

Blocked Volar Dislocation of the Metacarpophalangeal Joint of the Thumb: Open Reduction with the WALANT Technique

Luxación Volar Bloqueada de la Articulación Metacarpofalángica del Pulgar. Reducción Abierta con Técnica WALANT

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Abstract

Keywords

- dislocation
- volar
- metacarpophalangeal
- thumb
- ulnar collateral ligament
- WALANT

We present the clinical case of a patient with a volar dislocation of the metacarpophalangeal joint (MCP) of the thumb in the left hand. The severe associated joint instability resulting from the rupture of the ulnar collateral ligament (UCL) and soft tissue interposition required an open reduction. For surgical revision, we used the WALANT technique, an anesthetic technique for upper limb surgeries showing significant advantages over the usual techniques.

Resumen

Palabras Clave

- luxación
- volar
- metacarpofalángica
- pulgar
- ligamento colateral cubital
- WALANT

Presentamos el caso clínico de una paciente que sufre una luxación volar de la articulación metacarpofalángica (MCF) del pulgar en la mano izquierda. Objetivamos la necesidad de reducción abierta dada la severa inestabilidad articular asociada, por la rotura del ligamento colateral cubital (LCC) y la interposición de partes blandas. Para la revisión quirúrgica utilizamos la técnica WALANT, técnica anestésica empleada en cirugías de miembro superior que está demostrando importantes ventajas respecto a las técnicas habituales.

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Introduction

A set of fundamental elements forms the metacarpophalangeal (MCP) joint of the thumb and allows its complete functioning: the volar plate, the capsule, and the collateral ligaments. MCP joint dislocations are rare, and most cases are dorsal dislocations. A search in the literature in English retrieved less than 30 studies, the first one dating from 1974.^{1,2}

In a volar dislocation, the joint injury usually results from the hyperflexion of the thumb or a force on the flexed phalanx.² Most volar dislocations require an open reduction due to the interposition of different elements in the MCP joint. Sometimes, the ulnar collateral ligament is damaged and needs review despite the successful closed reduction. The literature reports cases requiring ulnar collateral ligament (UCL) review 7 days after a closed reduction due to its subluxation and instability.² This condition needs correct treatment and follow-up as it is essential for pincer grasp and hand grip.²

We present the clinical case of a patient who suffered a volar dislocation of the metacarpophalangeal joint of the thumb in the blocked left hand that required open reduction in the operating room due to an associated rupture of the UCL and soft tissue interposition. For surgical review, we used the wide-awake local anesthesia with no tourniquet (WALANT) technique, an anesthetic technique for upper limb surgeries showing significant advantages over the usual techniques.

Clinical Case

A 59-year-old female patient suffered a fall from her own height and went to the Emergency Department 24 hours after trauma due to pain, severe deformity, and functional impotence in the first finger of her left hand. Examination and plain radiography (► **Figure 1**) showed a volar MCP dislocation of the first finger. Upon arrival, an attempt at a closed reduction with a trunk block was unsuccessful, so we decided on an open reduction and review in the operating room.

Under strict aseptic measures, we anesthetized the first finger of the left hand with the WALANT technique, thus avoiding the use of an ischemia cuff. WALANT is a local anesthesia technique with epinephrine. A mixture of lidocaine 1% and 0.0005 mg/mL epinephrine is diluted in 1 mL of 0.5 mmol/mL sodium bicarbonate for every 9 mL of lidocaine.^{3,4} Of the total diluted solution of 10.1 mL, we injected 0.5 mL under the dermis, 2 mL in the volar and dorsal zone of the proximal phalanx, and the remaining volume around the head of the first metacarpal bone.⁵ We performed a dorsoulnar approach on the first finger of the left hand at the MCP joint level. We observed a rupture of the dorsal capsule, ulnar dislocation of the extensor pollicis longus (EPL) and extensor pollicis brevis (EPB) tendons, and disinsertion of the UCL at the level of the base of the proximal phalanx of the first finger. First, we performed an open reduction of the joint, achieving self-reduction of the extensor tendons; next, we repaired the UCL with a 2.4 mm harpoon at the proximal



Fig. 1 Radiograph of a metacarpophalangeal volar dislocation of the first finger in the emergency room.

phalanx level. After the ligamentous and capsular repair, we asked the patient to move the thumb, flexing and extending the MCP. Since we noted persistent joint instability, we decided to add a percutaneous Kirschner wire to immobilize the joint (► **Figure 2**). The patient underwent immobilization with a spica cast for 4 weeks after surgery. Subsequently, we removed the immobilization and the Kirschner needle at the 1-month follow-up visit and placed an orthosis for 2 more weeks as protection.

Follow-up visits occurred at 1 month, 3 months, 6 months, and 1 year after surgery. She started with passive and active mobilization exercises with no resistance at 4 weeks at home, progressing to counterresistance exercises at 3 months. Since mobility evolved progressively and satisfactorily from the beginning, the patient did not require additional rehabilitation treatment. An exploration at 6 months showed MCP joint flexion of 60° and extension of 0°. The modified Kapandji index was 8 points. The patient had no pain, and the end-to-end pinch force was slightly lower than in the contralateral hand, at 5 kg (the pincer grasp strength in the right hand was 6 kg). The joint was congruent and stable both clinically and radiologically (► **Figure 3**). After 1 year, the patient remains asymptomatic, and we discharged her from follow-up visits.

Discussion

Senda and Okamoto classify the volar MCP dislocation into three categories: stable, unstable, and locked.^{1,2} Stable dislocations are successfully reduced in a closed approach



Fig. 2 Radiograph after urgent surgery.



Fig. 3 Radiograph 3 months after surgery.

and often present partial UCL injury, with no need for surgical treatment. Unstable dislocations allow a closed reduction but present complete UCL damage resulting in total joint instability; the lack of an open repair within 3 weeks leads to chronic instability, pain, and loss of strength. In a volar dislocation, it is essential to check joint stability after its reduction to avoid these issues. Lastly, blocked dislocations, such as the one observed in our patient, cannot be reduced in a closed approach because

there is generally an interposition of the EPL and/or EPB tendons in the joint and a complete UCL lesion requiring an open reduction and surgical repair.

In addition to the classification establishing the need or not for open reduction, some indirect signs guide us towards surgical treatment, such as radiological interposition of the sesamoid bones, EPB and/or EPL deviation, the impossibility of EPL palpation,⁶ and the paradoxical mobility of the MCP joint (MCP flexion with interphalangeal extension with the MCP joint in extension). In our patient, given the joint instability, especially in the valgus, the absence of extensor tendons on palpation at the dorsal level, and the impossibility of a closed reduction led us to perform an open reduction and lesion exploration in the operating room, ensuring UCL repair and its consequent contribution to joint stability.

Lastly, we highlight the use of the WALANT technique, characterized by the use of epinephrine with a local anesthetic agent, thus avoiding surgical bed bleeding and the need for an ischemia cuff, the main cause of pain during surgery. This reduces the pre-surgical stress of the patient, favors their collaboration during the intervention, and reduces the use of postoperative analgesic agents and the hospital stay.⁷

In addition, different studies concluded that using the WALANT technique in hand surgery results in the same outcomes, does not increase complications, and reduces surgical time, the material and personnel required for the procedure, and side effects from general anesthesia.^{3,4,8}

Therefore, we must not forget WALANT as an anesthetic technique in selected hand surgeries since it has significant advantages over general anesthesia without affecting patient comfort.

Conflict of Interests

Each author certifies that they have no business associations (for instance, consultancies, stock ownership, equity participation, patent/licensing agreements, etc.) that might pose a conflict of interest regarding this paper.

All authors contributed to the conception and design of the study. All authors performed material preparation, data collection, and data analysis. Beatriz Hernández wrote the first draft, and all authors commented on earlier versions of the manuscript. All authors read and approved the final manuscript.

References

- 1 Yüksel S, Adanır O, Beytemur O, Gülec MA. Volar dislocation of the metacarpophalangeal joint of the thumb: A case report. *Acta Orthop Traumatol Turc* 2017;51(04):352–354. Doi: 10.1016/j.aott.2017.03.014
- 2 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(01):5–7
- 3 Lied L, Borchgrevink GE, Finsen V. Wide Awake Hand Surgery. *J Hand Surg Asian Pac Vol* 2017;22(03):292–296
- 4 Lalonde DH, Wong A. Dosage of local anesthesia in wide awake hand surgery. *J Hand Surg Am* 2013;38(10):2025–2028. Doi: 10.1016/j.jhsa.2013.07.017

- 5 Lalonde D, Eaton C, Amadio P, Jupiter J. Wide-awake Hand and Wrist Surgery: A New Horizon in Outpatient Surgery. *Instr Course Lect* 2015;64:249–259
- 6 Beck JD, Klena JC. Closed reduction and treatment of 2 volar thumb metacarpophalangeal dislocations: report of 2 cases. *J Hand Surg Am* 2011;36(04):665–669. Doi: 10.1016/j.jhsa.2010.12.006
- 7 O'Neill N, Abdall-Razak A, Norton E, et al. Use of Wide-Awake Local Anaesthetic No Tourniquet (WALANT) in upper limb and hand surgery: A systematic review protocol. *Int J Surg Protoc* 2020;20:8–12
- 8 Maliha SG, Cohen O, Jacoby A, Sharma S. A Cost and Efficiency Analysis of the WALANT Technique for the Management of Trigger Finger in a Procedure Room of a Major City Hospital. *Plast Reconstr Surg Glob Open* 2019;7(11):e2509