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## Case Report

### UNILATERAL ABSENCE OF CEPHALIC VEIN- A CASE REPORT

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#### ABSTRACT

Variations in the venous vasculature are commonly visualised during the routine dissection of cadavers. In this case the cephalic vein was absent in the deltopectoral groove of the right arm. The origin of the basilic vein was found to be varying since it originated from the lateral aspect of dorsal venous arch. A long antebrachial vein which bifurcated into two brachial veins were found draining into the axillary vein.

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#### INTRODUCTION

Veins are conveniently grouped as superficial and deep but these are widely interconnected. The superficial veins are subcutaneous in the superficial fascia; deep veins accompany arteries between the muscles of the limb. Both groups have valves which are more numerous in deep veins.[1]

The venous drainage of the upper limb is composed of superficial and deep groups of vessels.

The superficial group starts as an irregular dorsal arch on the back of the hand. The pattern of these veins is variable. The cephalic vein begins at the radial extremity of the arch. It ascends along the lateral aspect of the arm within the superficial fascia and then pierces the deep fascia to enter the axillary vein just distal to the clavicle. [1]

**Superficial Veins of the Upper Limb:** Superficial veins include the cephalic, basilic, median cubital and additional antebrachial veins and their tributaries. Dorsal digital veins pass along the sides of the fingers joined by oblique branches; they unite from adjacent sides of digits into three dorsal metacarpal veins which form a dorsal venous network over the metacarpus; this is joined laterally by a dorsal digital vein from the radial side of the index finger and both dorsal digital veins of the thumb and is prolonged proximally as the cephalic vein. [2]

#### Cephalic vein

The cephalic vein usually forms over the 'anatomical snuff-box' from the radial end of the dorsal venous plexus. It curves proximally around the radial side of the forearm to gain its ventral aspect, and receives veins from both aspects of the forearm. Distal to the elbow a branch, the median cubital vein, diverges proximomedially to reach the basilic vein. The median cubital vein is joined by a branch from the deep veins. [2]

The cephalic vein ascends in front of the elbow superficial to a groove between the brachioradialis and biceps, crosses superficial to the lateral cutaneous nerve of the forearm, ascends lateral to biceps and between pectoralis major and deltoid, where it adjoins the deltoid branch of the thoracoacromial artery. Entering the infraclavicular fossa to pass behind the clavicular head of pectoralis major, it pierces the clavipectoral fascia, crosses the axillary artery and joins the axillary vein just below clavicular level. It may connect with the external jugular by a branch anterior to the clavicle. Sometimes the median cubital vein is large, transferring most blood from the cephalic to the basilic vein; the proximal cephalic vein is then absent or much diminished.[3]

#### Accessory cephalic vein

The accessory cephalic vein may arise either in a dorsal forearm plexus or from the ulnar side of the dorsal venous network in the hand. It joins the cephalic vein distal to the

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elbow. A large oblique vein often connects the basilic and cephalic veins dorsally in the forearm. [2]

### Basilic vein

The basilic vein starts medially in the dorsal venous network of the hand. It ascends posteromedially in the forearm, inclining forwards to the anterior surface distal to the elbow, where it is joined by the median cubital vein. It then ascends superficial to and between biceps and pronator teres, and is crossed by filaments of the medial cutaneous nerve of the forearm which pass both superficial and deep to the vein. [2]

### Median vein

The median vein of the forearm drains the superficial palmar venous plexus and ascends through the anterior part of the forearm to join either the basilic or median cubital vein. It may divide distal to the elbow to join both veins. [2]

**Deep Veins of the Upper Limb:** Deep veins (venae comitantes) accompany arteries, usually in pairs flanking the artery and connected by short transverse links. Since much blood from the upper limb is returned by the superficial veins, the deep ones are relatively small. [4]

**Brachial veins:** They flank the brachial artery, with tributaries similar to the arterial branches; near the lower margin of the subscapularis they join the axillary vein, the medial one, however, often joining the basilic before it becomes the axillary. These deep veins have numerous anastomoses with each other and with the superficial veins. [4]

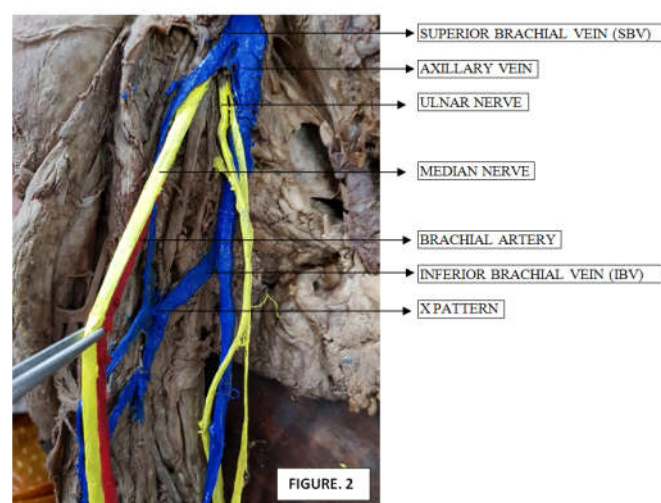
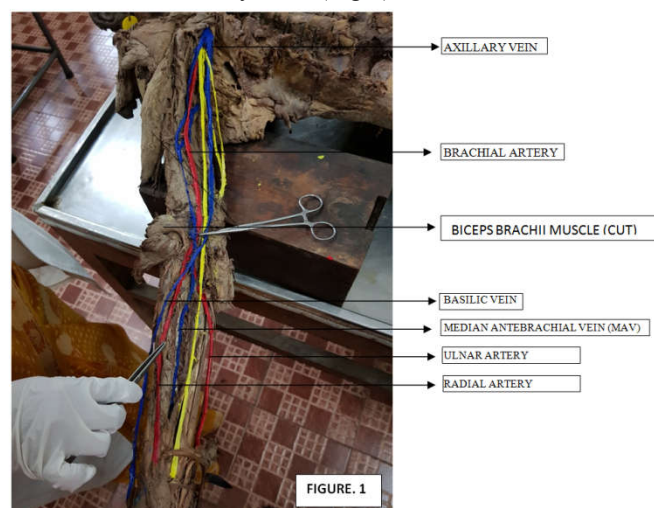
**Axillary vein:** This large vein is the continuation of the basilic, it begins at the lower border of teres major, and ascends to the outer border of the first rib, where it becomes the subclavian. [4]

**Case Report:** During a routine dissection of a 70 year old formalin fixed cadaver, It was noted that the cephalic vein was absent in the deltopectoral groove of the right upper arm whereas it was conspicuous in the left arm. The origin and course of the basilic vein was also found varying.

The Median Ante Brachial vein (MAV) was seen emerging from the posterior surface of the Pronator Quadratus muscle. Later it ascended deep to the superficial muscles of Flexor Compartment of forearm. MAV entered the cubital fossa and crossed the brachial artery from medial to lateral side. Later MAV went to the postero medial aspect of the biceps brachii muscle and bifurcated into two tributaries. The inferior one ie Inferior Brachial Vein (IBV) moved abruptly medially posterior to the brachial artery and terminated in the basilic vein. IBV communicated with the superior one ie Superior Brachial Vein (SBV) through a small tributary and this anastomosis was in the shape of alphabet X. Superior Brachial Vein (SBV) after moving 5cm upwards crossed the axillary artery & medial cord of brachial plexus from lateral to medial side and terminated in the Axillary vein. (Fig.2)

Basilic vein originated from the dorsal venous arch anterior to the anatomical snuff box. In the lower part of the forearm it superficially crossed the radial artery from lateral to medial side. After traversing a short distance it superficially crossed the median nerve from lateral to medial side within the cubital

fossa. Then it ran superficial to the pronator teres muscle and continued as the axillary vein. (Fig.1)



## DISCUSSION

Variations in the vasculature of the upper limb is frequently noticed during routine cadaveric dissection. According to Loukas.M *et al* (2008) in a study of 100 cadavers reported that the cephalic vein was found in 95% (190 right and left) specimens, while in the remaining 5% (10) the cephalic vein was absent. In 80% (152) of cases the cephalic vein was found emerging superficially in the lateral portion of the deltopectoral triangle. In 30% (52) of these 152 cases the cephalic vein received one tributary within the deltopectoral triangle, while in 70% (100) of the specimens it received two. In the remaining 20% (38) of cases the cephalic vein was located deep to the deltopectoral fascia and fat and did not emerge through the deltopectoral triangle but was identified medially to the coracobrachialis and inferior to the medial border of the deltoid. In addition, in 4 (0.2%) of the specimens the cephalic vein, after crossing the deltopectoral triangle, ascended anterior and superior to the clavicle to drain into the subclavian vein. [5]

Bhattacharya Santanu *et al* (2012) has reported a case of numeral neurovascular variations in a single cadaver and stated that in the both upper limbs axillary veins were formed at a higher level than usual with a single venous channel on the left side. On the left side, cephalic and basilic veins were absent

above and below the elbow, respectively. So, a single vein was found in left upper limb along the lateral side of forearm, which subsequently passed from lateral to medial side across the cubital fossa and continued upwards to drain into the axillary vein. On both sides axillary vein was formed by basilic vein and venae comitantes along with brachial artery at a higher level (behind the pectoralis minor muscle). [6]

Vrinda Hari Ankolekar *et al* (2014) in a study of 10 formalin fixed cadavers has reported that the cephalic vein traversed the deltopectoral groove and terminated into the axillary vein. Moreover the location of cephalic vein in relation to various anatomical landmarks was also studied [7]

Baptista Silva *et al* (2003) in his study has reported that basilic vein was single and present in Twenty-six arms from 13 cadavers were studied. A comparative analysis, which included the number of valves and measurement of the diameter of the basilic vein at three different points in the arm, was done. The basilic vein was always present and single. In its superficial segment, this vein was joined by the intermediate cubital vein in 69.8% (19/26) of the cases, by the intermediate basilic vein in 23.1% (6/26) and by the intermediate vein of the forearm in 3.8% (1/26). The basilic vein perforated the brachial fascia in the lower or mid third of the arm. The deep segment of the vein ran alone up to the inferior border of the m. teres major in 23.1% (6/26) of the cases, and joined the medial brachial vein in 53.8% (14/26), on the brachial vein in 23.1% (6/26) before forming the axillary vein. The valves were predominantly bicuspid (89.3%) and were equally distributed between superficial (48.5%) and deep (51.5%) segments of the basilic vein. These findings indicate that the basilic vein of the arm is anatomically compatible for use in arteriovenous fistulas for hemodialysis [8]

## CONCLUSION

The anatomical knowledge of cephalic & basilic veins is very important from the surgical point of view since they are widely preferred for catheterization procedure.

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