

CASE REPORT

TERMINATION OF THE CEPHALIC VEIN IN THE CUBITAL FOSSA

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ABSTRACT

Venous blood from the upper extremities is drained through two sets of veins the deep and superficial. The main superficial veins of the upper limb, the cephalic and basilic, originate in the subcutaneous tissue on the dorsum of the hand. Reported here is a case of unilateral variation of the cephalic vein observed during dissection class for first-year medical students. Knowledge and awareness of variations of vessels may greatly contribute to the success of surgical, invasive and radiological procedures.

Keywords: Cephalic vein, Upper limb, Superficial veins, Variations.

INTRODUCTION

Venous blood from the extremities is drained through the deep and the superficial veins. The superficial veins are used for bloodletting for various diseases and in numerous medical procedures (1). The main superficial veins of the upper limb, the cephalic and basilic veins, originate in the subcutaneous tissue on the dorsum of the hand from the dorsal venous network (2).

Cephalic vein originates from the lateral end of the dorsal venous network of the hand. It then ascends towards the cubital fossa, where it receives one of the branches corresponding to the median antebrachial vein. In the arm, it is located side with the biceps brachii muscle, arriving at the shoulder occupying the deltopectoral groove (3, 4).

The basilic vein ascends in the subcutaneous tissue from the medial end of the dorsal venous network along the medial side of the forearm and the inferior part of the arm. It then passes deeply near the junction of the middle and inferior thirds of the arm, piercing the brachial fascia and running superiorly parallel to the brachial artery and the medial cutaneous nerve of the forearm to the axilla, where it merges with the accompanying veins of the axillary artery to form the axillary vein (2). The two veins communicate with each other in the cubital region by median cubital vein (1, 2) (Figure 1).

The cephalic vein is suitable for central venous access, pacemaker, and defibrillator implantation, and reported to have a lower incidence of complications than a subclavian puncture (4, 5). Hence, the anatomical knowledge of the cephalic vein is of critical importance when considering emergency procedures (5).

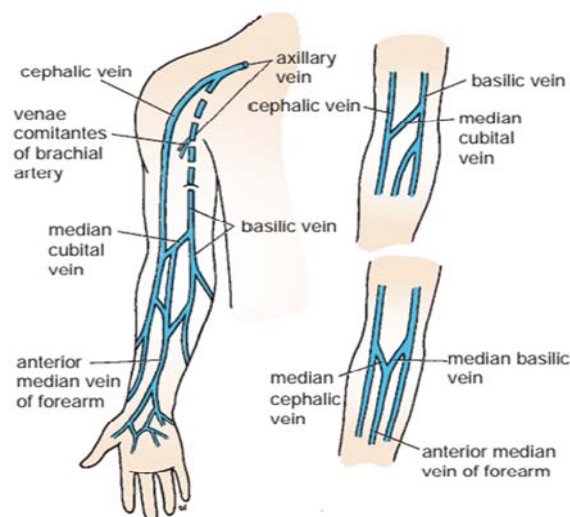


Figure 1: The superficial venous pattern of the upper limbs (2)

Different authors have reported the anatomical variations of the cephalic vein as absent, very thin, accessory, different course, and various terminations (5). For example, in a study of 300 arms, a case of bilateral absence of the cephalic vein has been reported. The accessory cephalic was reported in 82% of cases. In 39% of cases, this vessel originated from the distal part of the dorsal forearm, in 28% from the ulnar end of the dorsal venous arch, and in 16% from the cephalic at a point where the cephalic turns around the radial border of the forearm. In 17% of cases, it was either not present or extremely small. The termination of the cephalic was almost constant, but two variations were reported. In one case, the cephalic crossed the distal third of the arm to join the basilic.

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In the other case, the cephalic became continuous with the median cubital and thus terminated in the basilic vein (6). Overall, knowledge and awareness of the various anatomical variations have clinical significance to students, researchers, surgeons, radiologists, etc. Therefore, the main purpose of this case report was to demonstrate the anatomical variation of the superficial vein of the upper limb.

CASE DESCRIPTION

During a gross anatomy dissection session held at the Department of Human Anatomy, Bahir Dar University, an anatomical variation was noticed in a male cadaver. It was observed that the right cephalic vein terminated in the cubital fossa in the right upper extremity of a 43-year-old male cadaver (Figure 2). Pictures of the cadaver were taken and are described below.

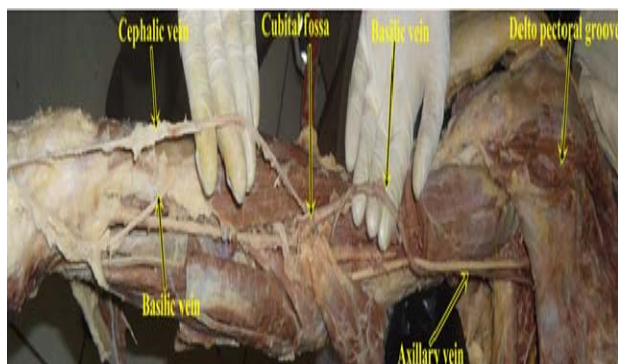


Figure 2: A cadaveric photograph showing the termination of the right cephalic vein on the cubital fossa

The dissection was performed, according to Cunningham's Manual of Practical Anatomy, Volume I (7). The anatomy of the superficial veins on the left side was normal (as usual). However, after the reflection of the skin of the right upper limb, we found the following anatomical variation:

The right cephalic vein, which originates from the radial side of the dorsal venous network, ascends towards the cubital fossa where it terminates communicating to the basilic vein via a medial cubital vein, and the basilic vein receiving the blood from the ulnar side pierces the brachial fascia and becomes brachial vein (Figure 2). We carefully followed the course of the right cephalic vein after it reaches in the cubital fossa and in the space between biceps brachii and brachioradialis muscle in the arm; up in the deltopectoral groove and no superficial vein was observed (Figure 2).

DISCUSSION

The superficial veins of the upper limb begin as an irregular dorsal arch on the back of the hand. The cephalic vein begins at the radial side and the basilic vein at the ulnar side of the arch.

Both veins ascend along with the lateral and medial aspects of the extremity within the superficial fascia. The cephalic vein pierces deep fascia to enter the axillary vein just distal to the clavicle whereas the basilic vein pierces in the arm and joins the venae comitantes of the brachial artery to form the axillary vein (8).

In embryonic life, the veins arise from capillary plexus, which is increased by sprouting and anastomosing and then fuse, enlarge forming fewer and large channels. Genetic and hydrodynamic factors play an important role in the final pattern of veins, which may result in variations (1). Although descriptions of the cephalic vein are typically brief and lack the details in anatomy textbooks, it is important clinically (4).

Authors have reported the variations in the course and the termination of the cephalic vein. The cephalic vein may terminate at the internal jugular vein, the external jugular vein, or the basilic vein. Lau *et al.* reported the cephalic vein emptied into the subclavian vein via a supraclavicular course (5).

In the current case, we found that unusual termination of the right cephalic vein in the cubital fossa was observed in the right upper extremity of a 43-year-old male cadaver, no superficial vein was observed in the deltopectoral groove (Figure 2). The anatomy of the vein on the left side was as usual.

A study done in India on 50 upper limbs showed that in 4% of the cases the cephalic vein drains to the basilic vein at the cubital fossa (1). Another study done in America on 200 upper limbs showed that in 5% of the cases the cephalic vein was absent (4). On the other hand, a report done in Korea, the cephalic vein drained into the junction of the subclavian and internal jugular vein with an aberrant infra-clavicular course (5).

Conclusion

Knowledge and awareness of variations of vessels in the extremities may greatly contribute to the success of surgical, invasive and radiological procedures. Variations in the origin course and termination of the superficial vessels of the upper limb should not be overlooked.

Contributors

We do not have any contributors to this study.

Conflict of interest

We declared that we do not have any competing interests.

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