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Case Report

BILATERAL HIGHER DIVISION OF BRACHIAL ARTERY: ITS MORPHOLOGY, EMBRYOGENESIS AND CLINICAL IMPLICATIONS

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ABSTRACT

Brachial artery is the continuation of axillary artery and it begins at the lower border of teres major and terminate into radial and ulnar artery at the level of neck of radius in the cubital fossa. Exact information regarding these variations is important during vascular and re-constructive surgery and also in evaluation of angiographic images. In the present study we noted an adult male cadaver with bilateral higher division of brachial artery. In this reportwe endeavour to discuss the relevance of embryogenesis and clinical importance. The knowledge of these variations is important to interventional surgeons, radiologists and anatomists. Exact information regarding these variations is important during vascular and re-constructive surgery and also in evaluation of angiographic images.

KEY WORDS: Brachial artery, Radial artery, Ulnar artery, Higher division, Vasuclar, Variations.

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INTRODUCTION

Brachial artery is the artery of brachium or arm.It begins as a continuation of axillary atery at the lower border of teres major and terminate as radial and ulnar artery about a few centimeter distal to the elbow joint. Artery is crossed superficially by the median nerve from lateral to medial [1]. Variations in the pattern of upper limb arteries have been reported since the 17th century [2]. Quain's in 1844 published the first systematic description and classification of these variations on the basis of cadaver dissection and angiographic studies [3]**.** Various authors have mentioned about the incidence of high origin of radial artery. The knowledge of these variations is important to interventional surgeons, radiologists and anatomists [4]. In reconstructive microvascular surgeries and plastic surgeries radial artery plays a major role to replace oral mucosa in intra oral reconstruction radial forearm flap is ideally used [5]. The present case demonstrates bilateral variation in the course and division of brachial artery in the same cadaver.

Case Report

Out of 4 human upper limbs dissected by 1st year M.B.B.S. students in the Department of Anatomy kannur Medical College & Hospital, kerala.

We observed an unusual case of bilaterally symmetrical higher bifurcation of brachial artery into radial and ulnar arteries with superficial course of radial artery in forearm.

OBSERVATIONS

In upper limb of a male cadaver, bifurcation of brachial artery into radial and ulnar arteries few centimeters from the lower border of teres major was found bilaterally. Both the arteries had superficial course in the arm along the medial aspect of biceps brachii. In the lower part of arm median nerve was seen crossing ulnar artery from lateral to medial side, where as radial artery lying superficial to medial nerve. In the cubital fossa ulnar artery seen deep to the pronator teres separating it from median nerve. Further course of radial and ulnar artery was normal (Fig 1,2).

Fig 1: Showing higher origin of the radial artery from brachial artery and its course in arm and forearm on the right side.

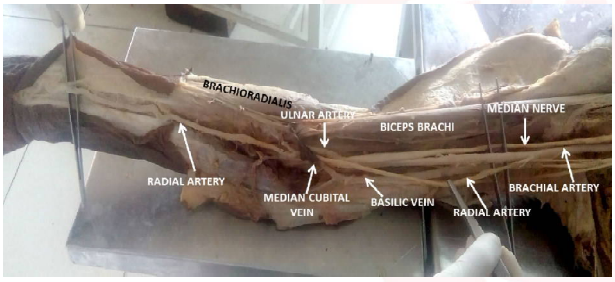
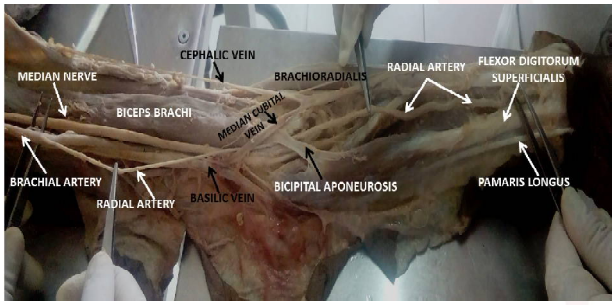


Fig. 2: showing higher origin of the radial artery from brachial artery and its course in arm and forearm on the left side.



DISCUSSION

Brachial artery is the continuation of axillary artery and it begins at the lower border of teres major and terminates into radial and ulnar artery at the level of neck of radius in the cubital fossa. Anatomical variations of this artery occur in almost 20% of the cases [6].

Several authors have described in detail arterial variations of the upper limb. The variations in the form of high proximal division into terminal branches occur in the radial artery (15%), ulnar artery (2%) and common interosseous artery [7].

According to Anson 15% of individuals have high origin of radial artery & may arise as high as the axillary artery but most commonly it arises from the proximal one third of the arm [8]. McCormack et al., in his study on 750 cadavers noted arterial variation in 18.5% of cases, out of which 77% of the cases with high origin of radial artery, while the ulnar artery was responsible for 12.2% of the variations [9]. Another study on cadaveric dissection observed an incidence of 14.27% of high origin of the radial artery and 9.75% in an angiographic study [10]. Chandrika teli et al. mentioned about a case in which the brachial artery divided into radial and ulnar arteries, about 1.5 cm distal to the lower border of teres major muscle, in the upper third of arm. They also noted that median nerve crossed radial artery from lateral to medial side as it travelled to cubital fossa, where as the course of the arteries was same in the forearm [11]. We in our case also had an equivalent findings, where we noted that brachial artery divided into ulnar artery and radial artery few centimetres below the teres major (upper third of arm),and the median nerve was seen crossing the ulnar artery and the rest of the course was same in the forearm. Bozer et al mentioned a incidence of variations of superficial ulnar artery ranging from 0.6% to 9.4%. He also noted that variation was more frequent unilaterally than bilateral variation [12]. The short segment brachial artery with its high termination division into radial and ulnar arteries can be explained on the basis of embryology.

The axis artery of upper limb-bud is derived from the lateral branch of seventh intersegmental artery (subclavian). Proximal part of main trunk forms an axillary artery continuing as brachial artery and its distal part persists as the anterior interosseous artery. At first, the radial artery arises more proximally than the ulnar artery from the main trunk. Later, the radial artery forms a new connection with the main trunk at or near the level of origin of the ulnar artery. The proximal part of original stem usually disappears,

thus radial and ulnar arteries arise at same level. Persistence, genesis and regression of artery other than normal one, may explain the cause of anomalous origin of artery. In the present case proximal segment of radial artery fail to fuse and new connection with main trunk was not establish, result in early origin of the radial artery [13].

CONCLUSION

The knowledge of thearterial variations are very important for the clinical, radiological and surgical diagnosis [4]. Exact information regarding these variations is important during vascular and re-constructive surgery and also in evaluation of angiographic images.

The superficial position of ulnar and radial arteries not only makes them more vulnerable to trauma but also make them more accessible to cannulation, if needed. By being superficial, ulnar artery may be mistaken for a vein. If certain drugs are injected into this vessel, they will results gangrene of hand due to reflex vascular occlusion [13].

Conflicts of Interests: None

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