



Metacarpophalangeal Locking Syndrome of the Index Finger: A Case Report

Jade Nguyen and Sanjeev Puri*

Huntington Memorial Hospital, USA

Introduction

The presentation of a locking digit is a common encounter known to the plastic and orthopedic surgery world as flexor tenosynovitis or “trigger finger”. Far less encountered is locking of the Metacarpophalangeal Joint (MCPJ) in flexion without the ability to fully extend, appropriately named MCP Locking Syndrome. In contrast with trigger finger, flexion and extension of PIP and DIP joints are unaffected. Various etiologies have been described, such as a metacarpal head fracture [1], catching of the accessory collateral ligament on various structures including the metacarpal head [2,3], an osteophyte [4], or an intra-articular loose body [5], and sesamoid bone entrapment [6-8]. Two types of MCP locking syndrome have been classified by Posner et al. [3], type I defined as locking of MCPJ with further flexion possible and type II defined as locking of MCPJ with further flexion not possible. For example, there are reports of vertical locking of the MCPJ in which the small finger or thumb are stuck in 90 degree flexion without the possibility of further flexion, categorizing these cases as a type II MCP locking syndrome [9]. These severe cases were generally a result of direct trauma and did not occur in the index or middle fingers unlike the 80% of type I that do [2]. We present a case of type I MCP locking syndrome affecting the left index finger of a 29 year old post-partum female. Cause of symptoms was discovered to be sesamoid bone impingement.

Case Presentation

A 29-year-old right hand dominant female presented to the emergency department with complaints of left index finger pain and stiffness that started while attempting to open a jar. She described a sudden onset of sharp pain at the base of the index finger followed by the acute inability to extend the MCPJ past 30 degrees. On examination, attempts at passive extension revealed notable stiffness. The patient was unable to flatten her palm on the table. Flexion of the MCPJ was unaffected, as were function of the proximal and distal interphalangeal joints.

Radiographic examinations with XRAY and MRI as shown in Figure 1, 2, demonstrated a large sesamoid bone at the second MCP joint and diffuse edema superficial to the second flexor tendon complex suggestive of peritendinitis. Determining cause of symptoms was further complicated by the presence of a small fracture seen at the radial aspect of the second metacarpal. Closed reduction and a steroid injection were attempted in the emergency department and again a week later in clinic without improvement. In the setting of failed conservative management, the patient remained high risk for chronic flexor tendon injury from impingement. She was consented for left index finger

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*Correspondence:

Sanjeev Puri, Huntington Memorial Hospital, 100 W California Blvd. Pasadena, CA 91105, USA, Tel: (617)-605-4083; Fax: (626)-658-8917; E-mail: dr.jeev.puri@gmail.com

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Figure 1: Pre-operative MRI of left index finger demonstrating diffuse edema superficial to the second flexor tendon complex, suggestive of peritendinitis without tendon injury.



Figure 2: Pre-operative X-ray of left hand demonstrating sesamoid bone anterior to second metacarpal head. Small radial avulsion fracture of second metacarpal head is also visualized.

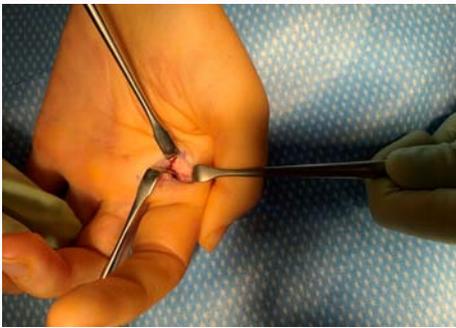


Figure 3: At operation the A1 pulley was released, permitting retraction of the tendons and visualization of the large sesamoid on the palmar surface of the metacarpal head.



Figure 4: Intra-operative excised sesamoid bone.

exploration with release of A1 pulley and excision of metacarpal sesamoid bone.

Surgical exploration was performed through a volar approach with a diagonal incision over the A1 pulley extending radially. Both collateral ligaments were observed to have signs of tendon sheath thickening indicative of mild tendinopathy. The C-arm was used to identify the large sesamoid sitting within the inferior portion of the solar plate as demonstrated in Figure 3. Circumferential dissection was performed with a scalpel and released from its attachments as shown in Figure 4. The area was then washed out copiously and the incision closed. Upon repeat intra-operative imaging, it was noted that the sesamoid bone present on pre-op X-ray was now absent



Figure 5: Post-operative X-ray of left hand once again demonstrating avulsion fracture of radial aspect of second metacarpal head, however with absence of sesamoid bone.



Figure 6: Near resolution of metacarpal locking of left index finger at one week post-operative follow up visit.

(Figure 5). There were no further signs of tendon catching; however there was mild residual stiffness noted with passive extension of the second MCPJ. This was attributed a combination of the avulsion fracture and arthritic changes. The hand was not immobilized and Occupational Therapy (OT) was to begin immediately.

Range of motion improved at her one week follow up (Figure 6); however there was pain and stiffness with minor catching at the radial aspect. With continuation of therapy, residual symptoms resolved by three weeks post-op. Full active/passive range of motion were achieved without pain or catching.

Discussion

MCPJ locking syndrome is a mechanical issue, usually caused by the accessory collateral ligament catching on a prominence in the metacarpal head. Type II, where further flexion is not possible, has been described most commonly in the small finger and thumb [9]. Type I, where further flexion is possible, generally manifests in the index and middle fingers and has a multitude of aforementioned etiologies.

Metacarpophalangeal locking caused by a sesamoid impingement, described before by Al-Qattan et al. [10], is rare. This is especially true

when observed in the index finger, as sesamoid bones are increasingly rare in this digit. Contrary to these cases in which subjects had spontaneous reduction and recurrence, our patient experienced an acute onset of symptoms without resolution of symptoms until surgical intervention. Her recovery without recurrence is reassuring that the sesamoid bone was the offender. The simultaneous metacarpal head fracture may have contributed to a slightly delayed recovery period, though is never considered to be the cause of her locking.

Management of this issue included a step-wise approach, from least to most invasive. Reports of successful closed reduction via gentle manipulation have been reported and recommended before [3]. Other studies recommend initial treatment with surgery due to the high recurrence rate with closed reduction [2,3]. A palmar approach, specifically, is recommended for all type II locking due to the fact that pathologic findings are most frequently encountered on this aspect of the hand [3].

In conclusion, leaving a locked finger untreated leaves the patient at risk for fixed flexion contracture with permanent disability. The timely diagnosis and treatment of type I MCP locking syndrome is imperative to a positive outcome.

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