

Case Report

A Rare Anatomical Variation in Branching Pattern of Ulnar Nerve

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Abstract

Background & Objective: Recognition of peripheral nerve variations plays a crucial role in therapist or surgeon evaluations. In human arm, ulnar nerve is one of the three principal nerves that move from the neck down to the hand and provide sense and function of the hand.

Case: Present article reports a scarce finding, the unusual branch of the ulnar nerve along with the main trunk originated under the flexor carpi ulnaris near the cubital region. After descending along the medial side of the forearm flexor surface about 5 cm proximal to the wrist has been divided into 2 cutaneous branches.

Conclusion: Awareness and ability in recognition of position and variations significantly influence the result of ulnar nerve improvement. Sufficient knowledge of all possible variations may be helpful for surgical improvement and effective nerve blockage.

Keywords: Ulnar nerve, Anatomic variation, cutaneous innervation

Introduction

Ulnar nerve is mainly represented as the nerve of the hand. It is one of the most clinically relevant nerves, due to its superficial course and clinically significant role in hand function (1). According to anatomical text, ulnar nerve is an extension of medial cord (C8-T1) of brachial plexus in the axilla. It descends at the medial aspect of the arm down into the insertion of coracobrachialis. Here it pierces the medial intermuscular septum and courses through the ulnar groove between the medial epicondyle and olecranon process to enter the forearm by running between two heads of flexor carpi ulnaris (cubital tunnel). It then travels on the medial side of the forearm, giving off several branches innervating Flexor carpi ulnaris and Flexor digitorum profundus muscles. Finally, it enters the hand to give it motor and sensory fibers that allow functioning of the hand (2). A

number of studies have reported anomalous patterns in trunks and cords of brachial plexus and formation of ulnar nerve (3-5). Paraskevas et al recommended that ulnar nerve variations mostly have been situated in the original or distal branches course (6). In the present case, ulnar nerve has been divided into 2 branches near the cubital region which has not been submitted in other literatures. Recently, there is a revival of interest in the use of regional anesthesia around the world. Regional anesthesia is a type of pain management which has been used through surgery (7). Thus, anatomical variations reported in this article can be used in regional anesthetic agent management during surgery in the upper limb and in interpretation of pain and sensory loss during injuries or surgical approaches.

Case Report

During cadaveric dissection of 50-year-old Iranian male cadaver in Abadan School of Medical Sciences, a unique variation was observed on the right forearm. The forearm and

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palm were completely dissected and the fascia was carefully removed. After that flexor carpi ulnaris reflected medially and flexor retinaculum has been removed. The course of ulnar nerve and their branches were completely traced and the anatomical variations were reported. The branch of the ulnar nerve (common branch) along with the main nerve originated under the flexor carpi ulnaris near the cubital region, after descending along the medial border of the forearm flexor surface and about 5 cm proximal to the wrist had been divided into palmar and dorsal cutaneous branches that supply the skin of 1/3 medial of hand. The main trunk entered the ulnar (Guyon's) canal on the anteromedial side of the wrist and divided into superficial (sensory) and deep (muscular) branches. The superficial division anastomosis with a communicating branch from the palmar cutaneous branch continued as the proper digital nerve. Further branches of ulnar nerve had normal anatomical courses. The vessels and other nerves of forearm region had no anatomical variation either (Fig 1).

The anatomical nerve variations may be due to axonal growth, path-finding and different models of branching during human body development (9, 10). Different processes such as various molecular signals and chief directions might have caused these differences (11).

The ulnar nerve typically is one of the 5 terminal branches of brachial plexus. Many researches have reported a prevalence of anatomic variations in ulnar nerve formation and its branches. Here, the medial proper digital nerve to the little finger forms the dorsal branch of the ulnar nerve that originated higher (12). It has been shown that a nerve branch comes up from the dorsal cutaneous branch and merges with superficial ramus of ulnar nerve (Kaplan's anastomosis) (6).

Classifying the variations in the branching pattern of ulnar nerve will help the presentation and differential patient's clinical diagnosis (13). Recognizing the existence of abnormal connections between terminal branches of the ulnar nerve is crucial, as it can be damaged

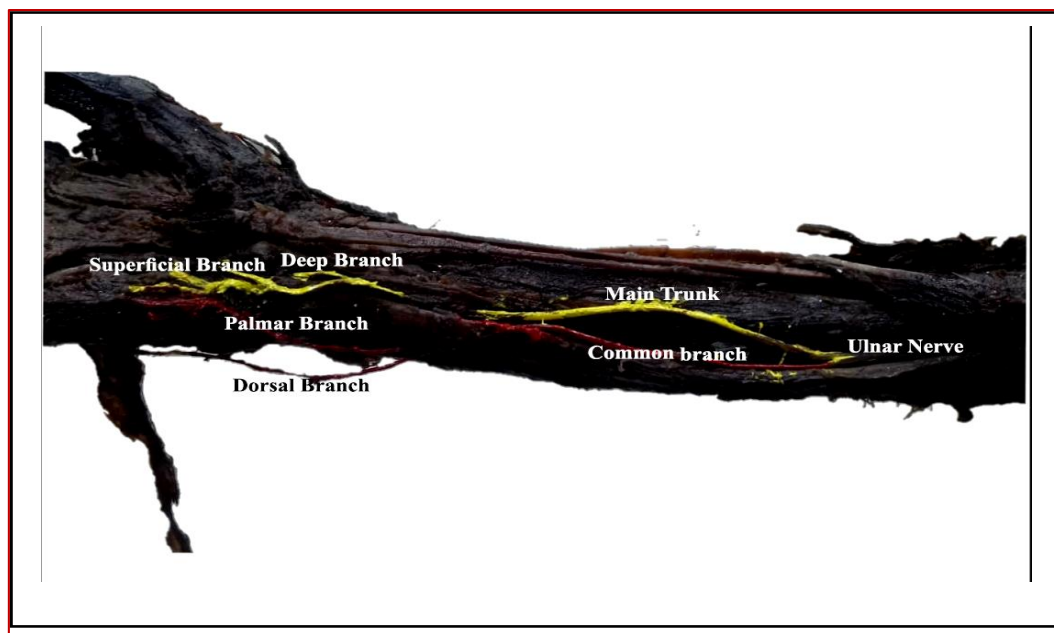


Figure 1. Right upper limb showing ulnar nerve and the branching pattern in forearm.

Discussion & Conclusion

Recent advances in surgical techniques and new clinical diagnoses make it necessary to gain more knowledge on the nerve variations and atypical patterns of sensory loss or pain observed following surgery or trauma (8).

during surgery (14). In addition, it has also been demonstrated that the congenital atypical course of the ulnar nerve branches in the forearm may cause ulnar compressive neuropathy and may be improved with surgical intervention (15).

Finally, the knowledge of existing variations in the peripheral nerves is crucial in diagnostic approach, image technology and MRI

interpretation and can be important for nerve block, carpal tunnel release, repairing of the ulnar bone and other surgical and anesthetic managements during hand surgery to interpret discrepancies in sensory loss after injuries (16, 17). Conclusively, knowledge on possible variations can help surgeons to follow up patients with ulnar nerve entrapment and assure that appropriate planning and execution of decompression surgery resolves the patient's signs.

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Conflict of Interests

All authors certify that this manuscript has neither been published in whole or in part nor is it being considered for publication elsewhere. The authors have no conflict of interest to declare.

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گزارش مورد

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چکیده

زمینه و هدف: شناسایی تغییرات اعصاب محیطی نقش مهمی در ارزیابی درمانگر و جراح دارد. در بازوی انسان، عصب اولنا یکی از سه عصب اصلی است که از گردن به سمت دست حرکت میکند. این عصب مسوول ایجاد حس و عملکرد دست است.

مورد: مقاله حاضر یک یافته کمیاب در مورد یک شاخه از عصب اولنا است که همراه تنه اصلی عصب در زیر عضله فلکسور کارپی اولناریس نزدیک ناحیه کوبیتال جدا میشود. پس از پایین آمدن در سمت داخل سطح فلکسور ساعد حدود ۵ سانتی متر بالاتر از مچ دست به دو شاخه پوستی تقسیم میشود.

نتیجه گیری: آگاهی داشتن و توانایی در شناخت موقعیت و تغییرات آناتومیک تاثیر مهمی در نتایج حاصل از بهبود عصب اولنا دارد. دانش کافی در مورد تمام تغییرات ممکن است در بهبود جراحی و انسداد موثر عصبی مفید باشد.

کلمات کلیدی: عصب اولنار، تغییرات آناتومیک، عصب گیری حسی

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