

Case Report

NUMBERS MATTER : CLINICAL SIGNIFICANCE OF ADDITIONAL BELLY OF FIRST AND SECOND LUMBRICAL MUSCLES OF THE HAND

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ABSTRACT

In a routine dissection conducted in the Department of Anatomy, Amrita School of Medicine Kochi, additional origins of the first and second lumbricals were observed on the right hand of a male cadaver. The additional belly originated from the radial side of the tendon of flexor digitorum superficialis (FDS) of the index finger, deep to the flexor retinaculum. Distally the tendon of both bellies united and inserted to the dorsal digital expansion of the index finger. In the case of the second lumbrical the additional belly arose from the ulnar side of the tendon of Flexor digitorum profundus (FDP) of the index finger and inserted into the dorsal digital expansion of middle finger. Knowledge of possible variations helps the clinician find aetiology for various compressive syndromes so that treatment modality can be tailored and customised. This presentation will add to the compendium of information.

KEYWORDS: Additional belly, Flexor digitorum superficialis, Flexor digitorum profundus, Median nerve, Carpal tunnel syndrome.

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INTRODUCTION

The human hand is prehensile. The reason is the presence of numerous small intrinsic muscles in this region. The lumbricals are a set of muscles of this group responsible for fine and delicate tasks such as sewing and upward strokes of writing. The lumbrical muscles of the hand flex the metacarpophalangeal joints and extend the interphalangeal joints. They are unique in that they have no bony attachment - proximally they are attached to the tendons of FDP and distally to the extensor expansion and thereby connecting the flexors and extensors [1].

They are numbered from lateral to medial side as 1-4. The first and second arise from the radial side and palmar surfaces of tendons of index

and middle fingers respectively. The third is from the adjacent side of tendons of middle and ring finger and the fourth from adjoining sides of tendons of ring and little finger. They insert into the corresponding extensor expansion in the vicinity of the metacarpophalangeal joint. The first two are unipennate and the last two are bipennate [2]. The innervation of the lumbricals follows the innervation of the parent unit of the FDP and hence the first two lumbricals are innervated by the median nerve and the medial two by the ulnar nerve [3].

CASE REPORT

During routine dissection for the first year medical students of the Amrita School of Medi-

cine, Kochi, additional origins of the first and second lumbricals were observed on the right hand of a male cadaver. The origin of the first lumbrical was seen as a fleshy belly from the radial side of tendon of the flexor digitorum profundus (FDP) of the index finger. The additional belly was seen to originate at a more proximal level than the profundus belly. Its origin was seen as a thin tendon on the radial side of the tendon of flexor digitorum superficialis (FDS) of the index finger, deep to the flexor retinaculum. Distally the tendon of both bellies united and inserted to the dorsal digital expansion of the index finger (Figure 1).

The second lumbrical was seen on the radial side of the FDP tendon of the middle finger while its additional belly arose from the ulnar side of the tendon of FDP of the index finger, the additional belly being more proximal and in the carpal tunnel. The origins were both fleshy and the tendons of both bellies merged and inserted into the dorsal digital expansion of middle finger (Figure 2). The first and second lumbricals were innervated by twigs of the lateral branch of median nerve (Figure 3).

DISCUSSION

Variations in the origin and insertion are common and have been reported by several aut-

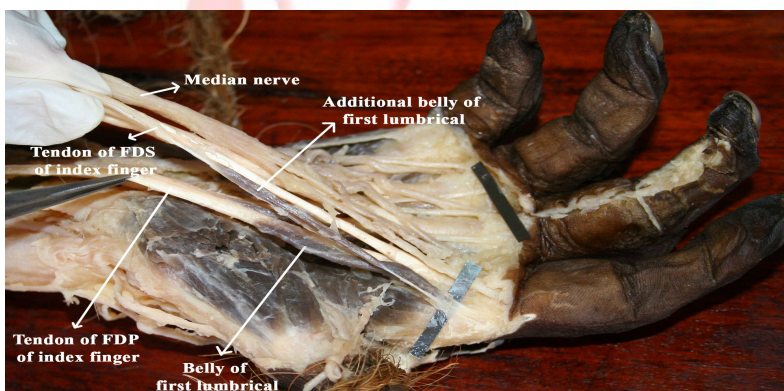


Fig. 1: Origin and insertion of first lumbrical and its additional belly.

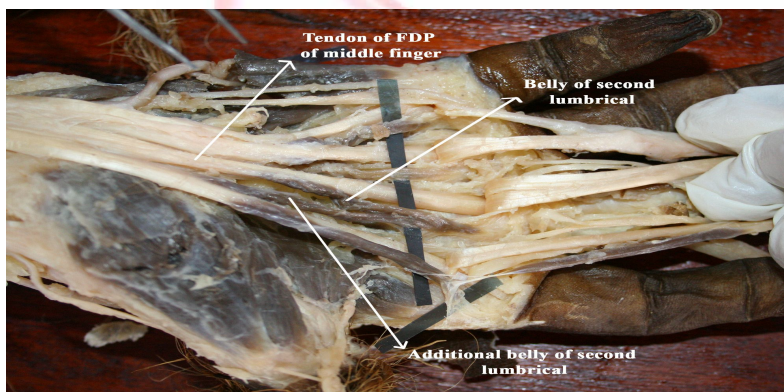


Fig. 2: Origin and insertion of second lumbrical and its additional belly.

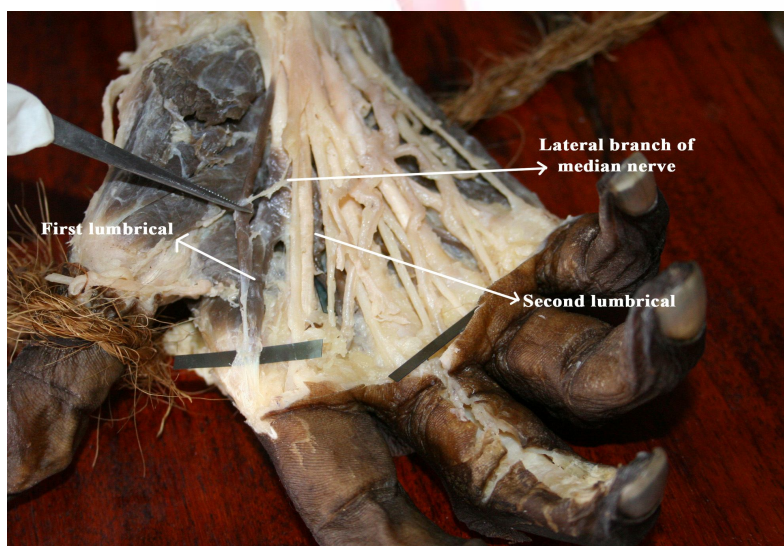


Fig. 3: Twigs from the lateral branch of the median nerve supplying the first and second lumbricals including their additional bellies.

hors [4, 5]. Incidence of additional belly is more than reduction in number [6]. It has been noted that the lumbricals may have an occasional origin in the forearm or from a metacarpal or from the superficial instead of the deep flexor tendons as in this case in the first lumbrical and that the third and fourth lumbricals may originate from a single tendon instead of two [7]. There have been instances of the origin of the first lumbrical from the flexor pollicis longus [8]. Phylogenetically FDS in mammals is homologous with the intrinsic musculature of the palm, and that it shifts its origin proximally in the forearm [9]. This accounts for the possible origin from the FDS.

CONCLUSION AND CLINICAL SIGNIFICANCE

Presence of an additional muscle belly for the first and second lumbricals as seen in the present case has immense clinical relevance as such an occurrence may compress the median nerve in the carpal tunnel due to the incursion of the muscle within the carpal during the finger movements or by hypertrophy of the lumbricals [10].

The treatment in such cases of Carpal tunnel syndrome would be incision of flexor retinaculum, release of the origin of muscle involved or even resection of the muscle involved [11]. Hence the clinician must be constantly aware of such possibilities, although preoperative diagnosis may be difficult.

Conflicts of Interests: None

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