



Superficial Ulnar Artery & Its Clinical Importance

KEYWORDS

Superficial ulnar Artery, variation, upper limb

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ABSTRACT Variations in the major arteries of the upper limb are estimated to be present in up to one fifth of people, and may have significant clinical implications. Anatomical variations in the arterial pattern of the upper limb are very common. The superficial ulnar artery is one of the rare variations amongst them and usually arises from Axillary or Brachial artery and lies superficial to the forearm flexor muscles. We present here a case of superficial ulnar artery found during the routine dissection of left upper limb of a 50-year-old male cadaver where we have observed a superficial ulnar artery crossing over the bicipital aponeurosis and forearm flexor muscles. Such artery may impose diagnostic as well as surgical errors. Hence existence of superficial ulnar artery becomes an interesting subject to Surgeons, Radiologists as well as to Anatomists.

INTRODUCTION

The brachial artery which is the continuation of axillary artery ends at the level of neck of the radius by dividing into radial and ulnar artery. In the forearm the ulnar artery initially lies on the brachialis and deep to the pronator teres, flexor carpi radialis, Palmaris longus and flexor digitorum superficialis. It subsequently lies on the flexor digitorum profundus, between flexor carpi ulnaris and flexor digitorum superficialis, and is covered by the skin, superficial and deep fascia. It crosses the flexor retinaculum lateral to the ulnar nerve and pisiform bone to enter the hand and contribute in the formation of superficial palmar arch. The term superficial ulnar artery is applied to an artery which may branch from the axillary or brachial artery. The artery takes superficial course over forearm flexor muscles [1, 2]. The existence of superficial ulnar artery is a rare anatomical variation having clinical significance [2, 3]. The anomalous artery was usually quiet easily discovered outlined on the skin surface just below the medial half of the skin crease in front of the elbow. It is noteworthy that a well marked superficial veins always accompanied the artery closely on one side or other as a companion vein [4]. Its incidence ranges from 0.75 to 3.3%. [5] The superficial ulnar artery has been reported with different terminologies; arteria antebrachialis superficialis ulnaris [5-7] high origin of the ulnar artery [8,9] and superficial ulnar artery with a high origin. [10].

Material and Methods

During routine cadaveric dissection in department of anatomy, we noted an unusual pattern of ulnar artery in relation to the flexor group of forearm muscle, bicipital aponeurosis and median nerve in a middle aged male cadaver on left side of upper limb. Ulnar artery, its branches and its entire course was traced, and appropriate photographs were taken for proper documentation.

Case Report

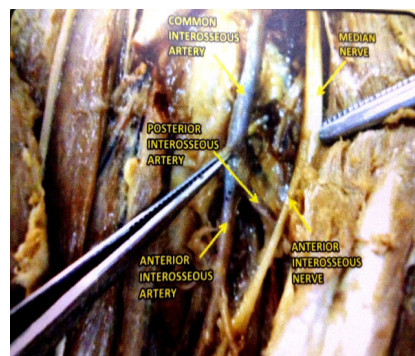
During routine dissection of upper limb in a middle aged (50 years) male cadaver, we noted the following unusual course of ulnar artery on left side.

The ulnar artery was arising from the medial side of the upper one-third of the brachial artery. It was descending deep to the deep fascia. One inch above the elbow, piercing the deep fascia it came to lie superficial to the bicipital aponeurosis. At the cubital fossa the artery crossed from the medial to the lateral side and passed superficial to the muscles arising from the medial epicondyle [Fig 1].



Fig [1]:- Showing superficial course of ulnar artery.

At the distal third of the forearm the course of the ulnar artery was normal and passed superficial to the flexor retinaculum to form the superficial palmar arch as usual. There were no branches throughout its course in the forearm and it was running superficial to the deep fascia. The radial artery was larger and took a normal course. All the branches which are usually the branch of ulnar artery are here reported arising from radial artery. Radial artery gave a common trunk which after giving anterior and posterior ulnar recurrent artery divides into anterior and posterior interosseous artery. [Fig2]. The arterial pattern of the right upper limb was normal and showed no abnormality.



Fig[2] -Showing different branches arising from radial artery.

DISCUSSION

Variations of the upper limb arterial system are well documented [2,11,12].

The presence of a superficial ulnar artery seems to be a rare variation with an incidence of 0.7%–7% in the literature[2,11,12]. Its clinical importance should not be underestimated as several cases of intra-arterial injection of drugs and subsequent amputations have been reported [13,14].

The superficial ulnar artery was described in numerous articles as an anatomic variation, as well as being a possible risk factor for accidental intra arterial infusion, for sacrificing the vessel by mistake during surgery. Furthermore, it can cause problems in brachial arterial catheterization.[15,16]

The superficial ulnar artery may be diagnosed clinically by careful palpation of the antecubital fossa and forearm.[17,18].

Nevertheless, there is always the risk of damaging a superficial ulnar artery if it is present.

Superficial ulnar artery always be in good size and usually contributed to the superficial palmer arch [19].

The superficial position of the ulnar artery makes it more vulnerable to trauma resulting in haemorrhage and may complicate intravenous drug administration. Superficial ulnar artery may complicate some surgical procedures leading to ischemia of the forearm [20].

EMBRYOLOGICAL BASIS

The 7th intersegmental artery forms the axis artery of the upper limb. The axis artery gives rise to the axillary, brachial and interosseous arteries. Other branches are added subsequently to the axis artery. First is the median artery. The ulnar

and the radial arteries arise from the axis artery later. Because of this temporal succession of emergence of principle arteries, anomalies of forearm vasculature occur. This sprouting theory is greatly challenged by the study of Rodriguez et al 2001. Their findings suggest that the arterial pattern of the upper limb develops from an initial capillary plexus by a proximal and distal differentiation, due to maintenance, enlargement and differentiation of certain capillary vessels, and the regression of others. The embryological basis of arterial variations could be described by modification of normal capillary maintenance and regression.

CLINICAL SIGNIFICANCE

Superficial position of the ulnar artery makes it more vulnerable to trauma and thus haemorrhages. In our described case the ulnar artery was superficial to the bicipital aponeurosis and in a clinical setting such a variant could easily be mistaken for a vein. Such misinterpretation could lead to intra-arterial injection and difficulties in angiographic procedures. It also has would have a higher risk of getting damaged during forearm surgery. The knowledge of such variation is important; not only for surgeons but also for other medical and nursing staff because intravascular canulations are commonly performed by them.

CONCLUSION

Since a superficial ulnar artery is actually not very rare, there is a fair chance that clinicians may encounter this anomaly. Therefore, one should always keep in mind this anatomic variation and try to detect it before any technical procedure in the upper limb. Owing to its surgical importance, variations of the ulnar artery merit description.

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