



## Palmar Dislocation with Extensor Tendon Interposition and Radial Collateral Ligament Rupture of the Thumb Metacarpophalangeal Joint: A Case Report

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### Abstract

We present a case of irreducible palmar dislocation of the thumb metacarpophalangeal joint that has never been described before. Palmar dislocations of the MCP joint are uncommon, as only 25 cases have been described in the literature up to date. Most of those were irreducible due to extensor tendon interposition and required open reduction. All of these injuries were associated with UCL ruptures. In our case a 50-year old male presented with a thumb injury after he fell on his hand during the yearly Carnival festivities. A palmar dislocation of the thumb was diagnosed but reduction failed in the ER. Upon surgical exploration the volar plate was intact and the flexor tendon in its anatomical position. A dorsal approach revealed palmar entrapment of the extensor pollicis longus and brevis around the radial condyl of the metacarpal head and into the joint. There was an additional RCL rupture. After the extensor tendons were relocated and the RCL repaired, the MCP joint was stable.

This is the first report of palmar thumb MCP dislocation due to extensor interposition that is associated with RCL rupture. A primary dorsal approach seems advisable in this type of injury.

**Keywords:** Metacarpophalangeal joint; Palmar dislocation; Radial collateral ligament rupture

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### Introduction

Palmar dislocations of the metacarpophalangeal joint of the thumb (MCP1) are uncommon. Only 26 cases have been reported in English literature so far. According to the most recent review article most cases require open reduction because they are irreducible or remain unstable after closed reduction [1]. The prognosis is poor and only closed and stable reduction leads to favourable functional outcomes.

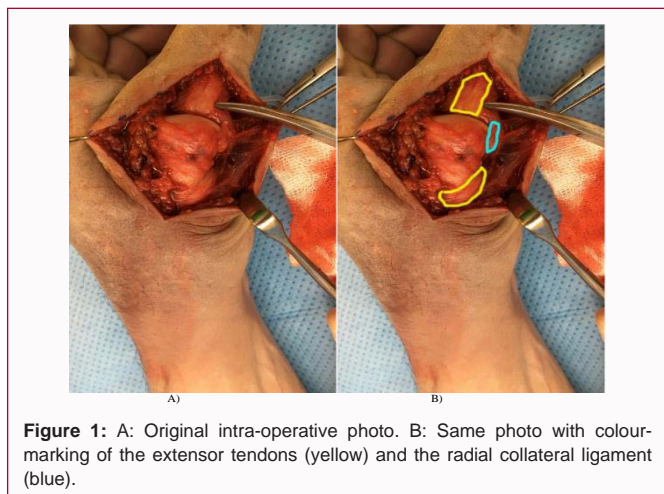
Palmar MCP1 dislocation can be associated with extensor tendon interposition, volar plate disruption, extensive collateral ligament damage and capsule tears. Of those, tendon interposition is the most common and it always requires open reduction. Notably, all 10 tendon interposition cases described in literature were associated with ulnar collateral ligament rupture and none with radial collateral ligament rupture.

Therefore, we report the first case of palmar MCP dislocation of the thumb with extensor tendon interposition and radial collateral ligament rupture.

### Case Presentation

A 66-year-old man presented at our hospital after he tripped and fell while running. He sustained a dislocation of the thumb of his left, non-dominant hand. Because of a concussion and alcohol intoxication he couldn't remember exactly what happened, but eyewitnesses declared that he probably fell on top of his hand. X-ray imaging showed a palmar dislocation of the metacarpophalangeal joint of the left thumb. Closed reduction was unsuccessful. At surgery the next day, a primary palmar approach was chosen but the volar plate was not in the joint and the flexor pollicis longus and sesamoid bones were in their anatomical position.

Because reduction was not obtained, a dorsal approach was chosen. The caput of the first metacarpal was exposed directly under the skin, without any dorsal capsule or extensor tendons running over it. Further exploration revealed that the extensor pollicis brevis and longus were



**Figure 1:** A: Original intra-operative photo. B: Same photo with colour-marking of the extensor tendons (yellow) and the radial collateral ligament (blue).

wrapped around the radial condyl and to the palmar side of the metacarpal head (Figure 1). Using retractors, the tendons were repositioned to their original course, after which the joint could be easily reduced. Checking stability of the joint showed a radial, not ulnar, collateral ligament rupture. Because the ligament was ruptured proximally it was re-inserted with a Mitek anchor at its origo. After that, the joint was stable and congruent on intra-operative X-ray imaging. No extra stabilizing K-wire was deemed necessary.

Postoperatively, the patient was treated with a cast for four weeks after which he started intensive hand therapy. 6 months after the injury the MCP range of motion was very poor but it was stable and painless. IP flexion was 60 degrees with an extension deficit of 30 degrees.

## Discussion

Although dorsal dislocation is caused by hyperextension of the thumb, palmar dislocation appears most likely to occur when there is impact on the flexed thumb [2,3]. Analysis of the aetiology of palmar MCP1 dislocations showed mostly bike and motorcycle accidents [1]. Their 'handle bar grip' renders them most prone to this injury because on impact this grip forces the thumb into the palm of the

hand, causing palmar dislocation. Furthermore, the mechanism of UCL rupture often seen in these cases is comparable to that in a skiers' thumb, where the hand is holding a ski-pole handle when falling.

However, in our case the RCL was ruptured. Probably a different trauma mechanism occurred. Unfortunately, our patient could not recall what exactly happened, besides falling on his hand while running. We hypothesize that the thumb was flexed and held in the hand palm. During the fall on his hand the dorsal impact caused a palmar dislocation of the MCP joint and hyperpronation of the proximal phalanx resulted in RCL rupture. The unusual combination of these injuries let the extensor tendons slip over the radial condyl.

Concerning the operation technique, we recommend a primary dorsal approach for palmar MCP1 dislocations. All relevant structures can be exposed and there is less risk for damaging the neurovascular bundles. Even in the rare case of volar plate interposition, only one case is described in literature, the dorsal approach provides sufficient exposure [4].

Palmar MCP1 dislocations with extensor blocking around the radial condyl and concomitant RCL rupture has never been described before. We present a hypothesis for its trauma mechanism and advise a primary dorsal approach for irreducible or unstable palmar MCP1 dislocations.

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