

Clinical case

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Volar dislocation of the metacarpophalangeal joint of the thumb: open reduction and repair of the ulnar collateral ligament. A case report

Luxación volar de la articulación metacarpofalángica del pulgar: reducción abierta y reparación del ligamento colateral cubital. Reporte de un caso

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ABSTRACT. Introduction: metacarpophalangeal dislocations of the thumb are not very frequent injuries, it is necessary to know the anatomy of the region to know possible causes of interposition that prevent a closed reduction of this pathology. **Case presentation:** we present the case of a 75-year-old woman with a post-traumatic metacarpophalangeal dislocation of the thumb that required open reduction and surgical repair. In this procedure, we performed reduction of the dislocation, mobilization of the interposed structures, repair of the capsule and reinsertion of the ulnar collateral ligament. The early mobilization protocol helped to obtain very good results. **Conclusion:** it is imperative to consider possible associated injuries during the acute phase to achieve optimal short, medium, and long-term outcomes for our patients. A comprehensive and proactive approach to diagnosis and treatment is vital in effectively addressing this pathology and minimizing its potential sequelae.

Keywords: dislocation, metacarpophalangeal, thumb, ulnar collateral ligament.

RESUMEN. Introducción: las luxaciones metacarpofalángicas del pulgar no son lesiones muy frecuentes, es necesario conocer la anatomía de la región para conocer posibles causas de interposición que impidan una reducción cerrada de esta patología. **Presentación del caso:** presentamos el caso de una mujer de 75 años con luxación metacarpofalángica postraumática del pulgar que requirió reducción abierta y reparación quirúrgica. En este procedimiento realizamos reducción de la luxación, movilización de las estructuras interpuestas, reparación de la cápsula y reinserción del ligamento colateral cubital. El protocolo de movilización temprana ayudó a obtener muy buenos resultados. **Conclusión:** es imperativo considerar posibles lesiones asociadas durante la fase aguda para lograr resultados óptimos a corto, mediano y largo plazo para nuestros pacientes. Un enfoque integral y proactivo del diagnóstico y tratamiento es vital para abordar eficazmente esta patología y minimizar sus posibles secuelas.

Palabras clave: luxación, metacarpofalángica, pulgar, ligamento colateral cubital.

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Introduction

Volar dislocations of the metacarpophalangeal joint of the thumb (MCP) are quite rare. Dorsal dislocation of both the MCP and carpometacarpal joints is more frequent.¹

Dislocations are considered simple when closed reduction is achieved and complex when an open reduction

is necessary due to soft tissue interposition. Different structures have been involved in preventing closed reduction: volar plate, dorsal capsule, collateral ligaments or interposition of the extensor tendons.²

The aim of this article is to present a rare case of volar metacarpophalangeal dislocation of the thumb that was successfully treated through open reduction and repair of associated injuries.

Case report

The informed consent of this patient was obtained for the publication of this case. This study is exempt from ethical approval. This work has been reported in line with the SCARE criteria.³

A 75-year-old woman who attended the Emergency Department with pain in the thumb of her left hand after a fall on a public road. Physical examination showed deformity in the thumb with the sign of «skin dimpling» and dorsal depression (*Figure 1*), swelling and pain on palpation of the metacarpophalangeal joint of that finger with significant limitation of mobility.

Anteroposterior and oblique X-ray of the hand was performed, and volar metacarpophalangeal dislocation of the thumb was observed. Moreover there was a fracture of distal phalanx of the thumb that was treated conservatively (*Figure 2*).

Closed reduction under local anesthesia with mepivacaine was attempted without success. Therefore, an open exploration was performed in the operating room under regional anesthesia using an axillary block and an ischemia cuff on the root of the limb.

A zigzag dorsal incision was made with the ulnar base centered on the metacarpophalangeal joint.

The findings were: herniation of the metacarpal head through the intraarticular dorsal capsule, ulnar dislocation of the extensor pollicis longus (EPL) and extensor pollicis



Figure 1: Physical examination showed signs of «skin dimpling» and dorsal depression.

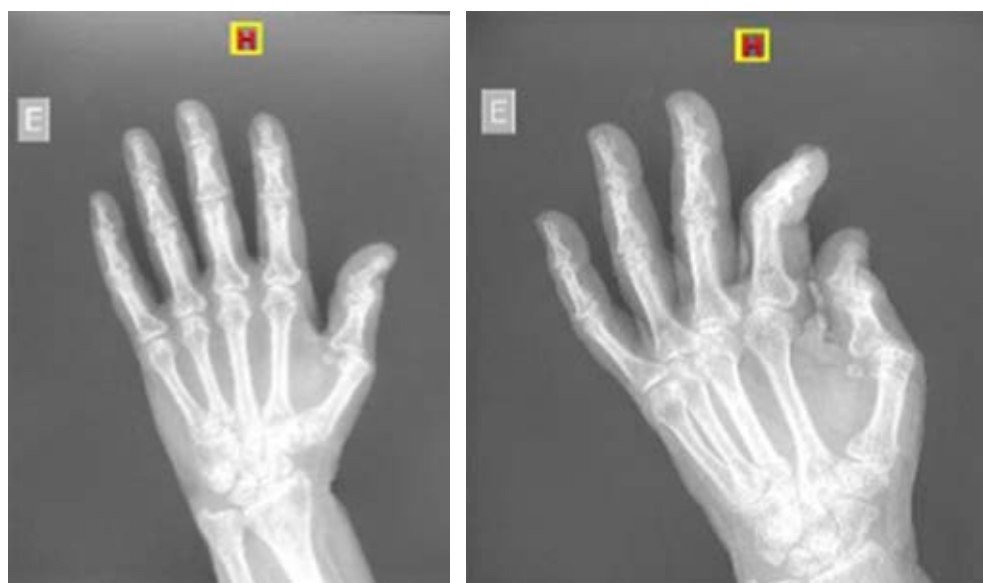


Figure 2:

X-rays in the Emergency Department. Volar metacarpophalangeal dislocation of the thumb was observed (pa and oblique).



Figure 3: Herniation of the metacarpal head through the intraarticular dorsal capsule, ulnar dislocation of the extensor pollicis longus (EPL) and extensor pollicis brevis (EPB).



Figure 4: Reduction after dislocation. Rupture of the ulnar collateral ligament.

brevis (EPB) (Figure 3) and rupture of the ulnar collateral ligament (UCL) (Figure 4), all these findings justify the impossibility to perform closed reduction.

The tendons were reduced from their most proximal area and the dorsal capsule was removed to achieve joint congruence. No involvement of the volar plate was observed.

The re-insertion of the UCL was carried out based on the proximal phalanx (FP) using a 1 mm 3/0 Juggler Knot (Figure 5).

The dorsal capsule was sutured using non-absorbable sutures.

After these gestures, joint stability was verified in the anteroposterior and varus/valgus planes, so it was decided not to use transfixing K-wires (KW) in the joint.

Plane closure was performed and a Zancolli's cast was placed for three weeks.

After six months of outpatient follow-up, the patient reported no pain or stability. She experienced a 10 degrees loss of extension or flexion with respect to the contralateral and maintained a grip strength similar to the contralateral (Figures 6 and 7).

She was able to perform basic activities of daily living without limitations.

The disabilities of the arm, shoulder and hand (DASH) score was 26/100 after six months and 10/100 after one year

Discussion

Volar MCF dislocation of the thumb is a rare pathology. The MCP joint of the thumb has little inherent bone stability.² The main stabilizers include the volar plate, the capsule, and the collateral ligaments.

The first case was described by Singhal in 1974.⁴ Subsequently, Gunter and Zielinski⁵ reported in 1982 a case of irreducible dislocation due to the entrapment of the EPL and EPB under the metacarpal head.

Few cases of this pathology have been described in the literature, showing similarities with our findings including herniation of the metacarpal head through the dorsal capsule, dislocation of the EPL and EPB tendons, and rupture of the CCL and volar plate. Of the cases described, only a few achieved closed reduction.^{4,6,7,8} Others recommend open reduction through a dorsal approach.⁹

In 2014, Senda and Okamoto⁹ described a new classification for this type of dislocations.

Type A (stable): they are generally solved through closed reduction, and remain stable afterwards. The mechanism of



Figure 5: After reduction and reinsertion of the ulnar collateral ligament using a 1 mm 3/0 Juggler Knot.



Figure 6: Radiographs after surgery.



Figure 7: Appearance six weeks postoperatory.

injury is usually passive hyperextension pressing on the back of the FP.

Type B (blocked): are the most common, are caused by hyperflexion or direct trauma on the back. Open reduction is required for all cases. In general, the outcome is a stable joint but with a 70% loss of range of motion compared to contralateral side.

Type C (unstable): they are associated with ligament injury and instability after closed reduction. When the collateral ligaments fail to stabilize the joint, the flexors predominate, bringing the thumb toward the palm. Open reduction and ligament repair are necessary to prevent volar subluxation of the joint. However, the outcome is not usually very optimistic, giving rise to stiffness, pain and loss of pinch force.

Our case is a type B, based on direct trauma to the back of the hand with soft tissue injury as described by other authors.¹⁰

The main complication of this pathology is the undiagnosed involvement of the UCL. Its exploration is important, especially in cases where a closed reduction is achieved² through valgus stress maneuvers in neutral position and 30° flexion. If an incomplete injury is suspected, immobilizing treatment will be necessary for four to six weeks.

If, on the contrary, in cases of suspected complete lesion of the UCL or a Stener lesion is suspected, open surgical exploration and repair are necessary.

A delay in the diagnosis and treatment of these injuries can lead to instability of the MCP joint and loss of pinching force. Moreover, late UCL reconstruction (> 3 weeks) has been shown to be more complex and has worse results compared to acute injury (< 3 weeks).¹¹

Although these injuries are infrequent, their treatment is a real challenge in which possible associated injuries must need to be considered in order to be able to treat them in the acute moment and obtain the best results in the short, medium and long term for our patients.

References

- Potini VC, Sood A, Sood A, Mastromonaco E. Volar dislocation of the thumb metacarpophalangeal joint with acute repair of the ulnar collateral ligament. *Case Reports Plast Surg Hand Surg.* 2014; 1(1): 5-7. doi: 10.3109/23320885.2014.965254.
- Moneim MS. Volar dislocation of the metacarpophalangeal joint. Pathologic anatomy and report of two cases. *Clin Orthop Relat Res.* 1983; (176): 186-9.
- Agha RA, Franchi T, Sohrabi C, Mathew G, Kerwan A; SCARE Group. The SCARE 2020 Guideline: Updating Consensus Surgical CAse REport (SCARE) Guidelines. *Int J Surg.* 2020; 84: 226-30.
- Singhal RK. Anteromedial dislocation of metacarpophalangeal joint of the thumb with special emphasis on its mechanism of injury. *J Indian Med Assoc.* 1974; 62(1): 18-20.
- Gunther SF, Zielinski CJ. Irreducible palmar dislocation of the proximal phalanx of the thumb—Case report. *J Hand Surg Am.* 1982; 7(5): 515-7. doi: 10.1016/S0363-5023(82)80051-8.
- Proubasta IR. Volar dislocation of the metacarpophalangeal joint of the thumb: report of two cases. *Bull Hosp Jt Dis.* 1993; 53(2): 13-4.
- Catalán-Amigo S, Pedemonte-Jansana J, Navarro-Quilis A. Simultaneous dislocation of both joints of the thumb with a fracture involving the interphalangeal joint. A case report and a review of the literature. *Acta Chir Belg.* 2007; 107(6): 728-30. doi: 10.1080/00015458.2007.11680161.
- Beck JD, Klena JC. Closed reduction and treatment of 2 volar thumb metacarpophalangeal dislocations: Report of 2 cases. *J Hand Surg Am.* 2011; 36(4): 665-9. doi: 10.1016/j.jhsa.2010.12.006.
- Senda H, Okamoto H. Palmar dislocation of the thumb metacarpophalangeal joint: Report of four cases and a review of the literature. *J Hand Surg Eur Vol.* 2014; 39(3): 276-81. doi: 10.1177/1753193413499291.
- Alioto RJ, Pellegrini VD Jr. Complex palmar dislocation of the thumb metacarpophalangeal joint. A case report demonstrating paradoxical function of the extensor pollicis longus. *Clin Orthop Relat Res.* 1993; (296): 118-21.
- Helm RH. Hand function after injuries to the collateral ligaments of the metacarpophalangeal joint of the thumb. *J Hand Surg Br.* 1987; 12(2): 252-5.

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