

# Accessory Flexor Carpi Ulnaris (AFCU)

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## **Abstract:**

### **Introduction:**

*Variants of Flexor Carpi Ulnaris(FCU) are clinically important as they cause ulnar nerve compression. The present article is documented on the anatomical variation found during routine dissection. FCU had its normal origin and insertion while Accessory flexor carpi ulnaris (AFCU) was found with absence of palmarislongus (PL). Awareness of variations of FCU are helpful in reconstructive surgeries of forearm and hand.*

### **Method:**

*The right upper limb of a male cadaver was dissected during routine dissection in the Department of RachanaSharir, J.S. AyurvedMahavidyalaya, GujaratAyurved University. All superficial flexor muscles were exposed. The humeral and ulnar heads of FCU was dissected and AFCU was found having musculotendinous origin and central muscle belly inserting in the pisiform bone with the absence of PL. Relevant photographs were taken for documentation.*

### **Result:**

*The FCU has its normal origin and insertion. AFCU had a fleshy-tendinous origin having two heads, the small humeral head arising from the medial epicondyle via the common tendon whereas the ulnar head had its origin from the medial margin of the olecranon. This common tendon is long and continuous into the fleshy belly in the middle part of the muscle and inserted into the pisiform bone. Ulnar vessels and nerve lied lateral to the insertion of the AFCU. There was absence of PL.*

### **Conclusion:**

*The variation of AFCU is clinically important for surgeons doing flap surgeries, tendon transfer, for the surgeons dealing with cubital tunnel syndrome and in any operative procedure involving forearm and hand.*

## **Introduction:**

The presence of accessory muscles can be explained by the embryogenesis of muscle <sup>(1)</sup>. Myogenic precursor cells from somites migrate to the limb buds. Differentiated myogenic cells, guided by the connective tissue framework, coalesce to form two principal dorsal and ventral muscle masses that undergo a sequence of divisions and subdivisions to form the limb muscles.

Some of the muscle primordia disappear by apoptosis. Thus, the definitive form of the muscle depends on the migration, fusion, displacement, and apoptosis of muscle primordia. It may be clinically important for plastic surgeons doing flap surgeries and for the surgeons dealing with cubital tunnel syndrome. Orthopaedicians have used this muscle flap for treating nonunion of proximal ulna and hence knowledge of this variable head is important.

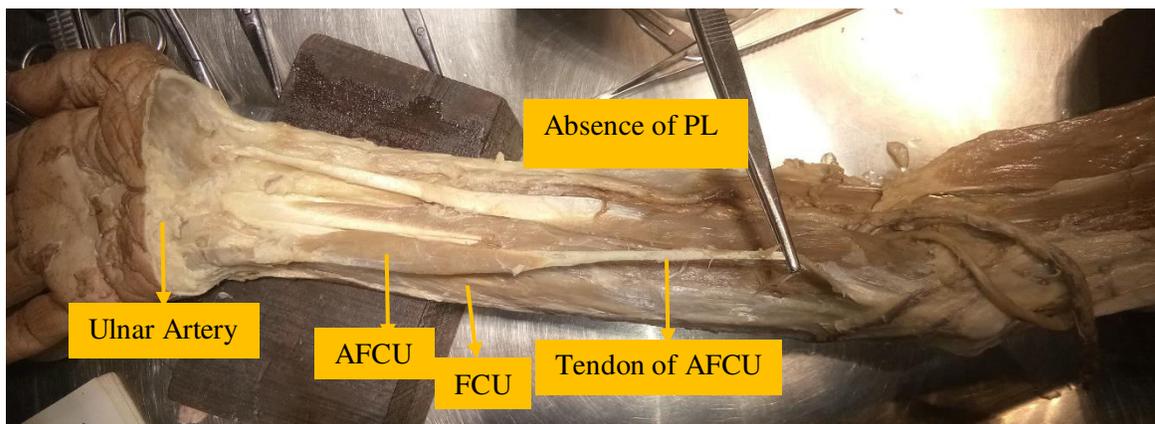


Figure 1- PL (Palmaris Longus), AFCU (Accessory Flexor Carpi Ulnaris) and FCU (Flexor Carpi Ulnaris)

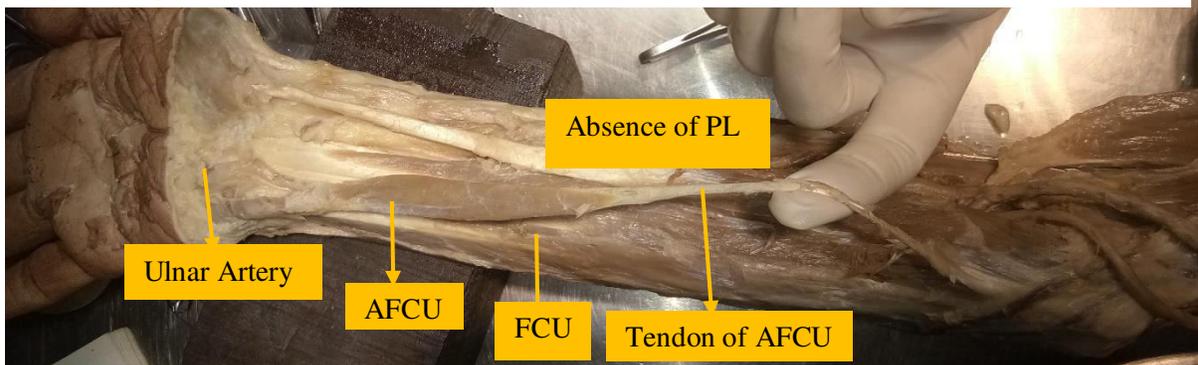


Figure 2 -PL (Palmaris Longus), AFCU (Accessory Flexor Carpi Ulnaris) and FCU (Flexor Carpi Ulnaris) ids,

humeral and ulnar, connected by a tendinous arch. The small humeral head arises from the medial epicondyle via the common tendon. The ulnar head has an extensive origin from the medial margin of the olecranon and proximal two-thirds of the posterior border of the ulna, anaponeurosis (which it shares with extensor carpi ulnaris and flexor digitorum profundus), and from the intermuscular septum between it and flexor digitorum superficialis. Occasionally there is a slip from the coronoid process. A thick tendon forms along its anterolateral border in its distal half. The tendon is attached to the pisiform, and thence prolonged to the hamate and fifth metacarpal by pisohamate and piso-metacarpal ligaments. The attachment to the flexor retinaculum and the fourth or fifth metacarpal bones is sometimes substantial.

Relations

The ulnar nerve and posterior ulnar recurrent artery pass under the tendinous arch between the humeral and ulnar heads of flexor carpi ulnaris. Ulnar vessels and nerve lie lateral to the tendon of insertion.

#### Vascular supply

The main arterial supply of flexor carpi ulnaris is derived from three pedicles. The proximal pedicle arises from a branch of the posterior ulnar recurrent artery as it passes between the humeral and ulnar heads. The middle and distal pedicles arise from the ulnar artery and enter the muscle at the junction of the upper and middle thirds, and the musculotendinous junctions, respectively. Flexor carpi ulnaris also receives a small supply near its origin which arises from the inferior ulnar collateral artery.

#### Innervation

Flexor carpi ulnaris is innervated by the ulnar nerve, C7, C8 and T1.

#### Action

Acting with flexor carpi radialis, flexor carpi ulnaris flexes the wrist. Acting with extensor carpi ulnaris, it adducts (ulnar deviates) the hand.

#### Clinical anatomy: testing

Flexor carpi ulnaris is tested by palpating its fibres while the wrist is flexed against resistance. A more positive test is to palpate the tendon while the patient abducts the little finger against resistance. FCU synergistically contracts to stabilize the pisiform, giving abducted digitiminimi a stable origin.

#### Case Report:

During routine anatomy dissections, we observed an Accessory flexor carpi ulnaris (AFCU) with the absence of palmarislongus in right forearm of male cadaver in Department of RachanaShareer, J. S. AyurvedMahavidyalaya, GujaratAyurved University. The FCU has its normal origin and insertion. AFCU had a fleshy and tendinous origin having two heads, the small humeral head arising from the medial epicondyle via the commontendon whereas the ulnar head hadits origin from the medial margin of theolecranon and proximal two-thirds of the posterior border of the ulna, anaponeurosis and from the intermuscular septum between it and flexor digitorumsuperficialis. This common tendon is long and continuous into the fleshy belly in the middle part of the muscle and inserted into the pisiform bone. Ulnar vessels and nerve were lying lateral to the insertion of the AFCU. It was also found that the palmarislongus was absent in the right forearm.

#### Discussion:

Variations of FCU are clinically important as they cause ulnar nerve compression.Niumsawatt *et al.* came across a single case of accessory FCU in 500 forearms examined<sup>(3)</sup>. They proposed a new classification identifying all the variations of FCU: aberrant origin, aberrant insertion, aberrant size or number of bellies, anomalous conjoined FCU, accessory FCU, and aberrant innervations. FCU is clinically important as it may be used as local flap, free flap, in tendon transferand also explored during decompression in ulnar nerve palsy.

Prevalence of absence of PL varies with different ethnic groups. Caucasian population (Hispanic – 14.9% and non-Hispanic – 13.1%) had a greater prevalence than the African-Americans (4.5%) and Asians (2.9%)<sup>(4)</sup>. PL is a slender, fusiform muscle in the forearm and is often absent unilaterally in African-Americans (4.5%) and Asians (2.9%).

The overall prevalence of absent PL (unilateral – 3.3%, bilateral – 1.2%) in Chinese population is 4.6%, which is quite low when compared to the Caucasian population<sup>(5)</sup>. As PL is an ideal donor for tendon transfer, this statistically significant lower prevalence in Asians could be valuable information in treating tendon injury.

### **Conclusion:**

The knowledge of variations of FCU hold utmost clinical importance and are not uncommon. In this study, we have found abnormal course of AFCU with absence of PL. It is clinically important for surgeons doing flap surgeries, tendon transfer, for the surgeons dealing with cubital tunnel syndrome and in any operative procedure involving forearm and hand.

### **References:**

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