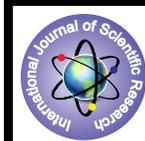


Variant attachment of bicipital aponeurosis and presence of supernumerary extensor tendon for middle finger - a case report



Medical Science

KEYWORDS : Bicipital aponeurosis, biceps tendon, flexor carpi radialis, extensor tendon, extensor digitorum

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ABSTRACT

During routine undergraduate dissection of upper extremity of 70 years old male cadaver in the department of Anatomy at M .G. M Medical College, Navi Mumbai, variation in the extensor tendon for middle finger and in the insertion of bicipital aponeurosis was noted.

Presence of additional extensor tendon slip for middle finger was noted on left side. We also observed on the same side that the bicipital aponeurosis gets its attachment on the proximal aspect of belly of flexor carpi radialis instead of blending with deep fascia of forearm.

Median nerve compression may occur as the nerve passes below the short distance bicipital aponeurosis which is attached to flexor carpi radialis. Awareness regarding such variations in the hand may be helpful for hand surgeons to understand the pathogenesis in case of median nerve compression also awareness of variation in extensor tendons may be important while performing tendon transfer and grafts.

Introduction

Extensor digitorum arises from the lateral epicondyle of the humerus via the common extensor tendon, adjacent intermuscular septa and antebrachial fascia and divides distally into four tendons, one to each finger except thumb¹. Wide documentation of variations related to origin, insertion and number is available. Variations not only provide additional information on the existing literature but also arouse a profound academic interest in clinicians. Usually there are incidental findings during routine cadaveric dissection and autopsies². Many times the presence of variations may be asymptomatic there by having lower chances for detection³. We have observed that one supernumerary extensor tendon for middle finger taking origin from lower part of interosseus membrane and inserted on middle finger on dorsal digital expansion.

Bicipital aponeurosis (BA) or lacertus fibrosus is the broad expansion of the biceps tendon. This expansion runs medially across brachial artery to fuse with deep fascia over the origin of flexor muscles of forearm¹. While approaching towards fascia covering flexor muscles BA passes above the brachial artery and median nerve. These two important structures get protection from BA. Some tendons and ligaments, therefore, flare out at their attachment site to gain a wide grip on the bone and have fascial expansions to the neighboring structures to reduce this stress, as in the case of aponeurosis of biceps brachii⁴.

Biceps brachii muscle which is chief supinator of forearm gets distal attachment on radius through biceps tendon and on ulna through BA. Thus through attachment of BA on the ulna, the distal end of it is drawn medially in supination. Also BA separates superficial median cubital vein from deeper brachial artery⁵. Any variation in the attachment of BA is clinically significant in terms of neurovascular compression and functioning

during supination. The bicipital aponeurosis may stabilize the tendon of biceps brachii distally. In doing so, it reduces movement near the insertion site and thus stress concentration at that site⁶.

The numerous variations reported in origin and in the present case we have found BA gets its attachment on flexor carpi radialis only without giving any attachment on the fascia covering flexor group of muscles of forearm on left side.

Though supernumerary extensor tendons are widely documented, presence of these tendons with variation of insertion of bicipital aponeurosis is not yet documented.

Such variations are clinically important for hand surgeons and orthopaedic surgeons.

Case

During routine undergraduate dissection of upper extremity of 70 years old male cadaver in the department of Anatomy at M .G. M Medical College, Navi Mumbai, supernumerary extensor tendon for middle finger was observed along with variation in the insertion of bicipital aponeurosis.

We have observed that one supernumerary extensor tendon for middle finger took origin from lower part of interosseus membrane and inserted on middle finger on dorsal digital expansion on left side (fig 1 and 2). Also bicipital aponeurosis which is an expansion from biceps tendon gets its insertion on flexor carpi radialis instead of blending with deep fascia of forearm on the left side (fig 3 and 4).

Figure 1



Figure 2



Figure 3

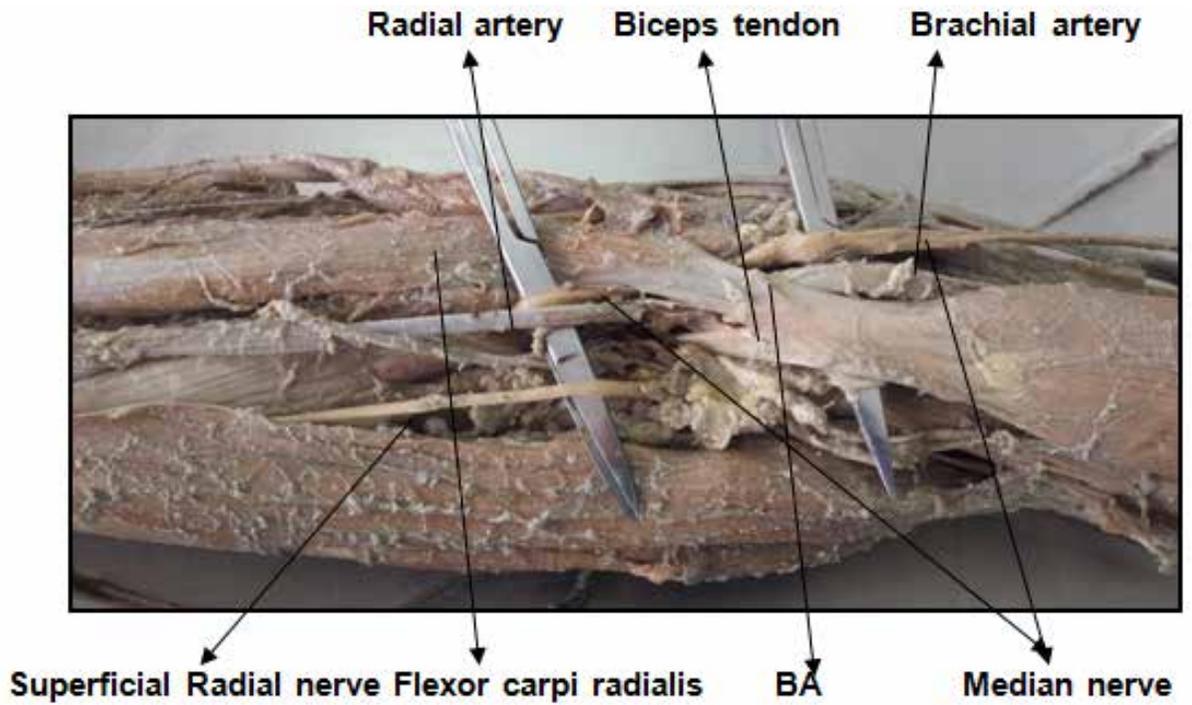


Figure 4



Discussion

Extensor digitorum arises from the lateral epicondyle of the humerus via common extensor tendon and the adjacent intramuscular septa. The digital attachments enter a fibrous expansion on the dorsum of the proximal phalanges [7]. Anatomic variations in the extensors tendons are common. Variations in the extensor tendons to the fingers have been documented for many years by many authors. In spite of that now a days many variations related to origin, insertion and number continue to be reported. Such variations not only provide additional information on the existing literature but also arouse a profound academic interest in clinicians.

Usually these are incidental findings during routine cadaver dissection and autopsies [8]. Many times the presence of variations may be asymptomatic, there by having lower chances for detection [3]. In the present case one supernumerary extensor tendon for middle finger was observed taking origin from lower part of interosseus membrane and getting inserted on the dorsal digital expansion of the middle finger. Presence of multiple tendons may alter the kinematics around the site of attachment to the phalanx [9]. The anatomical knowledge of the arrangement of extensor tendons and its morphological variations is important for hand surgeons performing tendon transfer and grafts and for orthopaedic surgeons while operating in forearm and on elbow joint. In addition, these variations in the musculature may also cause diagnostic perplexities while interpreting MRI or CT scans [10]. Not only sound knowledge of normal anatomy of extensor tendons of wrist is important but also awareness of occurrence of variations is clinically significant in tendon transfer operations.

Biceps brachii is a double headed flexor muscle of anterior compartment of upper arm, originates proximally with a long head from supraglenoid tubercle and short head from coracoid process of scapula. Distally these heads join to form a common tendon, which gets inserted to the posterior part of the radial tuberosity. Some aponeurotic and tendinous fibers gain inser-

tion into the bicipital aponeurosis [1]. Biceps brachii muscle was described as one with frequent anatomic variations [11]. Lot of literature is available regarding multiple heads of biceps muscle but very less documentation is available regarding variation in bicipital aponeurosis.

It was reported that BA in its proximal part is contributed by the short head and distally it was derived from the fascial sheath over the tendon of long head of biceps [2]. The bicipital aponeurosis may either be derived from long and short heads respectively in two distinct parts or may arise singly from interdigitating fibres of both heads [6]. A variant biceps brachii insertion in which some of the muscle fibres formed two tendinous slips. One slip passed superficial to the brachial artery and median nerve and merged with the fascia covering the flexor carpi ulnaris and the other slip passed deep to the nerve and the vessel and attached to medial supracondylar ridge of the humerus [13]. One case was reported in which a tendinous slip was originating from the undersurface of bicipital aponeurosis which became muscular and gave extensions to both pronator teres and flexor carpi radialis [10].

Variations in the BA will definitely alter the mechanics during supination. Such variations should be given importance as they may cause neurovascular compression. Also during interpretation of MRI and CT, such variations can cause confusion. Variations and their awareness is functionally as well as clinically very important.

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