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ORIGINAL ARTICLE

Luxation of the hand extensor tendons around the metacarpophalangeal joint

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KEYWORDS
Dislocation;
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Abstract
Objectives: Dislocation of the extensors over the head of the metacarpals constitutes a rare condition in patients who do not present rheumatoid arthritis. Nevertheless, with the increase in sport activities and especially those that demand a permanent physical contact, the number of cases has been increasing.
Methods: As far as treatment its goes, it is necessary to distinguish the acute cases (less than three weeks evolution) from the chronic ones as immobilization is usually sufficient in the first case. On the other hand, it is necessary to practice some type of operation in the second case.
Results: In the present work, the results obtained on three patients with this pathology on whom surgical centralization of the tendon by means of the Kilgore technique is made known.

PALABRAS CLAVE
Luxación;
Tendón extensor;
Nudillo del boxeado

Luxación de los tendones extensores de la mano a nivel de la articulación metacarpofalángica

Resumen
Objetivo: La luxación de los tendones extensores sobre la cabeza de los metacarpianos constituye una entidad poco frecuente en pacientes que no presentan una artritis reumatoide. Sin embargo, con el incremento de actividades deportivas, especialmente aquellas que exigen un contacto físico permanente, el número de casos ha ido aumentando.
Método: En cuanto al tratamiento se refiere, hay que distinguir los casos agudos (menos de tres semanas de evolución) de los crónicos, pues en los primeros casos suele ser suficiente la inmovilización, mientras que en los segundos es necesario practicar algún tipo de intervención quirúrgica.
Resultados: En el presente trabajo se dan a conocer los resultados obtenidos sobre tres pacientes con dicha patología y a los cuales se procedió a la centralización quirúrgica del tendón mediante técnica de Kilgore.

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Introduction

Tendon dislocation or subluxation over the metacarpophalangeal joint (MCP) —a condition eponymously referred to as "boxer's knuckle"—is a pathology rarely seen in patients who do not have rheumatoid arthritis.[1-3] The most common aetiology is traumatic,[4-6] although it may also be spontaneous (congenital)[7-10] and/or secondary to degenerative processes.[11]

For treatment purposes, acute cases (less than 3 weeks) must be distinguished from chronic cases because immobilization is usually sufficient in acute cases[6,12] while, in chronic cases, the dislocated tendon(s) must be surgically recentered.

In this extensive review of tendon dislocation over the MCP joint, we describe the specific anatomy involved, the aetiology and diagnosis of the condition, and treatment to be followed—primarily for chronic cases requiring surgical intervention. In addition, results are presented for 3 patients with this type of pathology who underwent tendon recentering using the technique described by Kilgore.[7]

Patients

Three female patients, 56, 72, and 81 years of age, underwent surgery for extensor tendon dislocation over the MCP joint. Except in the first case, where the onset of symptoms followed a contusion to the dorsum of the hand (although patient did not consult until 3 months after the accident), patients reported no history of trauma and had no known inflammatory condition. The middle finger was the one involved in all cases; in the eldest patient, the ring finger was also involved. The primary symptom was pseudolocking of extension following finger flexion, which caused limitation for patients in terms of carrying out their daily activities satisfactorily. In all cases, the tendon involved shifted to the ulnar side of the intermetacarpal space when the patient made a fist (fig. 1).

Conventional x-rays revealed no significant change, and no other types of imaging studies, such as MRI or ultrasound, were requested.

All cases were treated surgically using the technique described by Kilgore[7] in 1975.

Surgical technique

Under axillary block and with a pneumatic tourniquet, a zigzag incision is made across the dorsum of the MCP joint. If more than one finger is involved, as was the case with one patient in this series, a transverse incision slightly proximal to the metacarpal heads is preferred. After dissecting the resultant skin flaps, the extensor mechanism is exposed and the condition of the sagittal bands is determined along with tendon excursion upon flexion and extension of the MCP joint. In all cases, sagittal band attenuation and laxity were observed on the radial side as well as ulnar dislocation of the affected extensor tendon when the finger was passively flexed. Once dislocation is confirmed, a band is formed from the distal and radial base of the extensor tendon (fig. 2A) and made to pass between the radial lateral face of the metacarpal head and the radial collateral ligament (fig. 2B); subsequently, it is directed under the extensor toward the ulnar side (fig. 2C), laid across the tendon, and sutured to itself on the radial side using simple, 5-0 polypropylene sutures (Prolene* Ethicon, Inc.) (fig. 2D).

Figure 1 Ulnar dislocation (arrows) of middle and ring finger extensor tendon.

Once tendon stability is confirmed with both extension and flexion of the MCP, the skin is loosely closed with 5-0 Prolene, and the hand is immobilized using a forearm cast with the wrist in neutral position and the metacarpophalangeal joints at about 30° of flexion. Stitches are removed at 2 weeks, but immobilization is maintained for 2 more weeks, at which time the patient is started on recovery exercises.

The mean follow-up period was 8 months, and all patients were free of discomfort with full range of motion and no recurrence of the lesion (fig. 3).

Figure 2 Kilgore Technique. A) Formation of a radial band from distal base of extensor tendon. B) Passing the band under the radial collateral ligament (*). C) Tunnelling the band under the extensor. D) Suturing the band to itself on the radial side.

Figure 3 Clinical results of the case in figure 1. A) Finger extension. B) Finger flexion.

Discussion

The MCP joint extensor mechanism consists of the common digital extensor and transverse peripheral fibres commonly known as the sagittal bands (fig. 4).

Damage to these sagittal bands, as well as the presence of "juncturae tendinum," which are simply fibrous, intertendinous connections located proximal to the MCP joint, are evidence of extensor tendon dislocation over the joint.[13]

Four basic aetiologies of extensor tendon dislocation are recognized: inflammatory, traumatic, degenerative, and congenital. Inflammatory causes are the most common, rheumatoid arthritis being the cause in the majority of cases.[13] Next in frequency are traumatic causes; the incidence of these cases has been steadily increasing due to the large number of patients who participate in contact sports, especially boxing and the martial arts.[14-16] Legouest, in 1868, was the first author to describe traumatic dislocation of an extensor tendon; in 1930, Razemon compiled 17 cases with the same aetiology; and since that time, more and more cases have been published.[4,17,18] The mechanism of injury would be direct contusion of the MCP joint when it is fully flexed. In this position, either the sagittal band is damaged or, on the contrary—and primarily in the little finger—a capsular breach would occur with divergent dislocation of both the common and proprius extensor tendons and the sagittal bands left intact.[14]

The degenerative aetiology refers to the fact that tendon dislocation affects elderly persons, primarily women. One of our patients was an 81-year-old woman with 2 fingers affected and no history of trauma. The pathogenetic mechanism for extensor tendon dislocation would be the soft tissue atrophy that accompanies senescence, for this would foster attenuation of the sagittal bands. Extensor tendons would have a tendency toward ulnar rather than radial dislocation because, upon flexing the MCP joint, the vector of force moves in an ulnar direction and because the radial sagittal band is longer and thinner than the ulnar.[11,19]

Finally, a congenital aetiology (also called spontaneous) may be seen in patients in whom the juncturae tendinum are missing[20,21] or who have predisposing anatomical factors such as joint laxity, for example.[22]

In terms of gender, the majority of cases occur in women, with the middle finger being the one most commonly affected (48%), followed by the little finger (31%), the index finger (14%), and the ring finger (7%). Sometimes several fingers may be involved, as was the case with one of our patients. In almost all cases (9 out of 10), it is an ulnar dislocation of the tendon, although radial dislocation is common in the little finger.[23] Diagnosing finger extensor tendon dislocation usually presents no difficulty whatsoever. Clinically, when fingers are flexed, displacement of the tendon toward the intermetacarpal space is observed, as well as a protrusion when the affected finger is extended, which may be confused with a trigger finger. Even though there may be no specific radiological evidence of a dislocation, x-rays (AP and oblique) must be obtained to rule out any associated lesions, for these could condition the treatment to be pursued. In questionable cases,

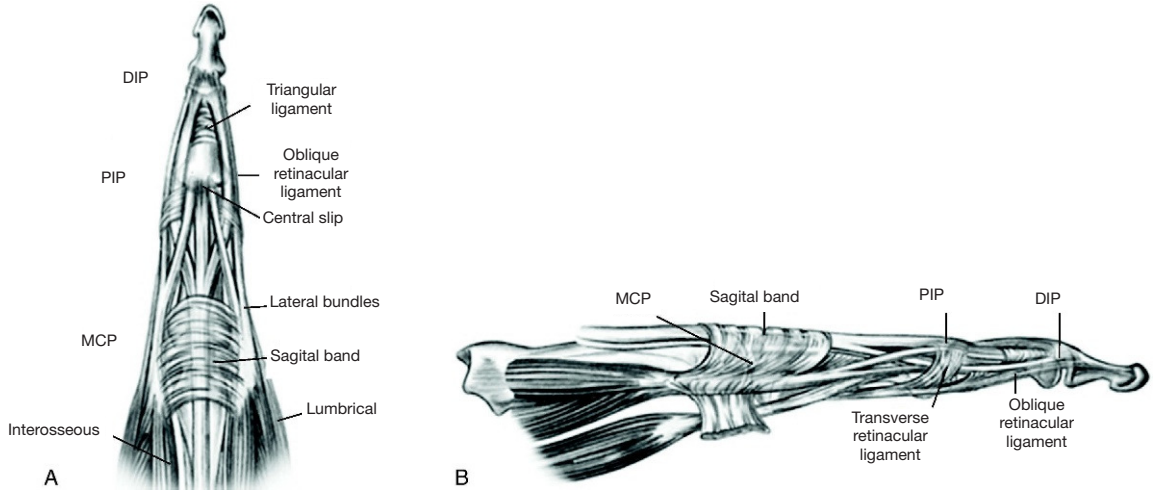

Figure 4 Normal anatomy of the MCP joint and sagittal bands of the extensor tendon mechanism. A) Frontal view. B) Lateral view.
DIP: distal interphalangeal joint; PIP: proximal interphalangeal joint; MCP: metacarpophalangeal joint.

Figure 5 Transverse dynamic ultrasound of the MCP area. A) With the MCP joint in neutral position, note the extensor tendon perfectly centred (arrow) over the metacarpal head (arrowhead). B) With the MCP joint in flexion, note the ulnar displacement of the extensor tendon (arrow) with respect to the metacarpal head (arrowhead).
Reproduced with permission of the publisher: López-Ben R, Lee DH, Nicolodi DJ. Boxer knuckle (Injury of the extensor hood with extensor tendon subluxation): diagnosis with dynamic US –report of three cases. Radiology. 2003;228:642-6.

however, dynamic ultrasound of the area may be ordered; this would confirm extensor tendon displacement in the affected finger when moving from an extended to a flexed position[24] (fig. 5).

Other studies, such as CT or MRI, usually contribute no information beyond that obtained by clinical examination and/or ultrasound, so these tests generally are not ordered.

As far as treatment is concerned, acute cases must be differentiated from chronic cases. The lesion is considered acute when it is diagnosed within 3 weeks of onset; beyond this period of time, it is considered chronic, which was the situation with our patients. In cases of traumatic origin, according to Rayan and Smith,[25] there would be 3 stages of extensor tendon dislocation (fig. 6). In stage I (mild), the traumatic mechanism would impact the extensor apparatus but without causing subluxation; in stage II (moderate), there would be tendon subluxation; and in stage III, complete dislocation would occur upon flexing the MCP joint.

In acute cases, regardless of lesion stage, the treatment of choice is immobilization via a plaster splint or orthosis, with the wrist in neutral position and the metacarpophalangeal joints in extension. The immobilization period is 3 weeks, after which the patient is started on functional recovery exercises.[12] In chronic cases, however, the patient must undergo surgery, as did the patients in this series. There are several tendon centralization techniques—from direct repair and/or plication of the radial sagittal band,[4] to creation of an extensor pulley from a paratendinous flap,[16] to tendon transfer using a lumbrical[26] or extensor[27] band. With this last technique, an extensor band is used to construct a loop that prevents ulnar displacement of the tendon by surrounding either the intermetacarpal ligament[27] or the radial collateral ligament[7]—a technique that bears Kilgore's name. In this small series, as in others previously reported,[28] this procedure has shown good results in every case, which suggests that it is a valid, easy-to-perform alternative in the treatment of chronic extensor tendon dislocation.

Figure 6 Classification of traumatic extensor tendon dislocations in the hand.

Evidence level

Clinical cases. Evidence level V.

Conflict of interest

The authors declare that they have no conflict of interest.

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