

Case Report

DOUBLE-BELLIED EXTENSOR DIGITORUM BREVIS MANUS

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ABSTRACT

Most of the anatomical variations are noted during the cadaveric dissections. A rare variation of the Extensor digitorum brevis manus was observed on the dorsal aspect of the right hand of a 69-year-old male cadaver. This atavistic muscle had two bellies which originated from the dorsal aspect of the lower end of radius and the capsule of the wrist joint respectively. The two bellies fused to form a single tendon which inserted into the ulnar side of the dorsal digital expansion of the middle finger. Posterior interosseous nerve innervated the two bellies. This muscle may be involved in the wrist pain or may be misinterpreted as a ganglion or a nodule upon radiological examination. This muscle may be used for reconstructive purposes.

KEY WORDS: Extensor digitorum brevis manus, Fourth compartment syndrome, Posterior interosseous nerve, Wrist pain.

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BACKGROUND

The dorsum of the hand houses dorsal venous arch, twigs of cutaneous nerves and tendons of the extensor muscles of the forearm. It is devoid of any muscle bellies. The Extensor digitorum brevis manus (EDBM) is an accessory muscle of the dorsum of the hand which is found in 1%-3% of the cases [1]. This muscle, if present, is usually asymptomatic, but would cause pain in the dorsal aspect of the wrist due to undue extension of the wrist. Most of the cases that are previously reported, suggest the presence of a single belly with a single tendon [2, 3] or a single belly with two tendons of insertion [2, 4]. Here, we present a case showing two bellies of origin, fusing to form a single tendon.

CASE REPORT

During the routine cadaveric dissection for the undergraduates, unilateral variation was observed

in the dorsum of the right hand of a 69-year-old male cadaver. The EDBM with two bellies was observed. The muscle bellies overlying the 3rd and the 4th metacarpal bone was termed to be the lateral and medial bellies respectively. The medial belly took origin from the capsule of the wrist joint and the adjoining extensor retinaculum. The lateral belly took origin from the dorsal surface of the lower end of the radius. The lateral belly was bulky when compared to the medial belly. Both these bellies united to form a single tendon which inserted onto the ulnar side of the dorsal digital expansion of the middle finger. The muscle was placed between the Extensor digitorum tendons of middle and ring fingers. The average diameter of the lateral belly was found to be 1.4cms and that of the medial belly was found to be 0.6cms. The average length of both the bellies was 6.2cms and that of the tendon was 5.1cms. (Figure 1).



Fig. 1: Dorsum of right hand showing M – Medial belly of EDBM, L – Lateral belly of EDBM, ER – Extensor retinaculum.

DISCUSSION

EDBM is an accessory muscle of the dorsum of the hand. [1] Many previous authors have reported the presence of EDBM either unilaterally or bilaterally, irrespective of the genders [5, 6]. In the present case, the variation was unilateral, seen in a male cadaver.

The EDBM usually comprises of a single belly, but the presence of two bellies has been reported [1, 7]. The present case reports a similar finding.

The EDBM usually arises from the lower end of the radius, the ulna, metacarpals, some of the carpal bones, from the wrist joint capsule, distal radioulnar joint or from the extensor retinaculum of the wrist [1, 8, 9, 10, 11]. In the present case, the two muscle bellies took origin from the dorsal surface of the lower end of the radius, the capsule of the wrist joint and also from the extensor retinaculum.

The insertion of EDBM was predominantly onto the dorsal digital expansion of the index finger, the next would be onto the middle finger [12]. Insertions into the ring finger and little finger have also been reported very rarely [13, 14]. In the present case, the insertion was found to be onto the ulnar side of the dorsal digital expansion of the middle finger.

In a study conducted on 128 cadavers, only one female cadaver and two male cadavers showed the presence of EDBM [12]. In a study conducted on 72 upper limbs, EDBM was observed in three left upper limbs of male cadavers only [2]. Out of 286 cadaveric dissections only 3% of the hands exhibited the presence of EDBM [15]. EDBM was found bilaterally in about 1/3rd of the cases [1] and unilaterally in the dominant hand [16]. In the present case, the EDBM was seen in the dominant hand.

Embryological importance: According to Peeling [14], the EDBM is derived from the dorsal interossei muscle. But since the muscle is innervated by the posterior interosseus nerve, it may not be derived from the dorsal interossei muscle [16]. According to Bunnel [17, 18] and Souter [19], EDBM may be derived due to the failure of proximal migration of ulnocarpal elements of the antebrachial muscle mass in humans. This muscle is normally found in the amphibians which help in controlling the digits.

Clinical significance: The presence of EDBM would remain asymptomatic until any radiological examination or a cadaveric dissection is performed. Due to heavy manual labor as in pushing, the symptoms such as pain or swelling of the dorsum of the hand would be aggravated [20]. Presence of EDBM would be associated with the “fourth compartment syndrome” [21]. Since the muscle arises from the dorsal surface of the distal end of the radius, the fourth dorsal (extensor) compartment would be crowded due to the presence of four tendons of Extensor digitorum, tendon of Extensor indicis, Posterior interosseous nerve and artery along with the EDBM. During extension of the wrist joint there could be compression of the posterior interosseous nerve leading to pain in the fourth dorsal compartment [8]. EDBM would be misinterpreted in radiological examination to be a ganglion, a synovial cyst, a soft-tissue tumour or exostosis [16, 22]. EDBM has been used in the tendon transfer or graft surgeries to restore malfunctioning extensor muscles [23].

CONCLUSION

Although being an atavistic muscle, the EDBM is of great clinical importance for the surgeons in performing various graft surgeries and is also

of academic interest to the anatomists.

List of abbreviations:

EDBM – Extensor digitorum brevis manus

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Conflicts of Interests: None

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