



ORIGINAL RESEARCH PAPER

Anatomy

An Anomalous Relationship of the Common Digital Nerve and the Artery of the Third Web: A Case Report

KEY WORDS: Clinical Hypothyroidism, Subclinical Hypothyroidism, TFT and Lipid Profiles.

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Introduction

Radial and ulnar arteries are the main sources of the hand arterial supply forming superficial and deep palmar arches from which common digital arteries are branched. These arteries also form the dorsal carpal arch. Superficial palmar arch is formed by direct continuation of the ulnar artery receiving the superficial branch of the radial artery, while the deep palmar arch is formed by the radial artery to which a deep branch of the ulnar artery merges medially. Median, ulnar, and radial nerves supply the fingers via volar common digital and dorsal digital nerves. At the palm, superficial palmar arch and its common digital arteries are volar to the corresponding nerves. These arteries then move to the side and lie dorsal to the nerves just proximal to their terminal branches called proper digital nerves (**Figure 1 a, b, c, and d**).

Case report:

We dissected an arm amputated from a 20-year-old male due to a bone carcinoma. We found fortuitously that the common digital artery supplying the third and fourth fingers has pierced the proper digital nerves of the same digits originating from the sensory branch of the median nerve. This artery was a direct continuation of the ulnar artery, which seemed to supply the second and third web spaces. Moreover, there were branches connecting the proper digital nerves to each other.

Discussion

Knowledge of normal anatomy of the hand neurovascular structures and its variations is essential for a safe hand surgery. In many cases, unknown anomalies might be the cause of some indescribable signs and symptoms. Anatomical variations of the median and ulnar nerves are a known concept. Median nerve was reported to enclose the median artery (1). In some specimens, it was observed that the superficial branch of the ulnar artery formed the palmar arch receiving no contribution from the radial artery (2).

Meales and Shaner found no anatomical variation in the common digital nerves of 50 hands (3). Sachs GM et al reported no anastomoses in the forearm. However according to electrophysiological study, authors showed that the palmar communication between the median and ulnar nerves (Riche-Cannieu) was primarily by motor axons (4).

In our case, the common digital artery to the third and fourth digits has pierced the proper digital nerves of the same fingers lying dorsal to the nerves. In fact, the proper digital nerves bifurcated to accommodate the artery to pass through just before reaching to the base of the fingers. The aforementioned divided proper digital nerves had given branch to each other as well (**Figure 2 a, b, c**). To the best of our knowledge, there is no prior report of such anomaly. In a cadaveric study Dong Tian and Maoyong reported that the common digital artery pierced the common digital nerve but it was not bifurcating (5). Furthermore, in our case the ramified digital nerves, i.e., the proper digital nerve, were interconnecting by giving branches to each other. We also noted that the proper digital artery has given a branch to supply the flexor tendons and their sheaths, which traversed through the proper digital nerve. Future cadaveric study is needed to account for the prevalence of

this anomaly, and clinical and paraclinical studies is also required to find out its significance.

Figure legends:

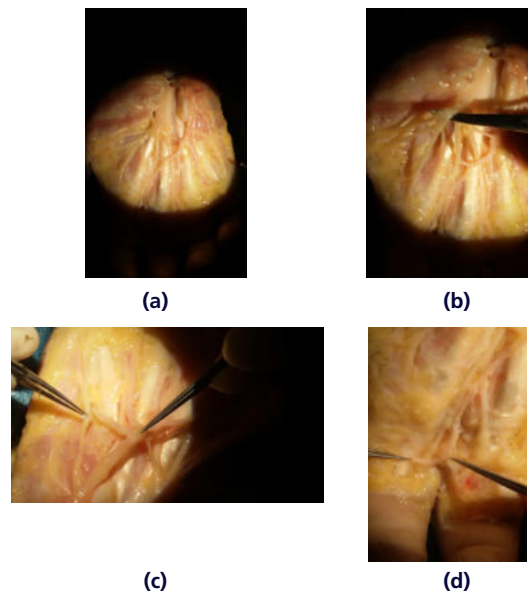


Figure 1 (a, b, c and d): Normal anatomy of hand arteries and nerves: (a), (b) top two figures--Normal anatomical relationship of median and ulnar nerves and their branches with overlying superficial palmar arch as a continuation of ulnar artery; (c)-bottom left--Common digital artery passing at the side of its corresponding nerve lying dorsal to it proximal to nerve ramification; (d) -bottom right-- Branch of the proper digital artery traversing proper digital nerve at the base of finger

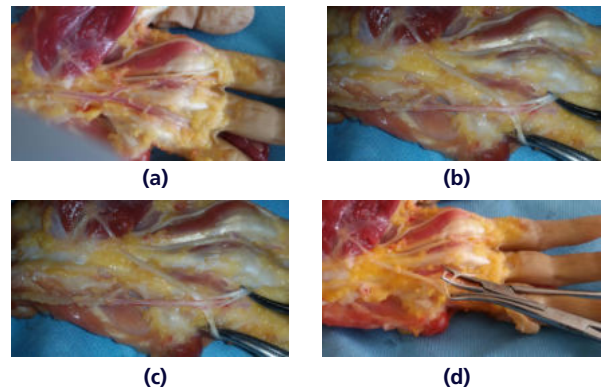


Figure 2(a, b, c and d): (a)-top left--Common digital artery of the 2nd and 3rd web, originating from superficial palmar arch as a continuation of ulnar artery lying volar to common digital nerves

which are branches of median nerve; (b),(c)-top right and bottom left-Common digital artery has pierced two proper digital nerves which are ramifications of common digital nerve; (d)-bottom right-Common digital artery removed, note that the common digital nerve has ramified into two proper digital nerves, and each proper digital nerve has been also branched and then remerged to allow the passage of common digital artery. Note that the proper digital nerves have also given branches to each other.

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