



Case Report

# Volar Dislocation of the Metacarpophalangeal Joint of the Ring Finger Complicated with Chondrolysis: A Case Report and Review of the Literature



## 病例报告及文献探讨: 无名指掌指关节掌侧脱位引起软骨溶解

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### ABSTRACT

Volar dislocation of the metacarpophalangeal joint is rare injury. In the literature consulted only seven cases of isolated volar dislocation of the metacarpophalangeal joint of the ring finger have been published. Chondrolysis associated with the metacarpophalangeal joint dislocation has not been reported in the English literature. In this paper, an unusual case of volar dislocation of the metacarpophalangeal joint is presented and a review of the literature is described.

### 中文摘要

掌指關節掌側脫位是一種罕見病例，一共只有7例病例在無名指發表在文獻上。在英文文獻上沒有病例是無名指掌指關節掌側脫位引起軟骨溶解。我們在本文中報告了這一個不常見的無名指掌指關節掌側脫位及探討文獻。

### Introduction

Volar dislocation of the metacarpophalangeal joint (MCPJ) is rare. Most of the dislocations are dorsal. Open reduction is necessary if closed reduction has failed. We report a case with volar dislocation of the MCPJ of the ring finger with open reduction.

### Case report

A 49-year-old right-handed lady suffered from an injury to the right hand after she slipped, fell, and landed on the floor on her right hand. On examination, there was a 2-cm superficial laceration over the palmar surface of the proximal interphalangeal joint of the right middle finger, with preservation of the flexor tendon. The MCPJ was swollen. Neurovascular examination was normal. X-ray of the right hand showed closed volar dislocation of the MCPJ of the right ring finger without fracture (Figure 1).

An emergency operation with suturing of the right middle finger wound and an attempt at closed reduction of the right ring finger

MCPJ was performed under X-ray screening (Figure 2). The MCPJ was stable only in the range of 40 to 80 degrees of flexion of the MCPJ with volar pressure applied. Due to the instability, open reduction was performed via a volar approach under general anaesthesia. Both radial and ulnar sides of the collateral ligaments were ruptured. The volar plate was ruptured and was found jammed in the MCPJ. A cartilage defect was found over the dorsal area of the proximal phalangeal base. Part of the interposed volar plate was excised and the collateral ligaments were repaired with a nylon suture. After the repair, the MCPJ was still unstable and dislocated volarly with extension beyond 40 degrees. An axial K-wire was inserted to splint the MCPJ in 70 degrees of flexion (Figure 3). Splintage was given postoperatively for protection.

The K-wire was removed 4 weeks after the operation. The patient was referred to physiotherapy for active and passive mobilization. However, she developed complex regional pain syndrome after the operation. Stiffness of the all fingers was noted with pain. One year after the operation, there was limited range of motion over the MCPJ (5 to 10 degrees). Subsequent X-ray showed chondrolysis of the ring finger MCPJ (Figure 4). She reported to be pain free over the affected MCPJ and could cope with daily activity.

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**Figure 1.** X-ray showing closed volar dislocation of the MCPJ of the right ring finger.



**Figure 2.** X-ray showing persistent volar dislocation even on splintage.



**Figure 3.** X-ray showing reduction of the MCPJ with insertion of the K-wire.

## Discussion

Volar MCPJ dislocation is considered a rare injury. MCPJ dislocation can be classified as simple or complex by means of its reducibility and stability. Dorsal dislocation occurs more commonly than volar because of the unique anatomy of the MCPJ.<sup>1</sup> The volar plate helps to stabilize and support the MCPJ on the palmar surface. The flexor tendons and A1 pulley are at the palmar aspect of the volar plate and these provide further stability. The dorsal side of the MCPJ is considered weaker due to a thin dorsal capsule.<sup>2</sup>

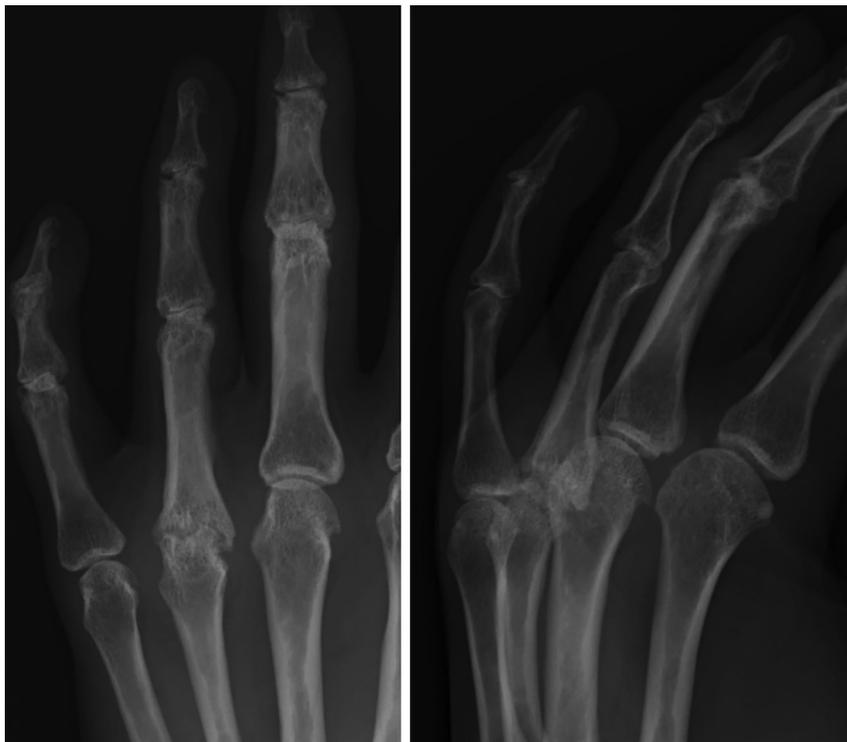
Isolated volar dislocation of the MCPJ of the ring finger is a very rare injury. There were seven cases in total reported in the English literature from 1982 to 2014 (Table 1). The ring finger is generally more stable than other fingers, as it is protected by both middle and little fingers from the side and it is shorter than the middle finger.

In addition to the volar plate becoming interposed in the joint, the dorsal capsule or collateral ligaments can be avulsed and entrapped inside the joint. There was a case report describing the junctura tendinum connecting the fourth and fifth extensor digitorum communis tendon slipped distal and then volar to the metacarpal head, leading to an irreducible joint.<sup>3</sup>

MCPJ dislocation is associated with collateral ligament injuries and, therefore, stability should be examined after successful reduction. Repair of collateral ligaments or the volar plate should be performed if there is significant instability.<sup>3</sup>

Both volar and dorsal approaches have been discussed in the literature. The volar approach carries a risk of neurovascular bundle injury. The dorsal approach was found to be safer and to allow better visualization of the volar plate. In our opinion, the volar approach is preferred since it provides excellent visualization of the anatomical structures, allows to release the A1 pulley, and facilitates the reduction. Careful protection of the displaced neurovascular bundle can avoid mishaps. However, if necessary, a combined approach can be used.<sup>2</sup>

In our case, an extremely rare complication of chondrolysis of the MCPJ is found. To our knowledge and internet searches, it was



**Figure 4.** X-ray showing chondrolysis of the MCPJ of the right ring finger.

**Table 1**

Summary of the eight cases of ring finger MCPJ dislocation

	Age	Sex	Injured side	Treatment	Interposed soft tissue	Final flex/ext arc (degrees)
Betz et al (1982) <sup>5</sup>	70	F	L	Open reduction	Volar plate and ulnar collateral ligament	Full ROM
Boland (1984) <sup>6</sup>	65	F	L	Closed reduction		Decreased by 20 degrees
Khuri and Fay (1986) <sup>7</sup>	31	M	L	Closed reduction		5 weeks, some pain, full ROM
Takami et al (1999) <sup>8</sup>	20	M	R	Closed reduction		Full ROM
	60	F	R	Closed reduction		75
Lam et al (2000) <sup>1</sup>	44	M	L	Open reduction	Volar plate	80
Murase et al (2004) <sup>9</sup>	52	F	L	Open reduction	Volar plate	60
Our case	49	F	R	Open reduction	Volar plate	10

F = female; L = left; M = male; MCPJ = metacarpophalangeal joint; R = right; ROM = range of motion.

not reported in the English literature. Chondrolysis is usually described over shoulder, hip, and knee joints. The causes were postulated as mechanical, chemical, and thermal. Nonarthroplasty operative treatment such as arthrolysis, joint debridement, or manipulation for chondrolysis are of limited value but may be reasonable for young patients. Joint replacement remains the gold standard for the treatment of chondrolysis and joint stiffness.<sup>4</sup>

### Conclusion

Volar dislocation of the MCPJ of the ring finger is rare and usually requires open reduction. Both volar and dorsal approaches can be used depending on the surgeon's preference and the concomitant injuries. Chondrolysis of the MCPJ is an extremely rare complication of finger joint dislocation. Collateral ligament stability should be examined during the operation. Early recognition of complex regional pain syndrome (CRPS) and good rehabilitation are the keys to success.

The prognosis of this injury varies depending on coexisting complications.

### Conflict of interests statement

There is no conflict of interests.

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