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Extensor Indicis Brevis Muscle: Anatomical and Clinical Considerations

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During the routine anatomical dissection a rare muscular variant, the extensor indicis brevis muscle was observed of the left hand of an adult Caucasian male cadaver. The variant muscle originated from the joint capsule and ligaments of scaphoid and lunate ran across the third metacarpal and the second dorsal interosseous muscle and inserted as a single tendon to the ulnar side of the index extensor digitorum communis tendon. It was innervated by the posterior interosseous nerve. Different anatomical variations and the clinical importance of the aberrant muscle are also discussed.

Key words: extensor indicis brevis muscle, anatomical characteristics, clinical significance.

Introduction

Variations of the extensor muscles and tendons of the hand are very common. They are often discovered incidentally during surgery. However, these variations rarely could be associated with clinical significance, especially when the variant muscle impinge and occupy the narrow dorsal compartments of the wrist. The knowledge of the existing muscular variations of the hand and is mandatory in cases of reconstructive surgeries planned in this region [1].

The extensor indicis brevis muscle (EIB) is a variant muscle found on the dorsum of the wrist and hand. This muscle is found in approximately 2% to 3% of the population with a slight male predominance and is easily mistaken for other dorsal hand pathology [2, 8]. This variant muscle has been described mostly in cadaver dissections and rarely in distinct clinical case reports mimicking dorsal wrist ganglions [3, 5, 6, 9, 12].

In this report, we describe a rare case of EIB, review the current literature and emphasize on its possible clinical significance.

Case report

During a routine anatomical dissection, approved by the Medico-Legal Office and Local Ethic Committee, of the left upper extremity of a 69-year-old formol-carbol fixed

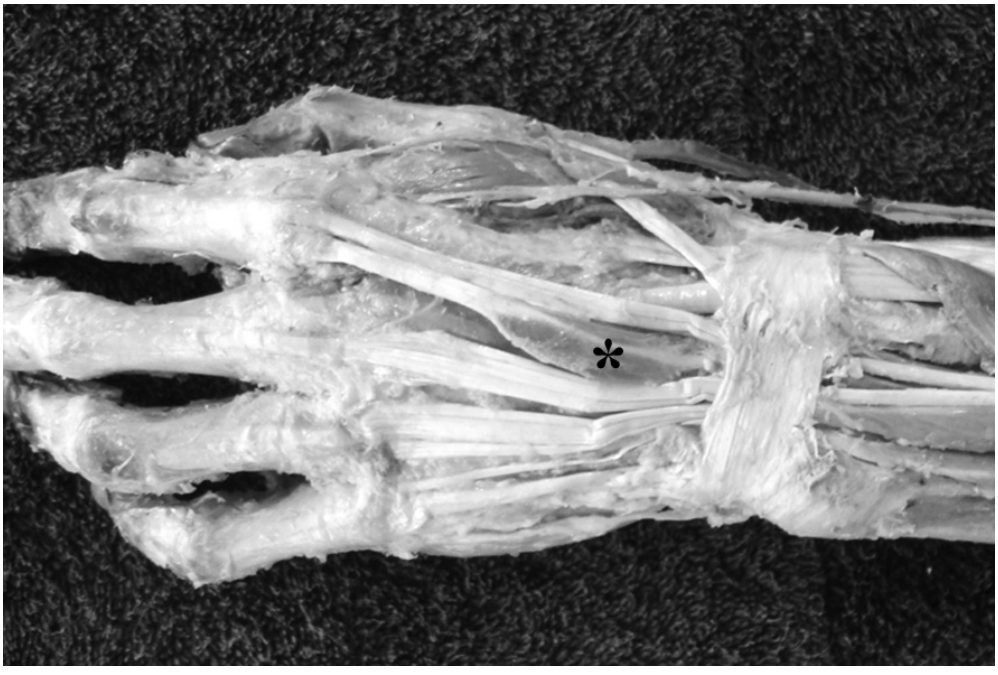

Fig. 1. Photograph of the extensor indicis brevis muscle (asterisk)

Caucasian male cadaver, from the autopsy material available at the Department of Anatomy, Histology and Embryology of the Medical University of Sofia, an unusual muscular variation was observed (**Fig. 1**). After the removal of the skin and superficial fascia, the extensor retinaculum was longitudinally opened to expose the dorsum of the hand. The variant muscle originated from the joint capsule and ligaments of scaphoid and lunate bones. It ran across the third metacarpal and the second dorsal interosseous muscle and inserted as a single tendon to the ulnar side of the index extensor digitorum communis tendon. The muscle belly was fusiform, 4.4 cm long and 0.55 cm wide. It was innervated by the posterior interosseous nerve and its blood supply was provided by the posterior interosseous artery. Due to its morphological characteristics, innervation, and apparent function we deem the muscle to be an EIB.

There is no information, concerning history of previous diseases for the dissected subject. No other clinical signs of trauma or surgical scars were noticed.

Discussion

Despite the fact that the muscle and tendon variations on the dorsum of the hand and wrist are common, the variation of the EIB reported here, is relatively rare. In 1734, Albinus was the first to describe this muscular variation [6]. The main contribution to the popularization of the term EIB is Kadanoff [4]. It is also known as extensor digitorum brevis manus muscle [12]. The EIB is thought to be atavistic and a remnant from the amphibians. The digital joints of amphibians are entirely controlled by intrinsic muscles, and the EIB could represent a homologue of the extensor digitorum brevis on the dorsum of the foot [11].

The EIB generally consists of a single belly, but cases with two bellies with variable sizes also have been reported [8]. Different variations of the EIB have been described. It could arise from the distal end of the radius, the dorsal radiocarpal ligament, the wrist joint capsule, the dorsal metacarpal surface or from the extensor tendons. Different insertions to the middle finger; to the second and third fingers; to the ulnar side of the middle and ring finger; one to the middle and two slips to the fifth finger; to the second, third, and fourth fingers have also been described. The most common insertion of this muscle was into the index finger, followed by that into the middle finger, and those into the index and middle fingers. The nerve and blood supply of the EIB have been ensured by the posterior interosseous nerve and artery [3, 5, 6].

Ogura et al. [7] classified this variant muscle into three types based on its insertion and relationship with extensor indicis proprius (EIP). Type I –inserted onto the dorsal aponeurosis of index finger with absence of EIP. Type II – together with both EIP inserted on the index finger. Type III – EIP inserted on the index finger and EIB inserted on the long finger [7].

The muscular belly of the EIB commonly lies distal to the distal edge of the extensor retinaculum. Usually, the clinical examination reveals an elongated swelling in the proximal part of the dorsum of the hand, between the middle and index finger extensor tendons. In clinical case reports, the EIB is commonly misdiagnosed as a dorsal wrist ganglion [5, 6, 9]. In the case of Murakami and Todani, together with a dorsal wrist ganglion an EIB was found lying over the ganglion [5]. Slavchev and Georgiev, also described a case of a ganglion cyst within the extensor digitorum brevis manus muscle diagnosed by sonography in an eighteen-year-old girl [10]. In some cases the EIB could be asymptomatic, whereas in others it may cause pain and swelling of the dorsum of the hand, especially in heavy manual workers [5, 6, 9].

In differential diagnosis, the EIB could also simulate an exostosis, a tendon sheath cyst, tenosynovitis of extensor tendons, a hemangioma, rheumatoid tenosynovitis or a benign soft tissue tumor [6]. For differentiation of the EIB from a ganglion cyst, a detailed clinical examination could be of use. In a case of an anomalous muscle, it usually becomes more prominent with active extension of the wrist and fingers, while the ganglion cyst is better outlined by wrist flexion [1]. The new imaging techniques such as magnetic resonance imaging could clearly identify the variant muscle [6]. Sonography readily detects fluid-filled ganglion cysts but it requires substantial operator experience to reliably visualize fine structures like aberrant muscles of the hand [10].

Knowledge of these variants is not only important for differential diagnosis of doctors but also might eliminate a surgical procedure.

In conclusion, the EIB is a muscle structure without essential function for delicate movements of the hand. To know this anatomic variation is important for the upper limb specialist not only for surgical procedures at the level of the hand but also because its hypertrophy can cause incapacitating symptoms.

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