Acta Scientific Orthopaedics (ISSN: 2581-8635)

Volume 7 Issue 8 August 2024

Case Report

Interphalangeal Sesamoid Bone as a Rare Cause of Bilateral Trigger Thumb

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Received: June 03, 2024

Published: July , 2024

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Abstract

Triggering of the thumb is a well-known condition in the current orthopaedic practice. Although most cases of triggering are idiopathic, some are caused by specific anomalies. We present a rare case of atraumatic, bilateral triggering of the thumb caused by a congenital sesamoid bone at the volar aspect of the interphalangeal joint. Sesamoidectomy resulted in immediate and sustained resolution of pain and clicking. In this article, we discuss a step-by-step surgical approach for sesamoidectomy while reviewing the more uncommon causes of triggering. We argue that a broad spectrum of etiologies should be included in the differential diagnosis when opting for surgery in the treatment of trigger thumb.

Keywords: Hand; Trigger Finger; Thumb; Sesamoid Bone; Interphalangeal Joint

Abbreviations

IP: Interphalangeal; MCP: Metacarpal Phalangeal

Introduction

Trigger thumb is a frequent and well-known condition in the current Orthopaedic practice. Primary triggering is initiated by an idiopathic tenosynovitis, causing the flexor pollicis longus tendon to thicken and eventually impinge under the first Annular (A1) pulley region [1]. Nevertheless, secondary causes can mimic triggering and should always be kept in mind when considering surgical treatment.

Sesamoid-related locking of the Interphalangeal (IP) joint of the thumb is rare. Review of the literature revealed only one case of atraumatic painful clicking of the IP joint [2]. More recently, three cases of posttraumatic sesamoid-related locking of the IP joint after hyperextension trauma were reported [3]. All four cases were successfully relieved by sesamoidectomy.

We present a rare case of atraumatic bilateral triggering of the thumb caused by an accessory sesamoid bone at the interphalangeal joint. Sesamoidectomy resulted in immediate and sustained resolution of pain and clicking. Extensive research of the literature has failed to reveal another paper of atraumatic sesamoid-related locking at the IP joint of both thumbs.

Case Report

A 39-year old right-handed female, in good general health and without any relevant medical history, presented with a six-month history of triggering of both thumbs. No history of trauma nor rheumatic condition was reported. Since she did not experience any benefit from previous corticosteroid injection at both A1 pulleys, a bilateral operative release of the A1 pulley was performed under local anesthesia without any particular difficulty.

Three weeks postoperatively, she returned to our consultation due to unresolved complaints of bilateral triggering. Subjective symptoms included clicking, popping, crepitus and locking at the IP joint with. Physical examination showed tenderness at the volar aspect of the IP joint with associated clicking and locking over the IP region. A well-healed scar without tenderness at the Metacarpal Phalangeal (MCP) joint was observed. Ultrasound examination revealed moderate tenosynovitis with normal mobility of both flexor tendons. Since no proper explanation for her complaints could be identified, physiotherapy including local anti-inflammatory treatment and stretching of the flexor tendon was initiated. However, five weeks later, she represented with unaltered clinical findings and persisting complaints of clicking. Further investigation using Magnetic Resonance Imaging (MRI) of the left thumb identified a sesamoid bone at the flexor aspect of the IP joint (Figure 1). The joint appeared normal. Inflammatory changes in and around the flexor pollicis longus tendon were noted.

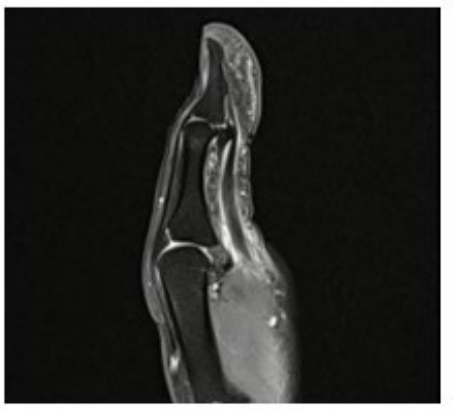

Figure 1: Preoperative magnetic resonance imaging of the left thumb showing an accessory sesamoid bone at the IP joint palmar plate of the thumb.

Subsequent open surgical exploration and resection of the sesamoid bones at both sides was performed under general anesthesia. A volar Brunner incision centered over the IP joint was made. Blunt dissection was used to spread to subcutaneous tissues. The digital nerves and vessels were identified and protected during surgery. The flexor pollicis longus tendon was exposed and retracted. Using the scalpel, a U-shaped proximal steeled incision of the volar plate was made, and the sesamoid bone was excised without any particular difficulty (Figure 2,3). A smooth passive mobilization of the IP joint became evident. The volar plate was repaired and sutured with simple stitches (Vicryl Rapide 5.0) (Figure 4).

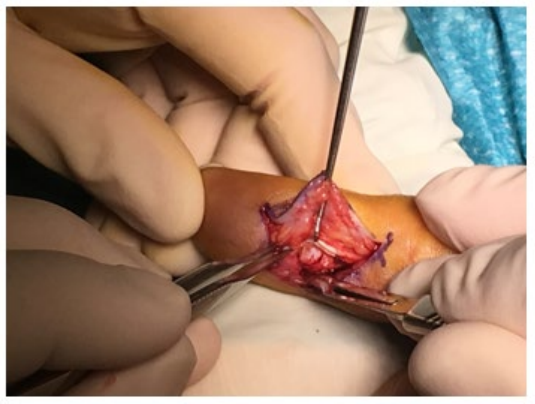

Figure 2: Retracting the flexor pollicis longus tendon identifies the sesamoid bone at the IP joint palmar plate of the thumb.

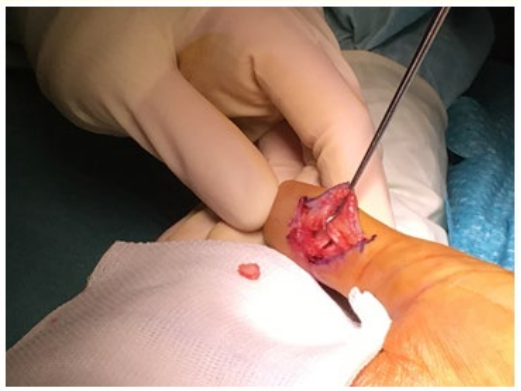

Figure 3: The sesamoid bone was smoothly excised using a U-shaped proximal-steeled incision of the volar plate.

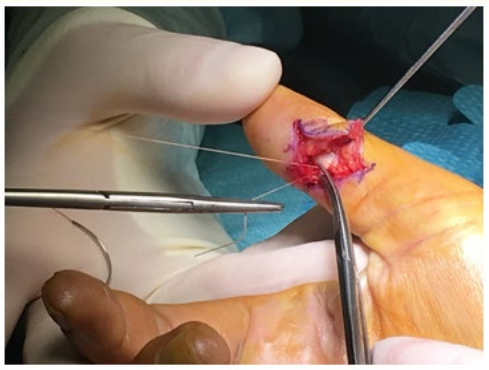

Figure 4: The volar plate was repaired and sutured using simple stitches.

Mobilization of both thumbs was instantly recommended to prevent the formation of adhesions. She experienced immediate resolution of clicking on both sides and the further postoperative course was uneventful. Six weeks after sesamoidectomy, some tenderness at the right IP joint was still present. Triggering remained completely absent with full and painless range of motion. The Kapandji opposition score showed a score of 9/10 at the right and 10/10 at the left side. Grip strength was 20 kg on both sides. Key pinch on the right side was 4 kg and 6 kg on the left. There was no need for further physiotherapy. She remained asymptomatic with a sustained resolution of pain and clicking during a four-month follow-up.

Discussion

Trigger thumb is a well-known and frequently seen condition, most commonly caused by tenosynovitis of the flexor pollicis longus with triggering at the A1 pulley. Nevertheless, a broad spectrum of etiologies at the MCP and IP joint should be included in the differential diagnosis when presenting with triggering. Intra-articular loose bodies, osteophyte formation due to arthritic conditions, snapping of the extensor pollicis longus on the base of the thumb metacarpal, instability and radial subluxation of the extensor mechanism on the dorsum of the MCP joint, snapping of the collateral ligaments over the prominent epicondyles of the MCP joint, an anomalous lumbrical insertion and neoplasms like a soft tissue chondroma can cause similar symptoms [2-5].

Painful locking of the thumb caused by a sesamoid bone at the interphalangeal joint is rare but can mimic a trigger thumb. Review of the literature revealed only one case of atraumatic sesamoid related locking of the IP joint.[2] More recently, Ecker., *et al*. reported three cases of posttraumatic clicking of the thumb IP joint, all developed following IP joint hyperextension trauma [3].

Sesamoid bones were first described by Galen who compared the small oval-shaped bones to sesame seeds [6]. However, their exact function is not yet completely understood, and several theories have been proposed. It is thought that they play an important role in trying to stabilize the joint, reduce wear and friction on the tendon as part of the lubricating mechanism, function as a fulcrum point, provide capsular strengthening to protect a joint from trauma and/or serve as a guide for the long flexor tendons in directing and controlling the course of the strings [7]. The reported prevalence rate of sesamoid bones at the IP joint of the thumb ranges from 5 to 100% [7]. It is a normal anatomical variation that is rarely symptomatic [3].

Anatomic dissection of several cadaveric thumbs established that the sesamoid bone at the thumb IP joint is located centrally within the palmar plate [2] and glides between the proximal phalangeal condyles with flexion and extension [3]. Consequently, changes in the relation of the sesamoid to the intercondylar groove can disturb this normal gliding mechanism. Anatomic variations in size, shape or position of the sesamoid bones or different orientation of the condyles can lead to mechanical dysfunction [2]. Likewise, injury can interact with the normal gliding mechanism. The sesamoid bone may become injured during hyperextension trauma [8] or posttraumatic irregularities of the articular surface can disturb their relation to the intercondylar groove. With flexion, the sesamoid can catch in the wedge of the intercondylar groove, it can impact on the base of the distal phalanx or changes at the head of the proximal phalanx may produce a clicking sensation of the thumb IP joint.

Painful thumb IP joint clicking can be difficult to diagnose. At clinical examination, tenderness and intermittent mechanical obstruction are located in the palmar aspect of the IP joint rather than the MCP joint. X-ray and ultrasound can be helpful to diagnose the presence of a sesamoid bone or to exclude other causes.

Tangential views are valuable to reveal most sesamoid bones since in conventional X-ray analysis sesamoid bones may be masked by larger bones [3]. If inconclusive, additional Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) could be used to further investigate and exclude other causes. Digital Tomosynthesis (DTS) constitutes a new imaging technique with higher detection rates for sesamoid bones of the hand than conventional X-ray (prevalence 75% on DTS vs. 53% on conventional X-ray). By the use of thin image slices similar to CT with high in-plane resolution, DTS gives detailed images of the bone. Moreover, there is a 20- to 50-fold dose reduction compared to CT and therefore Koo., *et al.* concluded DTS as safe and accurate modality for evaluating structures of the hand [9].

Conclusion

Even though primary idiopathic triggering explains nearly all cases of trigger thumb, we recommend that a broad spectrum of etiologies should be kept in mind. Special attention must be given to uncommon causes in patients with unresolved complaints after surgical release of the A1 pulley. Triggering secondary to a sesamoid bone in the IP joint is a very uncommon cause but can mimic a trigger thumb. Awareness and a high index of suspicion are necessary to reduce misdiagnosis and additional radiological investigation can be helpful to rule out any structural abnormalities. This case shows that sesamoidectomy is a safe option in the treatment with immediate and sustained resolution of clicking.

Acknowledgements

No acknowledgements.

Conflict of interest

No conflict of interest.

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