

CASE REPORT

Extensor digitorum brevis manus muscle in association with a metacarpal boss

John T. Capo¹, Ben Shamian² & Yinan Li²

¹Professor of Orthopaedic Surgery, Division of Hand Surgery, NYU Medical Center/Hospital for Joint Diseases, New York, NY, ²Department of Orthopedics, Division of Hand and Microvascular Surgery, UMDNJ-New Jersey Medical School, Newark, NJ, USA

Abstract

Awareness of the existence of accessory muscles in the hand, such as the extensor digitorum brevis manus (EDBM) muscle, is important when making a differential diagnosis and considering the treatment of mass lesions with similar appearances. Cases of EDBM with associated dorsal wrist ganglion have been reported in earlier published reports. This report describes an unusual case of the EDBM muscle in association with carpometacarpal (CMC) boss. To the best of the authors' knowledge this has not been previously reported.

Key Words: Carpometacarpal boss, extensor digitorum brevis manus muscle, ganglion cyst

Introduction

The carpometacarpal boss was first described by Fiolle in 1931 as a bony protuberance located on the dorsum of the hand at the base of the second and/or third carpometacarpal joint [1]. It tends to form in individuals in their early 30s on their dominant hand, with no male or female predisposition [2]. The aetiology of these carpal bosses has been mostly suggested to be either traumatic or degenerative in nature [1]. In addition, these benign masses have been described as being hard and bony in consistency, helping to distinguish them from similar dorsal hand pathologies such as ganglion cysts [2].

Although pain symptoms on presentation vary, it has been proposed that an asymptomatic boss may become symptomatic due to an extensor tendon rubbing against it, usually as the result of an extensor tendon subluxation [1]. Therefore, it is conceivable that an aberrant muscle overriding the boss can cause similar pathology and symptoms. In this case report, we describe an associated extensor digitorum brevis manus (EDBM) muscle occurring with a metacarpal boss. This aberrant muscle is a rare anomalous muscle found in the hands of ~ 2%–3% of the population [3]. The EDBM was first described by Albinus in 1734 [4], and functions as an accessory finger extensor in the 4th compartment of the dorsum of the hand. While associations between the EDBM and dorsal wrist ganglions have been widely reported [5], we found no reports of any cases associated to a metacarpal boss.

Case report

A 20-year-old right hand dominant male warehouse worker was referred to our clinic by an outside orthopaedic oncologist with a 3-month history of a progressively painful mass on his right wrist and the diagnosis of a tumour on the dorsum of the hand. On initial evaluation, a 1.5 cm palpable bony mass was noted over the base of the 3rd metacarpal of the right hand which was tender to palpation and slightly swollen. The patient also had

some soft-tissue swelling on the dorsum of his hand between the second and fourth metacarpals. He had full range of movement in his fingers, and was neurovascularly intact. Watson test was negative. His main complaints were tenderness and pain over the base of the third metacarpal.

Plain x-ray revealed a prominence of the 3rd metacarpal base but no obvious arthrosis (Figure 1). The patient came with an MRI, which showed an anomalous extensor digitorum brevis manus muscle over the dorsum of his hand (Figure 2). A computed tomogram (CT) scan was ordered to verify the metacarpal boss and assess the carpometacarpal (CMC) joint. This study showed a metacarpal boss within the third ray and a bridging osteophyte between the base of the third metacarpal and the capitate (Figure 3).

Initially the patient declined a steroid injection and opted for more conservative management consisting of splinting and NSAIDs. He had only mild temporary relief of his symptoms. He returned to our office 2 months later with worsening pain and limited wrist flexion and extension. At this point, he was given a steroid (Depomedrol) injection combined with local anaesthesia at the site of the metacarpal boss for pain relief. He had complete relief of his symptoms for ~ 1 month. Six weeks from the injection he returned to our office with complaints of returning pain and difficulty with function. He elected to proceed with an operation.

Operation

The patient was operated on for excision of the metacarpal boss and evaluation of the accessory muscle and possible excision. A 5 cm incision was made over the base of the third metacarpal. The long extensor tendons were examined, found to be intact, and retracted. The large accessory EDBM muscle was identified dorsally (Figure 4). It was ~ 6 cm in length, with its muscle belly attached to the capsule of the dorsal wrist proximally and its distal tendon was attached to the underside of the extensor hood

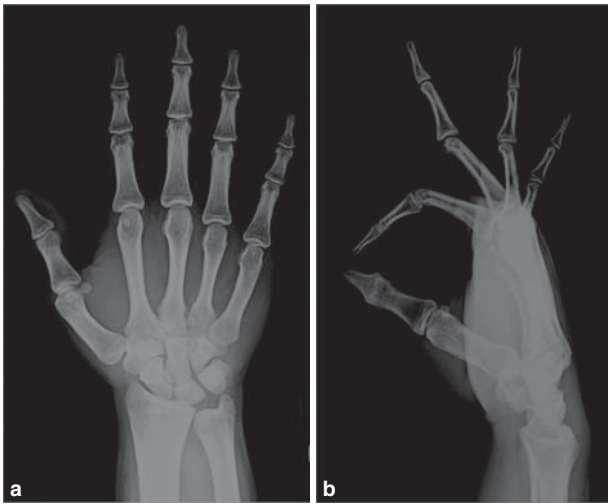


Figure 1. (a) Anteroposterior and (b) lateral radiographs of the hand showing a metacarpal boss at the base of the third ray.

of the third ray. The muscle was lying directly over the metacarpal boss. The muscle and distal tendon was then excised, and all vascular perforators were electrocauterised. The extensor hood was left intact and all extensor tendons were aligned well with no subluxation.

After excision of the EDBM, the metacarpal boss was seen. A longitudinal incision was made over the periosteum and the capsule revealing a large osteophyte on the third metacarpal extending to the capitate. This was removed with an oscillating saw and rongeur down to a smooth surface. The third CMC joint was seen and found not to be arthritic. The wounds were irrigated and bone wax was applied to the exposed cancellous areas of the metacarpal and capitate bones. The capsule was then repaired with 3-0 Vicryl sutures. The CMC joint was gently loaded and found to be stable. The wounds were irrigated and closure was performed with 3-0 nylon sutures. The wounds were dressed sterilely and the patient was placed in a well-fitting volar splint with his wrist in 25° extension and fingers free.

At his first follow-up examination, 2 weeks after the procedure, his sutures were removed and he was placed in a removable wrist splint. Occupational therapy was initiated to increase range of movement and gentle strengthening. The patient was



Figure 3. Sagittal and axial CT images show the metacarpal boss bridging between the third metacarpal and the dorsal capitulum.

last seen 6 months postoperatively and reported no pain in his hand or wrist. His incision had healed well and the area of the metacarpal boss was no longer tender. Range of movement testing showed wrist flexion of 80°, extension to 85°, pronation to 90°, and supination of 90°. Finger range of movement was full, with composite flexion into the distal palmar crease. His DASH (disabilities of arm, shoulder and hand) score was 1.7. Grip strength in his injured hand was 90% of the opposite side.

Discussion

The extensor digitorum brevis manus (EDBM) was initially described by Albinus in 1734. Although the EDBM muscle remains mostly asymptomatic throughout life, it can occasionally present patients with pain, especially in those who perform repetitive movements of the wrist and hand [6]. It originates at the dorsal wrist joint capsule and most commonly inserts in the index finger [7]. The blood supply and innervation are the posterior interosseous artery and nerve, respectively [7]. It has been shown to present in 2%–3% of normal hands [3], and is bilateral in ~ 54% of patients [4]. The EDBM may appear

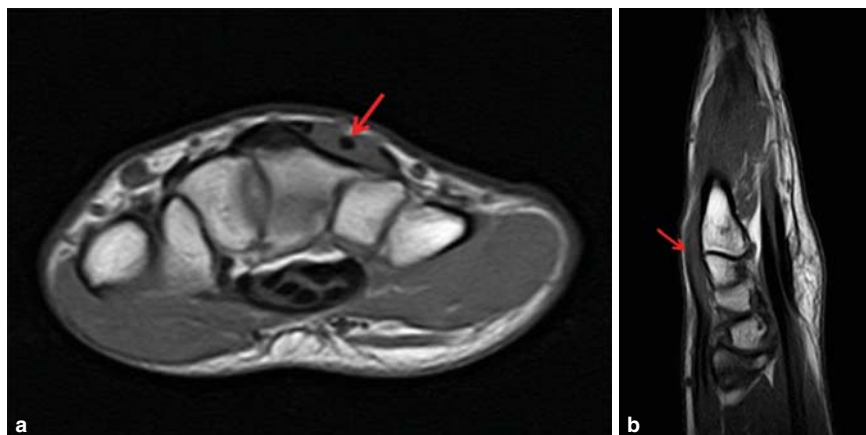


Figure 2. (a) Sagittal and (b) axial MRI sections of the hand showing the presence of an abnormal muscle overlying the third carpometacarpal joint. The axial cut demonstrates the extensor digitorum communis of the ring finger within the muscle belly.

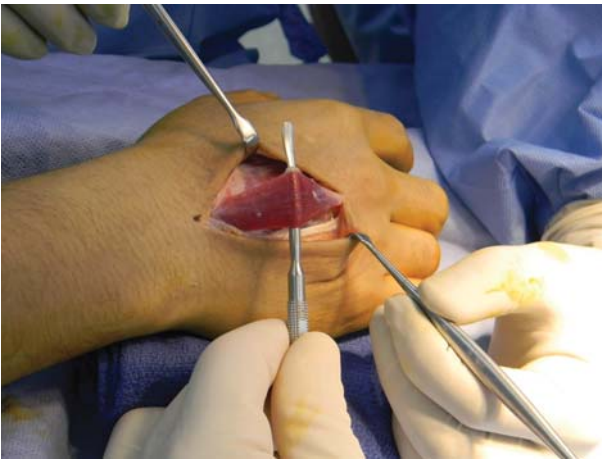


Figure 4. Intraoperative image showing the EDBM muscle with its proximal attachment to the dorsal wrist capsule and its distal tendon attachment to the extensor tendon hood still intact.

as a painful mass on the dorsum of the hand. Lack of awareness of its presence can result in it being misdiagnosed as a dorsal wrist ganglion, a tendon sheath cyst, synovitis, or a benign soft tissue tumour [7].

A carpal boss may also have symptomatic swelling and pain on the dorsum of the hand. When they do become symptomatic, it is believed that pain experienced by patients is attributable to either extensor tendon subluxation [1], or to the bony formation causing altered biomechanics of the nearby joints [8]. In our patient, we suspected preoperatively that the carpal boss was the main source of the patient's pain. The patient was employed as a warehouse worker, and his pain occurred only after heavy lifting activities. Upon reviewing the MRI, and discovering the EDBM, it became apparent that the cause of the pain was possibly also due to the muscle tendon unit rubbing over the boss and restricting range of movement. In light of these findings it was deemed necessary to excise both the muscle and the boss in order to completely alleviate the patient's symptoms.

A study conducted by Artz and Posch [9] evaluating the metacarpal boss revealed that, of a total of 47 patients, 22 were involved in occupations requiring repetitive movements, which cause stress at the site of the boss. They found that conservative treatment was sufficient for most cases, but their indication for operation included: persistent pain in the location of the carpometacarpal boss with motion and with repeated stress to the wrist sufficient to interfere with the patient's occupation; repeated bumping of the lesion in a patient whose occupation required that he work with his hands in close quarters, producing persistent pain in the region; and snapping

of the digital extensor tendons over the carpometacarpal boss causing sufficient pain and tenosynovitis [9]. At the end of the study, all patients were able to return to their original line of work postoperatively.

In published reports, there are several clinical reports that describe an EDBM associated with a dorsal wrist ganglion [10]. Dostal et al. [10] reported five cases with a dorsal wrist ganglion and an associated EDBM muscle. In all cases both the accessory muscle and the ganglion were both eventually excised and resulted in good resolution of symptoms. However, one case only had excision of the EDBM, had persistent symptoms, and required re-exploration at a later date for excision of the ganglion.

We describe an unusual case of a patient with an EDBM in association with a CMC boss. Excision of both structures resulted in an excellent clinical outcome. This aberrant muscle has been associated with ganglions, benign tumours, and accessory carpal bones. With this case we present the unique association between two uncommon anomalies of the hand in the form of a carpal boss and an EDBM. Hopefully, this information will assist clinicians in the diagnosis and treatment of unusual presenting swelling and masses in the hand.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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