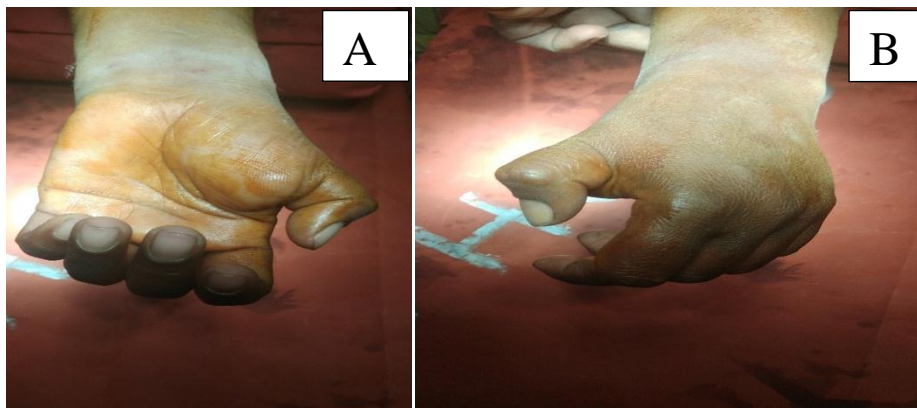


Figure 2:-Above picture shows Left thumb complete dorsal dislocation of metacarpophalangeal joint (A) supination of the hand (B) pronation of the hand.

Open reduction and surgical approach:-

onVolar approach A Longitudinal incision was made over the thumb MP joint. Neurovascular bundle, tendons are separated. The strangulated metacarpal Head and base of proximal phalanx, volar plate are visualized. On the radial aspect of the MP joint, the radial sesamoid bone was found within the joint. This was freed and directed radially out of the joint space. A Free elevator was then passed over the metacarpal head to distract open the MP joint space and gentle, distally directed pressure was applied to the base of the proximal phalanx to reduce the MP joint and volar plate to back in normal anatomical position. Two crossed K-wires were then applied for stability, with the MP joint held in slight flexion (Figure 3). Intraoperative fluoroscopy confirmed an anatomic reduction (Figure 4).

Discussion:-

Complex MP joint dislocations are classically described as complete, irreducible dislocations, and require a surgical approach for reduction and proper alignment. They occur most commonly in the index and little fingers. They are relatively rare in the thumb, and exceedingly uncommon in the long or ring fingers (4,7). The most common structure that inhibits a closed reduction of a complex MP joint dislocation is the volar plate (20). It usually ruptures from its weakest proximal attachments to metacarpal bone, remains attached to the base of the proximal phalanx, and flips over the metacarpal head, becoming trapped between the base of the proximal phalanx dorsally and the head of the metacarpal volarly. Any attempts at reducing the proximal phalanx over the metacarpal head are then impossible because the volar plate remains wedged within the joint space. Other culprits reported to lodge within the joint and preclude reduction include the sesamoid bones, collateral ligaments, bony fragments and the flexor pollicis longus tendon.

Of particular clinical importance in the emergency room or out-patient clinic is the fact that a simple complete MP joint dislocation can be transformed into a complex complete irreducible dislocation if not reduced properly and in a timely manner (7). Closed reduction is best attempted under expertly applied local anesthetic so that the patient is comfortable, relaxed and pain free. For the thumb, we prefer radial and median nerve blocks performed at the wrist. Distally directed pressure is then applied to the base of the proximal phalanx with the metacarpal in a position of flexion and adduction. If necessary, flexing the interphalangeal joint and the wrist will further relax an entrapped flexor pollicis longus tendon that may be blocking reduction. It is imperative not to pull and distract the proximal phalanx when attempting the reduction. This opens up the MP joint space and affords the opportunity for the volar plate to flip over the metacarpal head and become trapped, converting a simple dislocation into one that is complex.

In the volar approach, a Bruner type incision is made on the volar aspect of the MP joint. Care is taken not to damage the displaced and more superficially located neurovascular bundles (5,19). The A1 pulley is released, the flexor pollicis longus tendon is moved radially or ulnarly, the joint is inspected and the offending anatomical structure(s) removed from the joint space under direct visualization.

In the dorsal approach, the extensor apparatus is split longitudinally and the joint approached from a dorsal direction. A trapped interposed volar plate is usually easily identified, split longitudinally and anatomicly reduced. Proponents of the dorsal approach cite several advantages. These include lower risk of injury to the digital neurovascular bundles, full visualization of a dorsally entrapped volar plate and, if present, a better management of associated osteochondral fractures (6,9,11). Unfortunately, the dorsal open reduction is also associated with its own drawbacks. It requires vertical splitting of volar plate to reduce it and the metacarpal head. It has been hypothesized that splitting of the volar plate could reduce long-term stability of the MP joint.

The length of time between injury and reduction is also important. Ideally, any dislocated joint should be reduced within hours. The longer it remains dislocated, the harder it is to obtain a closed reduction. The longer a joint remains unreduced, the more likely the development of degenerative arthritis and the less satisfactory the results of surgery in terms of pain, joint stability and range of motion. After several months, contraction of soft tissues (eg, collateral ligaments) occurs, and more 'surgically inflicted' trauma is usually required to obtain satisfactory reduction, again further limiting postoperative expectation of regain of function.

Postoperatively, there is some debate over the period of immobilization. Some authors recommend an early mobilization protocol (20,21), while others prefer immobilization for three to four weeks postoperatively (20). As a guide, it is important to stress the MP joint postreduction to assess the degree of joint stability. If it feels stable, an earlier mobilization protocol is reasonable. If it is unstable, splinting and/or K-wires are required to stabilize the joint, preferably in approximately 25 degrees of flexion. In this instance, most recommend three to four weeks of

immobilization followed by range-of-motion exercises guided by a trained hand therapist and gradual weaning of the splint.

Given the late presentation of our patient, we were quite satisfied with the ease with which we were able to obtain an anatomical reduction without too much untoward dissection and destruction of normal structures. However, given the postreduction instability of his joint, his K-wires were left in for three weeks, after which range-of-motion exercises were initiated in our hand therapy department.

Conclusion:-

we recommend the volar A1 pulley approach for treatment of avulsion fractures of the base of the proximal phalanx. For other injuries of the MP joint, including the intra-articular proximal phalanx base fractures, and metacarpal head fractures, the dorsal approaches are preferred method avoids injury to the digital nerves, the volar plate is identified and split vertically whereas the volar approach chances of digital nerves are more and volar plate is retrieved and opposed to metacarpal or deep fascia.

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