Introduction

Several research studies have highlighted the anomalies involving the APL muscle. There are reports on the anomalous division of APL into varying number of slips. One such report even defined the APL to divide into seven different slips. It has been defined that “It may be exceptional to find a single tendon of insertion of this muscle” (4). Past reports have outlined the fact that much has been known about the tendons of APL but there are few reports on the muscle bellies of APL (16).

In the present study, the APL muscle after originating from the posterior surface of the radius and ulna, continued as a tendon under the extensor retinaculum, thereafter became a muscle belly in relation to the dorsolateral part of the 1st metacarpal bone, to end as a tendon with its attachment to the base of the proximal phalanx. Such an unusual variation of APL with its attachment into proximal phalanx is a rare finding and may be of importance in altering the mechanics of the thumb during abduction. The clinical significance of such an anatomical variation of APL may be important during reconstructive surgeries involving thumb and also of academic interest.

Case report

During routine cadaveric dissection in the department of anatomy, we detected anomalous APL muscle on both sides. The APL tendon is harvested (6). We as anatomists believe that reporting such important variations of APL may be important for clinicians and surgeons in day to day practice.

Key words: Variation; Anomaly; Muscle; Abductor pollicis longus; Tendon; Attachment
sides of a 34 year male cadaver with history of cardiac arrest. The extensor and the lateral compartment of the hand were dissected and the APL muscle was displayed. The variations of the APL were noted on both upper limbs. The muscle was studied in detail and appropriate photograph was taken (Fig. 1).

**Observations** (Fig. 1)

The APL muscle originated from the posterior surface of the radius and ulna. Soon after its origin the muscle descended laterally. The tendon of APL muscle continued beneath the extensor retinaculum, to continue as a muscle belly in relation to dorsolateral aspect of the 1\textsuperscript{st} metacarpal bone before its final insertion again as a tendon into the base of proximal phalanx. The tendon of extensor pollicis brevis accompanied the APL tendon. The extensor pollicis brevis had its normal attachment accompanying the APL in the same compartment. This anomaly was noted on both sides of the cadaver. No other associated anomalies were observed.

**Discussion**

Split insertion of APL is commonly found in chimpanzees, gorillas and gibbons (15). This fact had prompted many of the past researchers to focus their study on the APL muscle. The APL is widely considered to be the most variable muscle in the forearm (5). The anomalies of the APL assumes much importance for any academic, surgical and clinical purpose considering the fact that there are less reports of such variations in standard anatomy and surgery textbooks.

Duplication of the APL muscle have been reported (1, 4, 13, 14). A varying number of tendon slips ranging from three to seven have been reported. (2, 3, 9, 10, 11). From the above facts it is clear that APL exhibits more than one tendon, hence the clinical importance of the anomalous divisions of APL cannot be neglected. Although there are various reports on the variations in the number of slips of the APL tendon, to the best of our knowledge, there are hardly any studies which report the tendon of APL becoming a muscle belly and again a tendon to be inserted to the proximal phalanx instead of its normal attachment to the metacarpal. A conventional textbook has reported the fact that the muscle belly might be split into different muscular components but no further details regarding its frequency or its distal attachment into proximal phalanx have been described (13).

Presence of anomalies of APL muscle are usually detected when the patient presents with clinical symptoms. The anomalies of the APL are important to understand the etiology and subsequent surgical decompression of De Quervain’s Syndrome (7, 8, 14). During surgeries the unawareness of the multiple tendons in separate compartments may result in improper recognition of the tendons (9). There are more chances of injury during surgeries, if there is the lateral position of the supernumerary tendon (12). Supernumerary tendons contribute to the development of De Quervain’s stenosing tendovaginitis.

All the past research studies have mentioned the fact of multiple tendons of APL muscle but none of the reports have defined a muscular belly which was found in relation to the metacarpal and the tendinous continuation to insert into the proximal phalanx. Our study reports a normal origin of APL but its tendon instead of inserting into the metacarpal bone became a muscle belly in relation to the dorsolateral part of the 1\textsuperscript{st} metacarpal bone (‘D’ in Fig. 1) and again became a tendon before its distal attachment to the base of proximal phalanx. We as anatomists speculate that the existence of such an anomaly may alter the power of grip, as the thumb forms one half of the functional unit while holding or gripping an object.

The thumb is useless without the tendon of APL muscle as the metacarpo-phalangeal joint will overextend during any attempt of pincer grasp between thumb and index finger (9). The mechanics of the abduction of the thumb may be altered in such a case. In absence of any classical description of the variations of the APL muscle belly in conventional anatomy textbooks, the present case study is a humble effort to highlight anomalous muscle bellies of APL before its distal attachment to the phalanx. The knowledge of such a variation may be important in understanding the proper functioning of the thumb movements and helpful during any interposition arthroplasty where the APL tendon is used.

**References**

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