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THE SUPERFICIAL ULNAR ARTERY WITH ABSENT SUPERFICIAL PALMAR ARCH- A CASE REPORT

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Abstract

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. During routine undergraduate dissection, 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. The case report presents unilateral left side superficial ulnar artery along with absence of superficial palmar arch and regressed ulnar artery in reference to review literature, embryogenesis and its clinical significance.

Key words: Artery, variation, upper limb, superficial palmar arch

Introduction

The axillary artery, a continuation of the subclavian artery, begins at the outer border of the first rib and ends at the inferior border of teres major where it becomes the brachial artery. Pectoralis minor crosses over it and divides it into proximal, posterior and distal to the muscle. The brachial 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. About a third of the superficial palmar

arches are formed by the ulnar artery alone; a further third by contribution from the superficial palmar branch of the radial artery and a third by the arteria radialis indicis [1]. The arch gives three common palmar digital arteries to the medial three fingers and also to the medial half of the index finger. The lateral aspect of the index finger and the thumb normally receive their arterial supply from the radial artery through the radialis indicis and the princeps pollicis arteries, respectively. 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 [2, 3]. The existence of superficial ulnar artery with higher origin from axillary artery is a rare anatomical variation having clinical significance [3, 4]. The anomalous artery was usually quiet easily discovered outlined on the skin surface just below the medial half of the skin crease in front

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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 [5].

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During routine anatomical dissection class for medical undergraduate students at Government Medical College Ambedkarnagar, U.P, we have observed a unilateral case of superficial ulnar artery in an elderly 70 year old male human cadaver. The superficial ulnar artery was present in left upper limb arising from axillary artery. There was regression of the ulnar artery with the absence of superficial palmar arch. The arterial course and branching pattern was normal on the opposite side. The course and relation of the anomalous artery was studied carefully.

Results

In the present case an anomalous artery arose from the second part of the axillary artery in the axilla. It then cross over the medial root of the median nerve and descend along the arm lying superficial and medial to the median nerve. In arm it gives three muscular branches to the biceps brachii. At the cubital fossa the artery passes over the bicipital aponeurosis and takes oblique course downwards and medially towards ulnar border lying subjacent to antebrachial fascia but superficial to the forearm flexor muscles. At distal part of the forearm it lies between the flexor carpi ulnaris and flexor digitorum superficialis muscle. The artery then passed superficial to the flexor retinaculum lying lateral to the ulnar nerve. The artery ends by dividing into two terminal branches by replacing the superficial palmar arch in hand. The superficial ulnar artery was of a small caliber than both radial and ulnar artery. The brachial artery at the neck of the radius divided into radial and ulnar artery. The ulnar artery after giving common interosseous branch runs underneath flexor carpi ulnaris with progressively decreasing caliber and regressed in the distal part of the forearm.

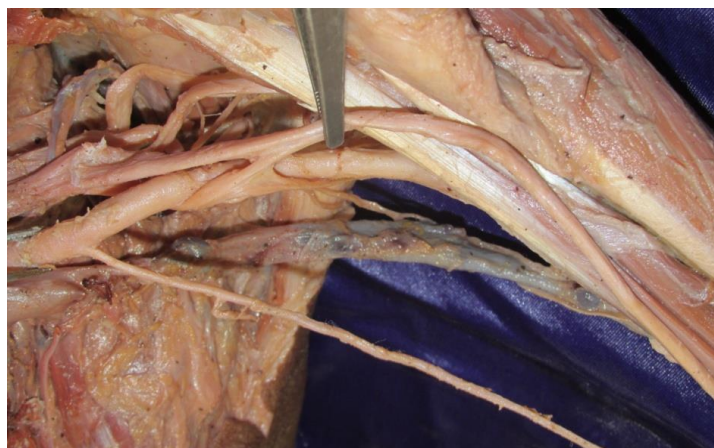


Figure1: Photograph showing origin of superficial ulnar artery from the second part of the axillary artery in axilla.

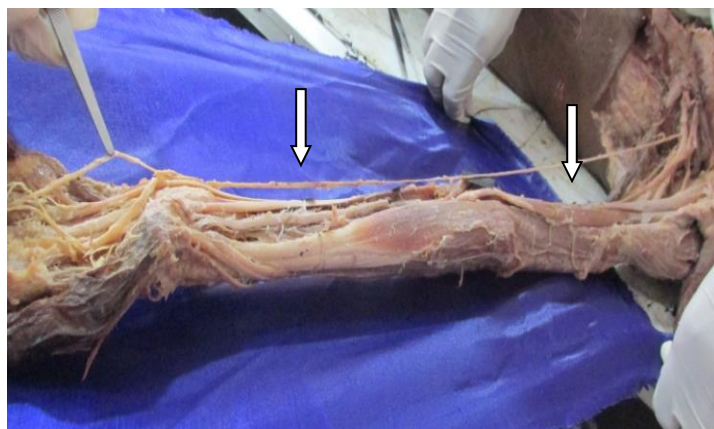


Figure2: Photograph showing extension and course of the superficial ulnar artery in upper limb.



Figure 3: Photograph showing regression of the ulnar artery in the forearm.

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Figure 4: Photograph showing two terminal branch replacing the superficial palmar arch in hand

Discussion

Various variations in arterial pattern of upper limb have been reported by various authors[6,7,8,9]. A total incidence of 0.67-7% for the superficial ulnar artery have been reported[3,10,11]. However the superficial ulnar artery arising from axillary artery is rare ranging from 1.04-2%[3,8,12]. The course of superficial ulnar artery may vary- it may run subcutaneously over the deep fascia of forearm or rarely it runs underneath antebrachial fascia[3], as observed in our case. Superficial ulnar artery always be in good size and usually contributed to the superficial palmar arch [6]. In the present case this artery has small caliber and it was not contributing in the formation of superficial palmar arch. Various developmental theories regarding arterial pattern of the upper limb have been proposed by authors. According to sprouting theory the arteries of the limb sprout from the axis artery[13]. Some authors suggest the arterial pattern might be the result of differentiation and regression in initial capillary plexus[8]. Possibly the presence of superficial ulnar artery could be a result of genetic predisposition, hemodynamic forces, limb movements and various chemical inducers[14]. 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 [5]. The presence of a superficial ulnar artery is clinically important while raising forearm flaps during reconstructive surgery [4]. The superficial ulnar artery may lead to misinterpretation of incomplete angiographic images[11]. In plastic surgery, it could be helpful if it is diagnosed preoperatively, a reliable flap can be designed over the superficial ulnar artery[4].

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.

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