

Rehabilitation of MP dislocations

Anatomical considerations: The normal MP joint is a diarthrodial, condylar type joint. The joint is stabilized by collateral ligaments which originate on the dorsal aspect of the metacarpal head-neck junction and insert on the volar aspect of the proximal phalanx. The metacarpal head has a greater surface area than the base of the proximal phalanx. The articular surface of the head is convex and has a wider palmar surface. The asymmetry of this surface accounts for the collateral ligaments to be slack in extension and taut in flexion, thus creating stability of the extended digits.

The collaterals are the primary stabilizers against varus, valgus and dorsopalmar stresses. Radial and ulnar deviation is maximized in extension and is decreased with flexion when collateral ligaments become tight.

Another important stabilizer of MP joint is the volar plate, which has a thick origin proximal to the metacarpal neck and becomes thin distally where it attaches upon the proximal phalanx. The distal site is the site of tearing with dorsal subluxation of the proximal phalanx upon the metacarpal. The volar plate is the primary stabilizer against hyperextension.

The sagittal bands of the palmar fascia and tendons of the intrinsic musculature of the hand provide further support.

Pathogenesis of MP dislocations: The mechanism of this injury is typically a fall on an outstretched hand causing hyperextension of the vulnerable digit. Hyperextension injuries either stretch or tear the palmar plate. This locks the metacarpal head in the palm and results in a dorsal dislocation of the proximal phalanx. Hyperflexion has been reported as a cause of injury in a few cases. Wood and Dobyns reproduced the injury in cadaver specimens by applying hyperflexion and a proximal translational force to the proximal phalanx.

Epidemiology of MP dislocations: Dislocations of the MP joints of the fingers are relatively uncommon injuries. The most frequently involved digit is the index, followed by the small finger, due to the unprotected position of these two digits. In a series of 13 patients with dorsal MP dislocations, the fingers were involved in the following proportions: index finger 5, middle finger 2, ring finger 1, and little finger 5. The dislocation was closed in 11 cases and open in 2. Volar dislocation of any MP joint is rare in comparison with dorsal dislocation (dorsal dislocation is twice as common as palmar dislocation).

Diagnosis of MP dislocations:

- Pain
- Limited movement
- Digit deformity
- X-ray (A.P & lateral views)

Simple subluxations of MP:

- Proximal phalanx is hyperextended 60-90 degrees on the head of metacarpal
- The articular surface of the base of the proximal phalanx lying directly on the metacarpal head & neck

Complex dislocations of MP:

- Proximal phalanx is only slightly hyperextended
- Flexion is impossible
- The distal joints are slightly flexed
- The digit itself is mildly deviated toward the adjacent, more central digit
- Dorsally a hollow can be palpated proximal to the base the proximal phalanx
- The prominence felt in the palm corresponds to the metacarpal head

Nonoperative versus operative management in MP dislocations:

Upon a patient's presentation to the Emergency Department, it is important to distinguish between subluxation or reducible (simple) and complete or irreducible (complex) dorsal dislocations. Understanding this anatomic distinction is important in planning treatment, because the former is reducible by closed means, whereas the latter is not. The first description of an irreducible dorsal MP joint dislocation is attributed to Malagaigue in 1855. In 1876, Farabeuf described in detail the difference between reducible and irreducible dorsal MP dislocations of the thumb, and used the phrase "complex dislocation" for irreducible dislocations. In the case of a simple or reducible MP joint dislocation, the volar plate is not separated from the proximal phalanx. These dislocations merely require manual reduction, and need splinting with the finger flexed 60 to 70 degrees. The reduction procedure for simple dislocations should be performed by flexing the wrist and placing gradual pressure distally and volarly over the dorsal base of the proximal phalanx. Longitudinal traction, rather than force applied at the base of the proximal phalanx will entrap the volar plate in the joint and may convert a simple dislocation into a complex dislocation.

Complex MP joint dislocations involve separation of the volar plate from its proximal site or origin and entrapment of the plate within the joint. Radiographic findings include a widened joint space and often the presence of a sesamoid bone within the joint space. A single attempt may be made to reduce the dislocation. Repeated attempts may lead to degenerative arthritis and reduced final range of motion. Consequently, it is essential to recognize patients with complex dislocations and to refer them for surgical treatment immediately.

Irreducible volar dislocations of the MP joints have been reported but are extremely uncommon. Close reduction should be attempted under adequate anesthesia. Failure necessitates an open reduction through a dorsal approach.

Open dislocations are often easy to reduce due to severe disruption of the soft tissues while closed dislocations are more difficult, often requiring surgical reduction. However, closed reduction should be attempted first in all cases.

Complications of MP dislocations:

- Reduced range of motion
- Digital nerve damage
- Degenerative arthritis
- Loss of hand function

Rehabilitation following simple MP dorsal dislocations:

Early range of motion is allowed after reduction, with a dorsal extension block splint preventing extension beyond neutral.

Rehabilitation following complex MP dorsal dislocations:

Immobilization of the joint in 30 degrees of flexion is continued for 2 weeks, after which active range of motion is begun with a removable dorsal extension block splint used to prevent the last 10 degrees of extension. At 4 weeks the splint is used only for protection and at 6 weeks it is discontinued.

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