

*Case Report***Presence of an Accessory Flexor Muscle in the Posterior Compartment of the Leg and Its Possible Clinical Complications - A Case Report**Mamatha Hosapatna^{1*}, Pallavi², Lakshmeesha Rao², Antony Sylvan Dsouza³¹Assistant Professor, ²Post Graduate Student, ³Professor and Head,
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ABSTRACT

Variations of the calf muscles are rare. One such variant muscle known as the flexor accessories longus seldom encounters in the posterior crural region. This accessory muscle is believed to be a causative factor for swelling or pain in the medial aspect of leg. Therefore prior knowledge of existence of aberrant muscle is pre-requisite for the surgeons, orthoedicians as well the radiologists while operating and interpreting the swelling in the medial side of leg or pain due to the entrapment of the tendon as in flexor hallucis syndrome. During the routine dissection of the lower limb for the medical undergraduate students, we came across such accessory muscle on the lateral side of the posterior compartment of leg. This variant muscle was present unilaterally and was bipennate origin from the lower part of medial inter-muscular septum and from the lower end of fibula of the right leg. It then passed deep to the flexor retinaculum and on entering the sole of the foot joined with a slip from the tendon of flexor hallucis longus to gain eventual insertion to the flexor digitorum accessories muscle.

Key words: Accessory muscle, flexor retinaculum, flexor hallucis longus, flexor hallucis syndrome**INTRODUCTION**

Deep muscles of the posterior compartment of leg include the flexor hallucis longus (FHL), flexor digitorum longus (FDL) and tibialis posterior. Anomalies of the calf muscles are rare. One such anomalous muscle occasional encounter in this region is popularly known as; the flexor accessories longus (FAL). This muscle is also named as accessories adaccessorium, accessories secundus or accessory flexor digitorum longus or pronator pedis. FAL is a highly variable slip,

both in its origin and insertion. When present, it arises from fibula alone, or from both the fibula and tibia together. It passes beneath the flexor retinaculum and end by joining the flexor digitorum accessories (FDA) muscle in the sole of the foot (Royana et al).⁽¹⁾

FAL muscles are believed to be a causative factor for, either a swelling in the medial aspect of leg in children or as pain in the medial side of the leg in case of muscle entrapment (Sookur et al., 2008).⁽²⁾ The course of the tendon has been reported to

pass beneath the flexor retinaculum of the foot after located in the pre-Achilles pad of fat of the lower calf. Thus, radiographically it may appear as a soft-tissue mass (Bergman et al., 1988).⁽³⁾

The function of the FDA is to correct the diagonal pull of the FDL into a direct plantar flexion of the lateral four toes along the long axes of the phalanges (Datta, 2004).

⁽⁴⁾ However, electromyography has proven that, its main function is to supplement the work of the FDL when more flexing power is required during bipedal progression together with the flexor digitorum brevis (Resser et al., 1983).⁽⁵⁾

Here we report an anomalous muscle of this type, but with some difference in its origin, which we came across during our routine lower limb dissection.

CASE REPORT

During the routine dissection of the lower limb of a formalin fixed male cadaver

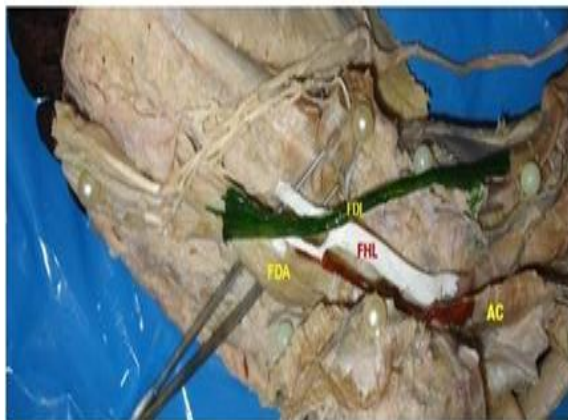


Fig 1: Dissection of the sole of right foot showing the course of tendon of accessory muscle (AC), which has been coloured brown. The neighbouring muscles flexor digitorum longus (FDL) is coloured with green and flexor hallucis longus (FHL) white in colour. FDA: flexor digitorum accessories.

DISCUSSION

The morphology of the flexor accessories longus is related to the phylogenetic history of the FDA. Wood Jones⁽⁶⁾ has documented phylogenetic background of FAL muscle as it is a

aged about 70years, we observed a bipennate, accessory muscle referred as flexor accessories longus (FAL) on the lateral side of posterior compartment of the leg. This variant muscle was present unilaterally and was originated mainly from the lower part of medial inter-muscular septum. Few fibres of it also took origin from the lower end of right fibula. The variant muscle was long and had slender tendon, measuring about 9cms. On its further course forward it was passing deep to the flexor retinaculum (Fig 1). In the sole of the foot, it occupied a position deep to the tendon of FDL, where it communicated with the tendon of flexor hallucis longus. Finally the accessory muscle inserted into the FDA near the attachment of the latter into the tendon of flexor digitorum longus (Fig 2). The muscle was supplied by a direct branch of tibial nerve above the flexor retinaculum.

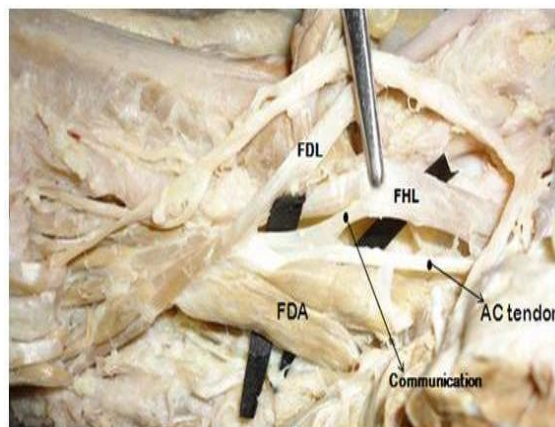


Fig 2: Dissection of the sole of the foot: Closure view of the position of accessory muscle tendon (AC tendon) and its communication with flexor hallucis longus (FHL) and flexor digitorum accessories (FDA). FDL: flexor digitorum longus.

constituent part of the deeper layer of the flexor pronator group of muscles that has come to occupy a position confined to the sole of the foot. According to the author, FDA is almost a dual muscle as it consisting tibial and fibular sided heads. However, the

fibular head is present in monkeys and apes, whereas, the tibial head is can be seen only in humans and, oddly, in some of the most primitive mammals. Thus, in humans, the FDA is an essential human specialisation, since its extensive attachment to the tibial side of the calcaneum which is absent in monkeys and apes. Origin of this muscle, in many primitive mammals is from the pronator pedis element, representing part of the deep stratum of the flexor-pronator mass that is present at the junction of the two distal segments of the hind limb. Survival of this deep stratum is recognised in occasional human muscles that, arising somewhat variably in the leg, become blended with the FDA in the foot.

Wood J (1868) ⁽⁷⁾ in his study on aberrant muscles of lower limb, reported variant muscles in 4 male subjects out of 68, and in 1 female out of 34. In all cases, it arose from the lower third of the fibula and the fascia covering the flexor hallucis longus. In 3 of the males it was found in both legs. In remaining one male and in the female it was found in the right leg only. The variant muscle encountered in the female cadaver was a unipennate muscle originating from the lower third of the outer border of the fibula and ending as a tendon which joined that of the FDL. Hence he named it as flexor digitorum accessories longus pedis.

An extensive study by Peterson et al. (1995) ⁽⁸⁾ reported the existence of an accessory flexor digitorum longus muscle in 11 out of 136 lower limbs.

Presence of variant muscles in the posterior compartment of the leg may forms a land mark along the line of passage of FDA into the sole of the foot by way of the tibial aspect of the knee joint (Jaijesh et al., 2005). ⁽⁹⁾ Gumusalan et al., (2000) ⁽¹⁰⁾ suggests that, this type of morphology with the tibial sided higher origin would be phylogenetically older and that, in persisting

it humans have preserved with more primitive muscular plan.

CONCLUSION

It has to be borne in mind both by the surgeons, orthopedicians as well the radiologists while operating and interpreting the swelling in the medial side of leg or pain due to the entrapment of the tendon as in flexor hallucis syndrome. Accessory muscle tendon can also be useful during tendon transfer of the muscle in the posterior compartment.

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