



Bilateral anatomical variations in the first extensor compartment of the wrist and it's clinical importance

Ishwar B. Bagoji^{1*}, M. A. Doshi², Gavishiddappa A. Hadimani¹, Balappa M. Bannur¹ and B. G. Patil¹

¹Dept. of Anatomy, BLDE University's Shri B M Patil Medical College, Bijapur, Karnataka, India

²Dept. of Anatomy, Krishna Institute of Medical Sciences University, KIMS, Karad

ABSTRACT

Variations of the muscles and the tendons of the hand and the wrist are extremely important in hand surgery practice. The variety in the number of tendons and sites of insertion of the abductor pollicis longus (APL) and extensor pollicis brevis (EPB) muscle has been described in detail. The present case reports an unusual fusion of muscle bellies of abductor pollicis longus and extensor pollicis brevis with three separate tendons of insertion, the two tendons inserted into the base of first metacarpal and to proximal phalanx. The third tendon coursed in the narrow fibrous tunnel formed in the wrist and inserted on the base of the proximal phalanx. Awareness of these variations are critical when decompressing the first compartment for de Quervain's tenosynovitis or when selecting a tendon slip for transfer.

Key words: Abductor pollicis longus, extensor pollicis brevis, de Quervain's tenosynovitis.

INTRODUCTION

The first finger of the hand is functionally the most important finger; responsible for abduction of the thumb. The loose of the first finger's function affects 40-50% of the hand's function. Because of that, the study of the anatomic variations that affect the first finger's movements has large importance. Movements of the thumb are carried out by 4 intrinsic and 4 extrinsic muscles. The intrinsic muscles of the thumb are comprised of the abductor pollicis brevis (APB), opponens pollicis (OP), adductor pollicis (AP), and flexor pollicis brevis (FPB); the extrinsic muscles include the extensor pollicis brevis (EPB), extensor pollicis longus (EPL), abductor pollicis longus (APL), and flexor pollicis longus (FPL). Abductor pollicis longus muscle takes origin from the posterior surface of radial and ulnar shaft as explained in standard anatomy books [1]. The present case reports an unusual fusion of muscle bellies of abductor pollicis longus and extensor pollicis brevis with three separate tendons of insertion, the two tendons inserted into the base of first metacarpal and to proximal phalanx. The third tendon coursed in the narrow fibrous tunnel formed in the wrist and inserted on the base of the proximal phalanx. Anatomical knowledge of such variations may be clinically important for surgeons performing reconstructive hand surgeries in the extensor region of the hand.

EXPERIMENTAL SECTION

During routine dissection of a 63-year-old male cadaver, in the Department of Anatomy, BLDEU's Shree B M Patil Medical College, Bijapur, Karnataka, India, we came across the unusual fusion of the abductor pollicis longus and extensor pollicis brevis muscle were dissected on the both the hand. The muscle on each side of the hand studied in detail and appropriate photographs taken. The APL took origin normally, from the posterior surface of radius and ulna. The present article reports the anomalous fusion of APL and extensor pollicis brevis muscle (EPB) to form a

single well defined muscle belly. The latter exhibited insertion in the form of two tendons into the base of first metacarpal bone and the base of the proximal phalanx. The third tendon was very slender, arose from small slip of the APL and coursed in the narrow fibro aponeurotic tunnel formed deep to the extensor retinaculum and finally inserted to base of the proximal phalanx. Abnormal insertion of APL has often been reported, however, the abnormal insertion pattern of APL was also associated with abnormal fusion of APL and EPB.

Figure1: Photograph of dissected Right and left hand specimen showing the extensor tendons at the wrist



APL* (Abductor Pollicis Longus)
EPB** (Extensor Pollicis Brevis)
(Arrow) Anomalous tendon of APL

DISCUSSION

Early anatomy textbooks described the anatomy of the first extensor compartment as consisting of a single APL and an extensor pollicis brevis (EPB) tendon having insertions on the first metacarpal and proximal phalanx, respectively [2].

The Abductor Pollicis Longus is known to exhibit numerous variations of its insertion [3], and for this reason, studies about its origin aren't so frequent like studies about its form of insertion. The APL's tendon helps the stabilization of the carpometacarpal articulation of the first finger and is unique just in 30% of the cases, double in 50% and multiple in 20% [4], and it can exist until nine tendons [5]. The accessory tendons are found inserted in trapezia (30%), abductor pollicis curt (44%), opponens pollicis (16%) or linked to the thenar fascia. Presence of fused bellies and three tendons of insertion may be a contributing factor in the etiology of intersection syndrome. Surgical treatment of intersection syndrome usually involves rarity of unusual fusion of APL and EPB. Our present case presents rare occurrence of abnormal morphology and course of both muscles and hence is of immense clinical value. These aberrant tendons are clinically important because their presence can cause persistent pain after surgical division of the first compartment of the extensor retinaculum to treat thumb inflammation [6].

However, the presence of numerous tendons of insertion can increase the friction between them and cause an inflammation in the ossiofibrous tunnel of the abductor pollicis longus and extensor pollicis brevis in the first compartment of the extensor retinaculum contributing to the etiology of a syndrome named tenosynovitis of de Quervain [7].

Hence the Knowledge of these multiple tendons and variation in their distal attachments of the APL are essential in the treatment of de Quervain's stenosing tenosynovitis, in interposition arthroplasty, tendon transfer, tendon translocation and ligament reconstruction in arthrosis.

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