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CHIRURGIE DE LA main
Chirurgie de la main 34 (2015) 44–48

Clinical case

Tendon rupture of the flexor digitorum profundus of the little finger secondary to hamate non-union

Pseudarthrose de l'hamulus de l'hamatum responsable d'une rupture de tendon fléchisseur profond du cinquième rayon

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Received 31 May 2014; received in revised form 1 October 2014; accepted 5 October 2014
Available online 8 December 2014

Abstract

Several cases of hamate fracture and non-union have been reported. The hook of the hamate acts as a pulley for the flexor tendons for the little and ring fingers. Hamate non-union is frequently associated with irritation of the adjacent soft tissues. We report the case of hamate non-union that was only detected because of a flexor digitorum profundus tendon rupture in the little finger, associated with tendinopathy of both flexor tendons of the ring finger.

Keywords: Carpus; Non-union; Hamate; Flexor tendon; Rupture

Résumé

Plusieurs cas de fractures et pseudarthroses de l'hamatum ont été rapportés. Son hamulus agit comme une poulie de réflexion pour les tendons fléchisseurs des cinquième et quatrième rayons. Les pseudarthroses de l'hamulus de l'hamatum sont souvent associées à un syndrome irritatif des structures adjacentes. Nous rapportons le cas d'un patient présentant une pseudarthrose de la base de l'hamulus de l'hamatum, diagnostiquée à distance devant une rupture du tendon fléchisseur profond du cinquième doigt, associée à une tendinopathie des deux tendons fléchisseurs du quatrième doigt.

Mots clés : Carpe ; Pseudarthrose ; Hamatum ; Tendon fléchisseur ; Rupture

1. Introduction

Carpal bones fractures are common and mainly affect the scaphoid; the other carpal bones are not fractured as often. Hamate fractures only make up 2% of carpal fractures [1,2]. Fractures of the hook-like process of the hamate (hamulus) are rare. Tessier et al. identified 42 published cases in 1983 [3]. The most common complications were injuries to the neighboring flexor tendons (ring and little finger). Cases of irritation of adjacent nerve pedicles (ulnar and median) have been described on rare occasions, leading to entrapment neuropathy in certain cases.

This article reports the case of a patient who was diagnosed with hook of the hamate non-union only after finding a ruptured flexor digitorum profundus (FDP) tendon in the little finger and signs of flexor tendinopathy in the ring finger. The diagnosis was made 4 years after the initial injury event.

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http://dx.doi.org/10.1016/j.main.2014.10.147
1297-3203/

2. Case report

This was a 57-year-old, right-handed male patient who did not smoke and had no significant medical history. The clinical history went back to 2009, at which point the patient suffered an injury to his left hand while working with a tool. The patient had been treated with courses of non-steroidal anti-inflammatory drugs. Due to persistent pain, he consulted with a rheumatologist who twice injected corticosteroids into the metacarpophalangeal joint of the little finger; this provided transient pain relief but did not help him regain his strength. In March 2013, ultrasonography revealed tenosynovitis of the flexor tendons in the little finger. A/P and lateral radiographs were normal (Fig. 1A, B). An electromyogram (EMG) confirmed there was no peripheral nerve injury. He had been on sick leave for 3 months when he was referred to us.

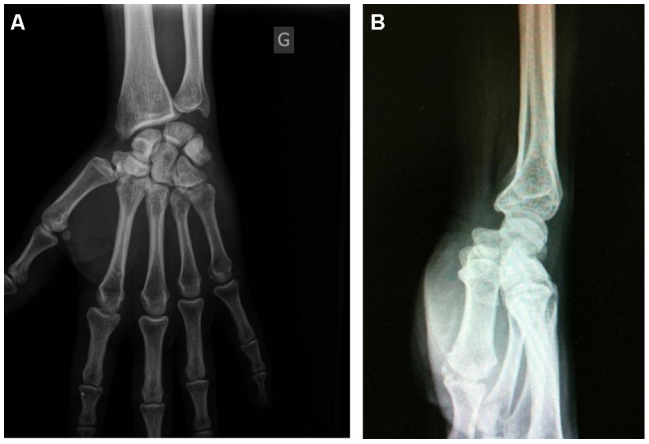

Fig. 1. A/P (A) and lateral (B) radiographs of the wrist.

Clinically, the patient had carpal pain during passive finger curling, which was reproduced by specifically palpating the volar side of the hamate. The passive range of motion of the finger joints was complete and painless. There was reduced active flexion of the distal interphalangeal (DIP) joint of the little finger, which the patient indicated was present before the corticosteroid injections (Fig. 2A), and loss of tenodesis grasp with absence of flexion in the fifth DIP joint (Fig. 2B) during wrist extension. His average muscle strength measured on a Jamar dynamometer was 38 kg for the right hand and 18 kg for the left.

A second ultrasonography exam revealed a rupture of the FDP tendon in the little finger with the proximal stump retracted to the distal volar wrist crease and the distal stump located at the shaft of the fifth metacarpal. CT scan revealed a non-union at the base of the hook of the hamate, with small subchondral cysts on both sides, but without osteophytes or condensation. The flexor tendons of the little finger and the FDP of the ring finger pass along the lateral side of this non-union (Fig. 3A). Magnetic resonance imaging (MRI) revealed additional injuries: tendinopathy of the flexor digitorum superficialis (FDS) of the little finger, tendinopathy of the FDP and FDS of the ring finger and subchondral cysts in the medial part of the head of the capitate (Fig. 3B–D).

Surgical treatment was performed on an outpatient basis with regional anesthesia and a tourniquet. The approach consisted of a Brunner zigzag incision over the non-union site (Fig. 4A). The hypothenar eminence and carpal tunnel were opened to assess the extent of the damage (Fig. 4B). Non-union at the base of the hook of the hamate was confirmed (Fig. 4C). The FDP tendon in the little finger had ruptured, while the FDP tendon in the ring finger was inflamed but still intact. There were visible signs of inflammatory tendinopathy. The hook of the hamate was excised and the non-union site was leveled to prevent the tendon from being damaged when it rubs against the remainder of the hook's base (Fig. 4D). The distal stump of the torn FDP was retrieved at the base of the fifth metacarpal and the proximal stump was retracted to the wrist and left in place (Fig. 4E). Because of the excessively large tendon defect, tenodesis of the distal stump of the torn FDP tendon to the FDS tendon was carried out by direct suture with a physiologically tensioned Pulvertaft weave (Fig. 5A, B). The repaired tendon was protected with a Duran brace for six weeks, which allowed for immediate protected mobilization.

3. Discussion

The hamate has a hook-like process called the hamulus. This process is thin and elongated. The hook of the hamate can be palpated 1.5 to 2 cm distal to the pisiform on an angled line drawn from the pisiform bone and the head of the second metacarpal [4]. It can be compared to the mast of a ship, to which the transverse carpal ligament and pisohamate ligament

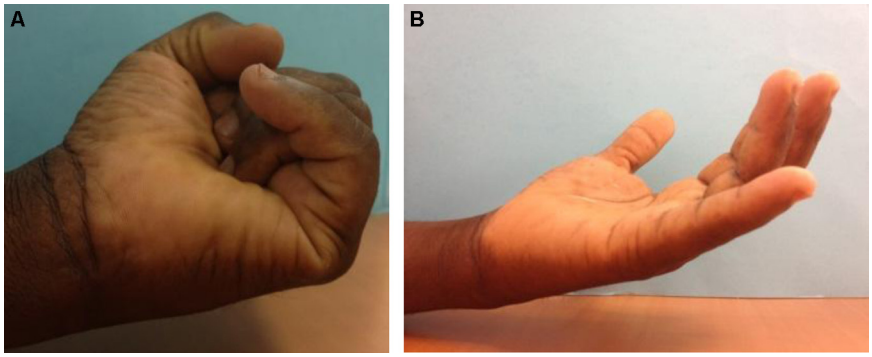

Fig. 2. Active flexion deficit of the DIP in the little finger (A) and loss of tenodesis grasp of the DIP in the same finger (B).