CASE REPORT

High origin of ulnar artery in South Indian male cadaver: a case report

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Abstract
Superficial ulnar artery, a rare variation may arise from axillary or brachial artery. Here we report a case of high origin of superficial ulnar artery from the axillary artery. Superficial ulnar artery, after running under the bicipital aponeurosis in the cubital fossa, it terminated as superficial palmar arch in the hand. We also discuss its clinical and embryological relevance.

Keywords: superficial ulnar artery, superficial palmar arch, bicipital aponeurosis, axillary artery.

Introduction
Ulnar artery usually arises from brachial artery as one of its terminal branch in the cubital fossa. Very rarely, the superficial ulnar artery (SUA), which arises from the axillary, brachial or superficial brachial arteries and courses over the forearm flexor muscles and coexists with a brachial or superficial brachial artery that branches into either the radial and common interosseous arteries or, less frequently, into the radial and an additional ulnar arteries [1, 2].

Although, variations of the upper limb arterial pattern are common, the presence of a SUA of high origin, from the axillary artery, is considered as a rare anatomical variation with clinical significance [2–5].

This report presents a case of unilateral SUA, arose from the axillary artery along with its embryological explanation and clinical significance.

Material and Methods
During routine dissection of 43 cadavers, in the left upper limb of a 65-year-old south Indian male cadaver, we found a superficial ulnar artery arising from the axillary artery.

Results
The SUA originated from the left axillary artery at the level of the junction of the two median nerve roots, in close proximity with the inferior border of teres major muscle (Figure 1).

The SUA after crossing over the lateral root of the median nerve runs close and medial to the median nerve in the upper and middle thirds of the arm close to the biceps brachii muscle.

In the inferior third of the arm, the SUA was seen running medial to median nerve on brachialis muscle.

In the cubital fossa, the SUA passed deep to the bicipital aponeurosis and then ran in the ulnar side of the forearm superficial to the forearm flexor muscles (Figure 2).

On reaching the hand, the SUA anastomosed with the small twigs from the radial artery to form the superficial palmar arch (Figure 3).

After the origin of the SUA, the axillary artery continued as the brachial artery and divided into radial and common interosseous arteries in the cubital fossa (Figure 4). However, such variation was absent on the other side.

Discussion
The superficial ulnar artery (SUA) is an anatomical variation of the upper limb vasculature, which has a prevalence of 0.7–9.4% in the population [6].

The SUA runs superficial to the flexor muscles of the forearm, whereas the normal ulnar artery runs deep and then divides into the anterior and posterior interosseous arteries.

Lippert H and Pabst R (1985) has described that the artery crosses over the lateral root of the median nerve and supplies the biceps brachii muscle as a rare variation [7].

The same variation was observed in our dissection. The Course of SUA over the forearm flexor muscles and underneath the bicipital aponeurosis was also observed in this case, which is also not well reported in the literature.

Many theories on the development of the arterial system of the upper limb have been proposed over the last two centuries, but none of the studies have yet reached unanimous conclusion.

Recently, Rodriguez-Niedenführ M et al. (2001) carried out a large embryological study and proposed that the normal arterial system develops by selective enlargement or regression of a capillary plexus and not by budding from a main axial trunk [8].
Figure 1 – Showing the origin of the superficial ulnar artery (SUA) from the axillary artery (AA).
LRM – lateral root of median nerve,
MRM – medial root of median nerve,
MN – median nerve

Figure 2 – Showing the course of superficial ulnar artery in the lower third of arm and the cubital fossa. The superficial ulnar artery (SUA) at the cubital fossa, where it runs deep to bicipital aponeurosis (BiA).
MN – median nerve, BA – brachial artery, RA – radial artery

Figure 3 – Showing the superficial ulnar artery (SUA) passing through the lower third of forearm and forming the superficial palmar arch (SPR) in hand by joining with small branches (SRA) from the radial artery (RA).
UN – ulnar nerve

Figure 4 – Branches of the brachial artery (BA) in the cubital fossa. Brachial artery divides into common interosseous artery (CIA) and radial artery (RA).
SUA – superficial ulnar artery, MN – median nerve

Thus, SUA may be the result of persistence of one of the capillary bud from the axillary artery. This proximal to distal differentiation into the arterial tree gives a simpler explanation for the large variation as the one described in this case.

Apart from the anatomical rarity of a SUA branching from the axillary artery, the persistence of such a vessel, which usually runs along and crosses over subcutaneous veins, is clinically important. A SUA may complicate intravenous drug administration with disastrous results, venipuncture in general and percutaneous brachial catheterization. Owing to its course, it is more prone to injury, resulting in bleeding. Additionally, the artery may be mistaken for a vein, or near the distal end of the forearm, it might be mistaken for a persistent median artery [9, 10].

The knowledge of SUA is also important in following clinical/surgical interventions: (1) As ulnar artery may be used as microvascular recipient or donor vessels, a knowledge of arterial variations is essential in planning surgical and reconstructive procedures; it is also important in ascending catheterization and surgical intervention required in patients with thrombosed forearm artery and poor collateral circulation; (2) While treating the rupture of distal bicipital tendon, orthopedic surgeon should be aware of this atypical blood vessel; (3) The presence of an SUA need not always be regarded as an adverse feature, as its presence may allow plastic surgeons to use it in a reconstructive ulnar flap [5].
**Conclusions**

Knowledge of this variation is very important, not only to anatomists, but also to angiologists, radiologists and orthopaedic, plastic surgeons during their routine clinical practice.

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**References**


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