Case Report
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Nonsurgical treatment of deep transverse metacarpal ligament injuries

Abstract

The deep transverse metacarpal ligament (DTML) is a structure that extends between the head of the second to fifth metacarpal to maintain the stability of the transverse metacarpal arch. Injuries of this ligament due to blunt trauma produce DTML injury and present with pain, decreased grip strength, deflection and diastasis of the affected fingers. Several surgical techniques for its reconstruction have been described. However, we evaluated the evolution of two patients who presented this injury diagnosed in acute and treated conservatively. Immobilization with forearm plaster in the intrinsic plus position and syndactyly to the adjacent finger was performed for 4 weeks. At one year of follow-up, they presented no pain (VAS 0/10) and showed hand function with comparable mobility to the contralateral hand and no diastasis between the fingers. We consider that in the face of DTML lesions evaluated in the acute period, diagnosis through clinical and radiological evaluation, as well as nonsurgical treatment, are usually sufficient.

Keywords: deep transverse metacarpal ligament, metacarpal instability, metacarpophalangeal joint, anatomy

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Introduction

The deep transverse metacarpal ligament (DTML) is a structure that extends between the head of the second to fifth metacarpal to maintain the stability of the transverse metacarpal arch.[1–3] Injuries of this ligament due to blunt trauma produce DTML injury and present with pain, decreased grip strength, deflection and diastasis of the affected fingers.[2,4] Several surgical techniques for its reconstruction have been described.[1–4] The aim of this paper is to evaluate the evolution of two patients who presented this injury diagnosed in acute and treated conservatively.

Case report

We evaluated the evolution of two blue-collar workers who presented in the emergency room after suffering trauma from a medium-energy crush on the back of the hand with his hand in an extended position. Clinically, they presented pain, swelling, and diastasis between the third and fourth finger in one case, and between the fourth and fifth finger in the second. X-ray showed in both cases diastasis between the third and fourth finger and metacarpals in the first case, while the second one showed diastasis between the forth and fifth fingers and metacarpals. No one did present associated bone lesions. MRI was requested only in the first case, showing edema at the DTML level, which suggests injury but without any characteristic finding (Figure 1). Immobilization with forearm plaster was performed in the intrinsic plus position and syndactyly to the adjacent finger was performed. After 4 weeks of conservative treatment, the cast was removed and occupational therapy with active and passive mobility began. Two weeks later, mobility against resistance was started. They returned to work 2 month after injury at the same level and without any complaint. At one year of follow-up, they presented no pain (VAS 0/10) and showed hand function with comparable mobility to the contralateral hand and no diastasis between the fingers (Figure 2).

Discussion

The deep transverse metacarpal ligament (DTML) is a structure that extends between the head of the second to fifth metacarpal, distributing forces to maintain the stability of the transverse metacarpal arch and allowing the grip strength.[1–3,5,6] Injuries of this ligament due to blunt trauma are rare and generally produced by axial crush mechanisms caused by trauma to the back of the hand.[2,3]

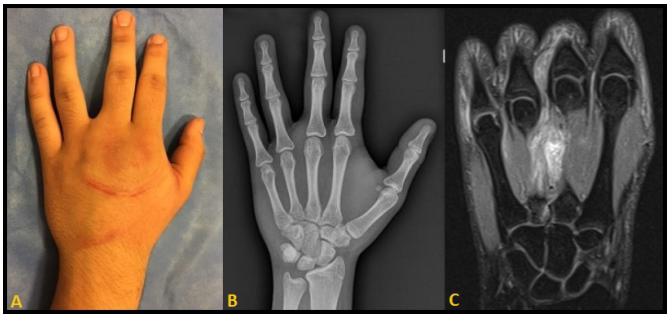

Figure 1 A, B) Clinical and radiographic images: diastasis between fingers. C) RMN: edema at the DTML.

Figure 2 Clinical images. Absence of diastasis and functional outcomes of the hand comparing with none injured hand.

The suggestive findings of DTML injury are pain, decreased grip strength, deflection and diastasis of the affected fingers that becomes more evident with digital flexion.[2,4] Magnetic resonance imaging (MRI) does not have a clear role in the diagnosis of the lesión because it is difficult to visualize the DTML, but it aids when the lesion is suspected and also allows ruling out collateral metacarpophalangeal ligament injuries.[1,3,7,8]

In the literature, several surgical techniques for its reconstruction have been described. Wheatley et al. presented two cases of DTML rupture between the 4th and 5th metacarpal, which showed objective ulnar deviation of the 5th finger and were treated surgically using primary DTML suture associating a reinforcement with A1 pulley.[3] Lee et al.[2] reported a DTML lesion between the 3rd and 4th metacarpal, showing diastasis between the corresponding fingers that was exacerbated during flexion. This case was also treated surgically by palmaris longus tendon graft and Kirschner wires.[2,4] Josty et al.[1] described a case of DTML injury affecting both sides of the 4th metacarpal generating hypermobility of the head of this bone, which was surgically resolved by DTML reconstruction with A1 pulley of the adjacent fingers and stabilization with pins.[1]

In our experience, we evaluated the evolution of two patients who presented this injury diagnosed in acute and treated conservatively. Immobilization with forearm plaster was performed in the intrinsic plus position and syndactyly to the adjacent finger was performed. In both cases, they evolved without complaints and their recovery was ad integrum.

For this reason, we consider that in the face of DTML lesions evaluated in the acute period, diagnosis through clinical and radiological evaluation, as well as nonsurgical treatment, are usually sufficient. In these cases, immobilization treatment and digital syndactyly seem to be sufficient to achieve adequate functional recovery in this type of injury.

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Conflicts of interest

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Ethical approval

The "Hospital Italiano de Buenos Aires" does not require ethical approval for reporting individual cases or case series.

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