

A Variant Extensor Pollicis Brevis Crossing the Anatomical Snuff Box

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During an educational dissection, accessory tendon of the extensor pollicis brevis muscle was found on the left side in a Korean cadaver. The abductor pollicis longus, extensor pollicis brevis, and extensor pollicis longus muscles showed normal morphology and course; however, narrow muscle belly originated between the extensor pollicis brevis and extensor pollicis longus muscles. It crossed the anatomical snuff box and then inserted on the base of the distal phalanx of the thumb. The author describes this previously novel case report and discusses the clinical implications of such a variant.

Keywords: Anatomical snuff box, Extensor pollicis brevis, Extensor pollicis longus, Variation

Introduction

The extensor retinaculum of the wrist forms the roof of six compartments. The first compartment contains the abductor pollicis longus (APL) and extensor pollicis brevis (EPB). The second compartment contains the extensor carpi radialis longus (ECRL) and extensor carpi radialis brevis (ECRB). And, the third compartment, the extensor pollicis longus (EPL); the fourth compartment, the extensor digitorum and extensor indicis; the fifth compartment, the extensor digiti minimi; and the sixth compartment, the extensor carpi ulnaris.

The first and third compartments of the extensor retinaculum of the wrist form the anatomical snuff box. The anatomical snuff box is a triangular deepening on the radial and dorsal aspect of the scaphoid and trapezium bones at hand. The medial border of the snuffbox is the tendon of the EPL. The lateral border is a pair of parallel and intimate tendons of the EPB and APL. While variations in the

anatomical snuffbox of the wrist may cause clinically significant problems, such variations may also serve as a potential source of transplant material, especially for tendon reconstructions. In these compartment, most frequent and disabling disease is de Quervain's stenosing tenosynovitis [1].

The number of fibro-osseous tunnels and multiple compartments in the first extensor compartment may be associated with a predisposition to de Quervain syndrome. So, variations in the tendons of the first compartment had long been studied to anatomists and surgeons [2-6]. At normal case, the APL originates in the proximal region of the dorsal surface of the radius, ulna and interosseous membrane, and it follows an inferolateral path and becomes superficial in the distal region of the forearm. There, it divides into two portions, which are inserted in the base of the first metacarpal and the base of the trapezium. The EPB originates in the distal region of the dorsal surface of the radius and the adjacent interosseous membrane and inserts in the base of the proximal phalanx of the thumb [3]. Multiple insertion-tendons in the first dorsal compartment of the wrist were demonstrated [4-6], but there was few reports about occurrences of these variations in Korean population.

In this article, we report rare morphology of the variation of the EPB and discuss the clinical significance of this variation.

Case

During a routine dissection of the wrist, variation of EPB was found on the left side of a 75-year-old male cadaver. After the skin, subcutaneous fat, and fascia the extensor retinaculum was longitudinally opened to expose the EPB, APL and EPL. Each muscle was carefully

examined. The findings were photographed. In the first extensor compartment, a common synovial sheath included the APL and EPB tendons, as expected. EPL arises from the dorsal surface of the ulna and from the interosseous membrane, next to the origins of APL and EPB. Between the EPL and EPB, additional muscle belly was found (Fig. 1). It crossed the anatomical snuff box superficial to the radial artery, and then, it was inserted on the base of the distal phalanx of the thumb with EPL. This variant muscle was innervated by the posterior interosseous nerve. Other variation was found in these extensor muscles.

Discussion

In the previous studies, the accessory tendon of EPB was found in 10.89% [7] and the variation types of the EPB muscle varied extremely [8,9]. The accessory tendons of EPB were found by Wood at first [8], however, there was few case reports in Korean cadaver. Moreover, this variant muscle continued to the anatomical snuff box and it was placed directly above the radial artery. Though various accessory tendons of EPB have been reported, these variant did not have a direct association with the radial artery.

The EPB is a clinically important anatomical structure because of its deep association with the de Quervain's stenosing tenosynovitis [1]. Operations designed to relieve the symptoms in stenosing tendovaginitis of the APL and EPB muscles involve surgical decompression of the osseo-fibrous canal in which the tendons lie. This canal, the first of the extensor tendon compartments at the wrist, usually contains these tendons in their respective synovial sheaths. Failure in this operation is common due to anatomical variations in these two tendons [10]. Therefore,

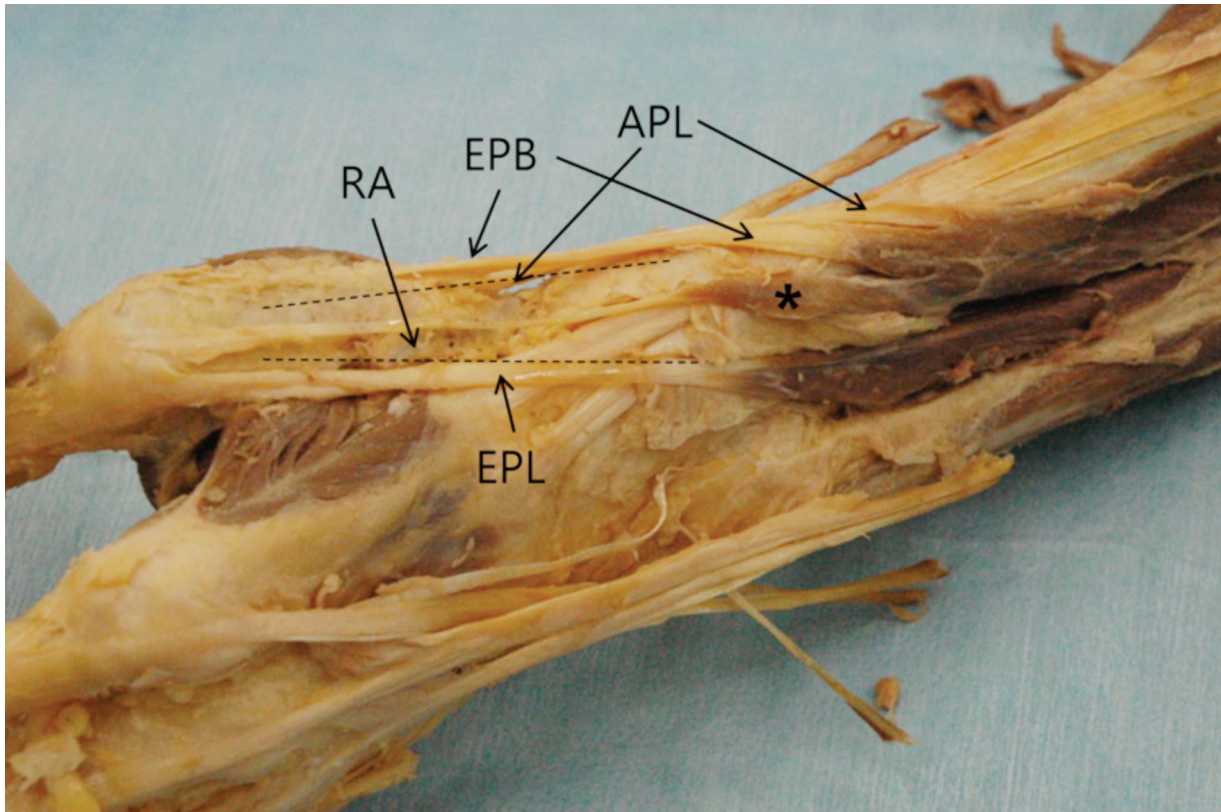


Fig. 1. Variant muscle (*) originated between the extensor pollicis brevis (EPB) and extensor pollicis longus (EPL). This muscle crossed the anatomical snuff box (dotted line) superficial to the radial artery (RA). APL: adductor pollicis longus.

proper recognition of the accessory tendon of these muscle is important for clinicians and surgeons.

To explain the embryological basis of the accessory tendon of the EPB, developmental aspects of the extensor muscle sheet of the forearm should be considered. The precursor extensor muscle mass of the forearm differentiates into three layers (1) a radial layer, forming the brachioradialis, extensor carpi radialis longus, and brevis; (2) a superficial layer becoming the extensor digitorum communis, extensor carpi ulnaris, and the extensor digiti minimi; and (3) a deep layer, abductor pollicis longus, extensor pollicis brevis on the radial side and extensor pollicis longus and extensor indicis

proprius on the ulnar side [11]. This study suggested that the development of deep layer seems to be highly unstable and still undergoing considerable evolutionary changes, considering its great variation in the different species of primates. Therefore, the extensor compartment of the forearm is one of the regions found to be frequent variations.

In this report, we demonstrated a variant EPB crossing the anatomical snuff box and the radial artery. In this region, trauma or clinical problems like radial artery aneurysm should be treated by surgical procedure [10]. Knowledge of the variations of the EPB is important for surgeons because the presence of the EPB variations

increases the incidence of iatrogenic injuries during surgery and invasive procedures.

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