



Gantzer of flexor pollicis longus — a culprit in Kiloh-Nevin syndrome

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Abstract

In a routine dissection conducted in the Department of Anatomy, Amrita School of Medicine, Kochi, a well-developed variant belly of the flexor pollicis longus muscle was noted.

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Introduction

Muscle anatomic variants are commonly encountered as serendipitous findings during surgery or routine dissections in medical schools. These variants may consist of absence of a muscle, supernumerary muscles, deviation from the normal course, or an unusual origin or insertion. While most such findings help adding to a compendium of variations for future academic dialogue, a mass effect of these variants may present as palpable swellings, frank compressive syndromes or at worst, veiled unexplained pain nagging the clinician and the patient and therefore their awareness has far reaching consequences.

Case Report

During routine dissection for the first year medical students at the Amrita School of Medicine, a well-developed accessory belly of the flexor pollicis longus (FPL-Ah) was noted under the flexor digitorum superficialis on the anterior aspect of the right forearm of a 64-year-old male cadaver. Its proximal attachment was on the medial epicondyle, it coursed downwards and laterally to get attached to the beginning of the FPL tendon on its medial aspect (Figure 1). It was supplied by the anterior interosseous nerve, which was seen posterior to the FPL-Ah. The median nerve was coursing in front of the FPL-Ah (Figure 2).

Discussion

FPL, one of the three deep flexor muscles of the forearm takes its origin from the anterior surface of the shaft of the radius and the adjacent interosseous membrane and is inserted into the base of the distal phalanx of the thumb [1].

Gantzer muscle is defined as an accessory muscle head connecting the superficial and deep flexors. This additional

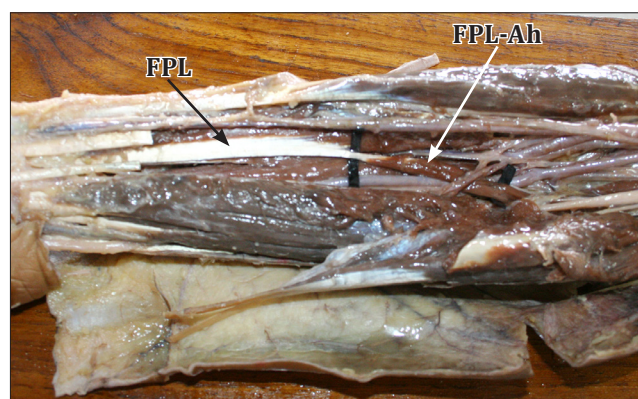


Figure 1. Photograph showing the origin of accessory belly of the flexor pollicis longus (FPL-Ah) and tendon of flexor pollicis longus (FPL) in the right forearm.

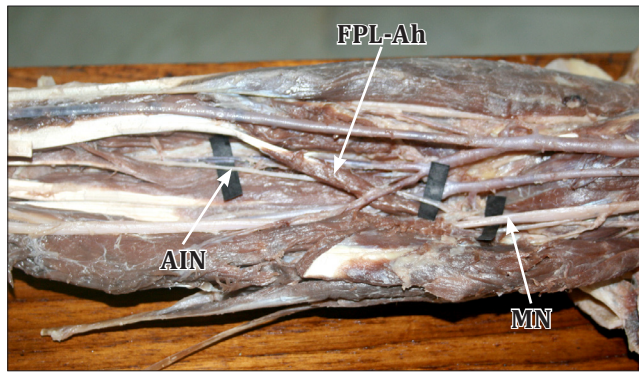


Figure 2. Photograph showing the relation of anterior interosseous nerve (AIN) to accessory belly of the flexor pollicis longus (FPL-Ah) in the right forearm. (MN: median nerve)

belly can either be that of the FPL or flexor digitorum profundus. It was first described by the German anatomist Carol F. L. Gantzer in 1813 [2]. Dykes and Anison in their exhaustive study showed the distribution of the Gantzer's muscle to be 28% on the right, 25% on the left and 18% bilateral [3]. In the present report FPL-Ah is on the right side.

The accessory origin has been cited by different authors to be from the coronoid process or from its medial border and even from the medial epicondyle [2, 4]. Its insertion has been cited by Mangini as the continuation of the tendon of the FPL [5]. In the study by Testut the distal attachment was at varying levels of the tendon of FPL [6]. Here the muscle was seen to be proximally attached to the medial epicondyle and the distal attachment was at the beginning of the tendon of the FPL and therefore similar to the study by Mangini.

The occurrence can be embryologically attributed to the development of the common flexors from the medial epicondyle which further differentiates into superficial and deep flexors. An incomplete delamination of this process results in FPL-Ah [2, 4].

The anterior interosseous nerve (AIN) was seen to be posterior to the FPL-Ah in the present case. Hemaddy et al. [7], Jones and Abrahams [8] found the nerve to lie posterior to the belly, whereas Dellon and Mackinnon reported that the nerve passed anterior to the belly [9].

If the AIN passes posterior to the belly, a complete AIN syndrome will result with ensuing weakness of the FPL, flexor digitorum profundus of the index finger (FDP- indicis), Flexor Digitorum Profundus of the middle finger and the Pronator Quadratus. An incomplete AIN syndrome will occur when the medial branch of the AIN to FDP alone is compressed under the belly. Spinner has identified at least eight anatomic features which predispose an individual to anterior interosseous nerve palsy one of which is the Gantzer's muscle [10].

The compression of AIN by any cause including the Gantzer's muscle clinically results in Kiloh-Nevin syndrome (AIN syndrome) which was first described by Parsonage and Turner in 1948 [11] and further elucidated by Kiloh and

Nevin in 1952 and bears their eponym [12]. Although it has sensory innervation to the radiocarpal, midcarpal and carpometacarpal joints it presents as purely motor deprivation affecting the FPL, lateral half of the FDP and the pronator quadratus. Weakness may initially be noted as clumsiness with writing and fine pinch activities like sewing. Deteriorating handwriting is a classical presentation. The weakness of the FPL and FDP- indicis can be clinically tested by asking the patient to make the 'Ok' sign, interphalangeal joint of the thumb and the distal interphalangeal joint of the index finger will be conspicuously extended. This is called the Spinner's test [10]. Lister states that the differential diagnosis to be considered is the rupture of the FPL or a locked trigger thumb or AIN compression [13]. Testing the function of the pronator quadratus is difficult and unreliable.

Conclusion

The presence of accessory muscles or supernumerary heads must be kept in mind while considering causative factors of neuropathies or other compressive effects. Prior knowledge of such possibilities is also relevant to surgeons during surgical approach of various joints. With the advent of advanced diagnostics like CT and MRI, such variations can be visualized prior to actual intervention and compared to those reported in literature resulting in better surgical outcomes.

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