



A CASE REPORT ON VARIANT ULNAR ARTERY

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<p>Article Info</p> <p><i>Received 15/01/2015</i> <i>Revised 27/01/2015</i> <i>Accepted 12/02/2015</i></p> <p>Key words: Brachial artery, Superficial antebrachial artery, Superficial brachial artery, Superficial ulnar artery, Ulnar artery.</p>	<p>ABSTRACT</p> <p>During the routine dissection of the axillary region and the arm for undergraduate student on a 75 years old donated embalmed cadaver in the department of Anatomy of K.J.Somaiya Medical College, Sion, Mumbai, India, an unusual branch of the brachial artery was found. The brachial artery terminated in the cubital fossa into radial and ulnar or interosseous arteries. The radial artery had normal course and branches. The other artery was deeper and gave the common interosseous artery, anterior and posterior ulnar recurrent arteries, and muscular branches to brachioradialis and flexor pollicis longus and ended in the median nerve in the distal part of the forearm. The unusual large branch from the brachial artery was a variant of ulnar artery, arose from the lateral side of the brachial artery, descended on the lateral side upto the cubital fossa and crossed the fossa from lateral to medial, superficial to median nerve. It then descended superficial to the muscles arising from medial epicondyle of the humerus and was covered by the deep fascia of the forearm, pierced the deep fascia proximal to the wrist, crossed the flexor retinaculum, and formed the superficial palmar arch. Throughout its course, this artery gave no branch. The embryological basis of the variation is presented.</p>
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INTRODUCTION

The brachial artery ends in the cubital fossa by dividing into radial and ulnar arteries. At the elbow, the ulnar artery sinks deeply into the cubital fossa and reaches the medial side of the forearm midway between elbow and wrist. The common interosseous artery is a short branch of the ulnar, passes back to the proximal border of the interosseous membrane and divides into anterior and posterior interosseous arteries. Anterior interosseous artery descends on the anterior aspect of the interosseous membrane with the median nerve's anterior interosseous branch. Median artery, a slender branch from anterior interosseous artery, accompanies and supplies the median nerve [1].

MATERIAL AND METHODS

During the routine dissection of the axillary region and the arm for undergraduate student on a 75 years

old donated embalmed cadaver in the department of Anatomy of K.J.Somaiya Medical College, Sion, Mumbai, India, an unusual branch of the brachial artery was found. The branches of the brachial, ulnar, and radial arteries were carefully traced. The photographs of the variations were taken for proper documentation and for ready reference. No other neuro-muscular variation was observed in the same upper limb. The left upper limb of the same cadaver was also normal.

OBSERVATIONS

The brachial artery had the named branches as usual. It terminated into radial and ulnar or interosseous arteries in the cubital fossa at the level of the neck of the radius. Radial artery had normal course and branches. The other artery was deeper and gave the common interosseous artery, anterior and posterior ulnar recurrent arteries, and



muscular branches to brachioradialis and flexor pollicis longus and ended in the distal part of the forearm in the median nerve. The unusual large branch from the brachial artery arose from its lateral side at the level of the insertion of the coracobrachialis muscle. It descended on the lateral side up to the cubital fossa and crossed the fossa from lateral to medial, superficial to the median nerve. It then descended over the muscles arising from the medial

epicondyle of the humerus and was covered by the deep fascia of the forearm, pierced the deep fascia proximal to the wrist, crossed the flexor retinaculum, entered the palm, and formed the superficial palmar arch, which was completed by the superficial palmar branch of the radial artery. Throughout its course, this artery gave no branch. In the left upper limb the arterial pattern was normal.

Figure 1. Showing Photographic presentation of Unusual Branch of Brachial Artery

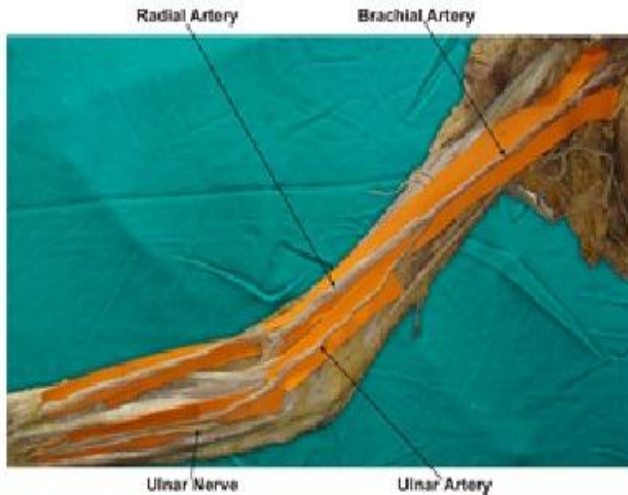
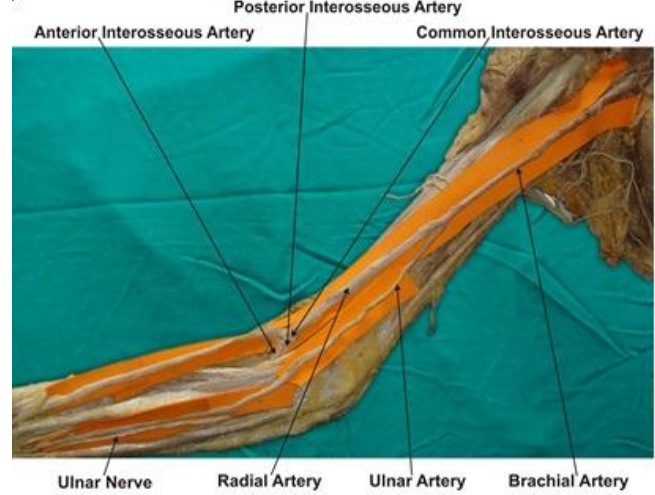


Figure 2. Showing Photographic presentation of Unusual Origin and Course of Ulnar Artery



DISCUSSION

Variations of the arterial pattern of the upper limb are common and have been reported earlier [2-14]. Supernumerary accessory branches may arise from the brachial artery [15].

Ulnar artery was found to deviate from its usual mode of origin in one in thirteen cases; frequently it sprang from the lower part of the brachial artery; the position of the ulnar artery in the forearm was more frequently altered; in cases of high origin, it invariably descended over the muscles arising from the medial epicondyle of the humerus and was covered by the deep fascia of the forearm. The present case of ulnar artery is somewhat similar to the variations presented in Quain's Anatomy.

EMBRYOLOGICAL BASIS

If the brachial artery is taken to terminate into radial and ulnar arteries, the embryological basis of the existing ulnar artery and the origin and course of the unusual branch of the brachial artery, replacing the ulnar artery in the present case, is as follows. Primitive axis artery and superficial brachial artery are implicated in the morphogenesis of the arteries of the upper limb [16]. The seventh cervical intersegmental artery forms the axis artery of the upper limb (Fig. 3a) and persists in the adult to form the axillary, brachial, and interosseous arteries (Fig. 3b). Transiently, the median artery arises as a branch of the interosseous artery, begins to regress and remains as a

residual artery (Fig. 3b) accompanying the median nerve. Radial and ulnar arteries are later additions to the axis artery. An ulnar artery and a median artery are branches (Fig. 3c) of the axis artery. A superficial brachial artery is a consistent embryonic vessel, coexisting or not with the brachial artery [17]. It has two terminal branches (Fig. 3d): a lateral that continues as a part of the definitive radial artery [18] and a medial, superficial antebrachial artery, which divides into median and ulnar artery branches, which are the trunks of origin of the median and ulnar arteries (Fig. 3d). These trunks of deep origin predominate and the superficial arteries regress. In the present case, the axis artery had formed the interosseous artery and given the trunks of the median and ulnar arteries. The ulnar branch of the superficial antebrachial artery (Fig. 3e) persists independently, without its usual anastomosis to the branch of the axis artery, as the large lateral branch of the brachial artery and the superficial ulnar artery, which is found in the distal part of the forearm and joins the superficial palmar arch. If the brachial artery is taken to terminate into radial and interosseous arteries, the simpler embryological basis of the interosseous artery and the origin and course of the unusual branch of the brachial artery, replacing the ulnar artery, is the following. It appears probable that the abnormal arrangement results from early obstruction of the ulnar artery below the origin of the interosseous, and the development of a superficial vas aberrans, which replaces the portion of vessel below



the obstruction and unites with the brachial. The interosseous artery in such cases of abnormality thus comprises not only the interosseous artery but also the portion of ulnar artery above the obstruction and in accordance with this view; the recurrent branches are derived from it.

CONCLUSION

The present anomaly is very rare and does not seem to have been reported. This case is of significance. Such an artery may present a superficial pulse and a hazard to venipuncture [19] and lead to intra-arterial injections or ligature instead of the vein in the cubital fossa [20,21]. Variation in the branching pattern of the brachial artery is of significance in cardiac catheterization for angioplasty, pedicle flaps, arterial grafting or brachial pulse.

COMPETING INTERESTS

The authors declare that they have no competing interest.

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AUTHORS' CONTRIBUTIONS

LS wrote the case report, SPS performed the literature review, SR obtained the photograph for the case, RMM performed the literature search and RU assisted with writing the paper. STS helped to draft the manuscript. All authors have read and approved the final version manuscript.

ACKNOWLEDGEMENT

All the authors wish to convey our sincere thanks to our Dean Dr. Geeta Niyogi Madam for her valuable help, support and inspiration. We are also thankful to Mr. M. Murugan. Authors also acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.



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