

## **Bilateral superficial brachioulnar artery in a cadaver along with bilateral absence of palmaris longus**

Sir,

We present a cadaveric case report which illustrates superficial ulnar artery (SUA) bilaterally. This subject also had a bilateral absence of palmaris longus and persistence of median artery in the right limb, which makes this case unique with a constellation of variations in both upper limbs. We briefly review other reported cases to discuss the occurrence of SUA variant and its importance.

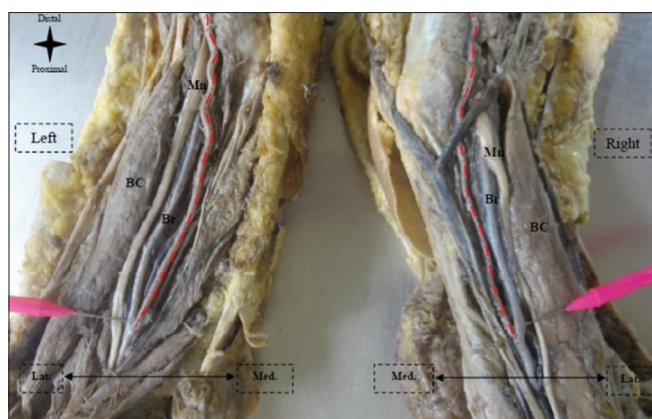
The subject is a female cadaver of Indian ethnicity. No scar or incision marks were found on the upper limbs. On the right side, the ulnar artery arose as a branch from the brachial artery [Figure 1] and ran a superficial course just deep to the median cubital vein [Figure 2]. It then ran over the superficial forearm flexors and came to lie lateral to the flexor carpi ulnaris and ulnar nerve in the distal forearm [Figure 3]. The ulnar artery continued as the superficial palmar arch which anastomosed with the 'persistent' median artery which had coursed through the carpal tunnel along with the median nerve [Figure 4]. The median artery is an embryonic vessel that usually regresses during development. On the left side, the origin of the ulnar

artery was similar to that of the right side [Figure 1] and ran near and deep to the basilic vein [Figure 2]. It coursed superficial to the superficial forearm flexors to reach the position in distal forearm lateral to flexor carpi ulnaris and ulnar nerve [Figure 3]. It continued as the superficial palmar arch which was completed by anastomosing with a palmar branch of the radial artery by burrowing the base of the thenar muscles [Figure 5]. Interestingly, palmaris longus muscle was absent in both the limbs [Figure 3].

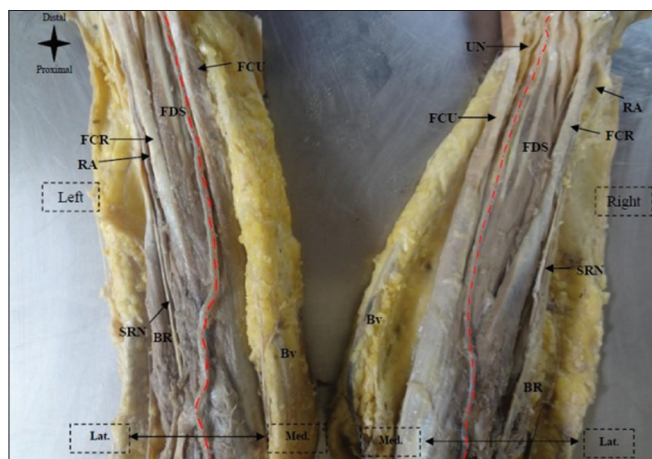
The SUA is a potential hazard when trying to cannulate the superficial veins (median cubital vein or basilic vein) in the cubital fossa. There have been reports of inadvertent intra-arterial cannulation into the SUA in elbow<sup>[1]</sup> on attempted 'intravenous' cannulation. Although rare, such accidents can result in disastrous outcome, if irritant

drugs are introduced, due to local ischaemia following vasospasm resulting in necrosis of tissue.

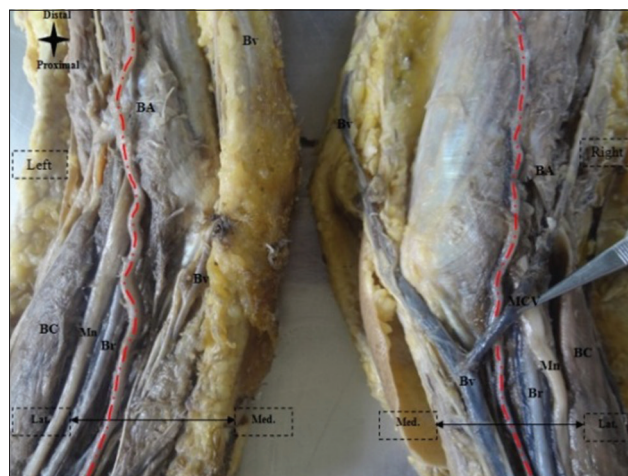
The SUA is also important in reconstructive surgeries. The first report of the superficial ulnar 'trap' was made by Fatah *et al.* as he first stated the importance of identifying this variant while raising a radial artery forearm flap.<sup>[2]</sup> The raising of a free forearm flap based on radial artery makes the upper limb solely dependent on the ulnar artery. However, if the ulnar artery is an SUA, then there is a risk of it being injured as it may be mistaken to be a superficial vein.



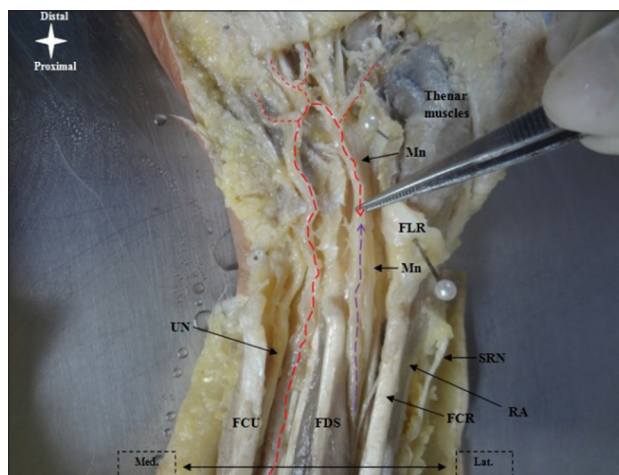
**Figure 1:** The photograph of both arms showing the origin of ulnar artery (pointed with pink pins) and its initial course (shown with red dashed lines). BC: Biceps brachii muscle, Mn: Median nerve, Br: Brachial artery, Med.: Medial, Lat.: Lateral



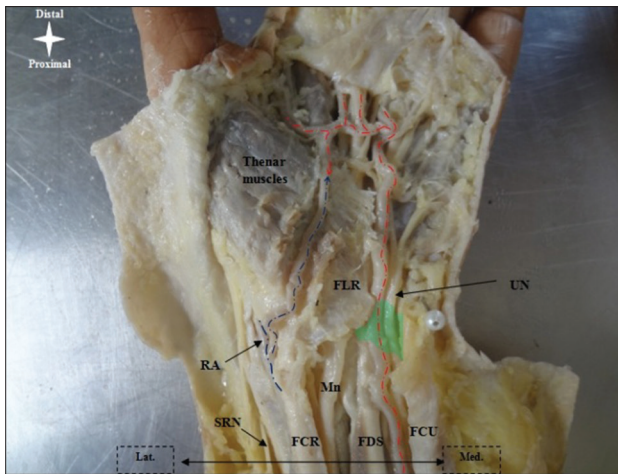
**Figure 3:** The photograph of both forearms showing the relation of ulnar artery (shown with red dashed lines) superficial to the forearm flexors to lie at the normal position distally. Note the absence of palmaris longus on both sides. Bv: Basilic vein, BR: Brachioradialis muscle, SRN: Superficial branch of radial nerve, FCR: Flexor carpi radialis, FDS: Flexor digitorum superficialis, FCU: Flexor carpi ulnaris, RA: Radial artery, UN: Ulnar nerve



**Figure 2:** The photograph of both elbows showing the relation of ulnar artery (shown with red dashed lines) and the cubital fossa structures. Note the relation of the superficial veins to the artery. Note the relation of ulnar artery to the bicipital aponeurosis. BC: Biceps brachii muscle, Mn: Median nerve, Br: Brachial artery, Bv: Basilic vein, BA: Bicipital aponeurosis, MCV: Median cubital vein



**Figure 4:** The photograph of the right hand showing the formation of superficial palmar arch (shown with red dashed lines) superficial to the flexor digitorum tendons. Palmar aponeurosis is reflected to the distal side. Note the anastomosis with the persistent median artery (shown with purple dashed lines). The flexor retinaculum is cut and reflected using stay pins. FCU: Flexor carpi ulnaris, FDS: Flexor digitorum superficialis, FCR: Flexor carpi radialis, RA: Radial artery, SRN: Superficial branch of radial nerve, Mn: Median nerve, FLR: Flexor retinaculum, UN: Ulnar nerve



**Figure 5:** The left hand showing the formation of superficial palmar arch (shown with red dashed lines) superficial to the flexor tendons. Note the anastomosis with the superficial palmar branch of radial artery (shown with blue dashed lines) which is seen burrowing the thenar muscle fibres. The flexor retinaculum is intact. Guyon's canal is opened (shaded as green). FCU: Flexor carpi ulnaris, FDS: Flexor digitorum superficialis, FCR: Flexor carpi radialis, RA: Radial artery, SRN: Superficial branch of radial nerve, Mn: Median nerve, FLR: Flexor retinaculum, UN: Ulnar nerve

An interesting concurrence between the arterial variants and anomalies of palmaris longus has been observed in multiple reports. In one report by Yazar *et al.*,<sup>[3]</sup> there was inverse palmaris longus bilaterally along with SUA. In another report by Kachlik *et al.*,<sup>[4]</sup> there was a superficial brachio median artery with bitendinous palmaris longus.

In the study on 139 patients by Yadav *et al.*,<sup>[5]</sup> they intraoperatively recognised SUA in the two cases which had a unilateral absence of palmaris longus, but the other 137 cases including the six with bilateral absence of palmaris longus did not have SUA. They suggested that the unilateral absence of palmaris longus can be a warning sign for avoiding the superficial ulnar 'trap'.<sup>[5]</sup> It is surprising that Yadav *et al.* discovered an incredible 100% sensitivity and 100% specificity for the SUA, if palmaris longus was absent unilaterally but not bilaterally. We understand that the conclusion by Yadav *et al.* may not be completely true in all cases as in our report, there is bilateral absence of palmaris longus with bilateral SUA, and there has also been a case where palmaris longus was seen in SUA variant,<sup>[6]</sup> and as mentioned above, there were reported cases where aberrant morphologies of palmaris longus were seen with SUA variants.<sup>[3,4]</sup>

The present report and the brief review of previous reports show the importance of SUA in plastic surgery and in intravenous drug administration and an interesting pattern of palmaris longus anomalies/absence in some of the cases with SUA, while they were present in some.

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## Conflicts of interest

There are no conflicts of interest.

**Doris George Yohannan,  
Komalavallyamma Chandrakumari**

Department of Anatomy, Sree Gokulam Medical College and Research Foundation, Thiruvananthapuram, Kerala, India

## Address for correspondence:

Dr. Doris George Yohannan,  
Department of Anatomy, Sree Gokulam Medical College  
and Research Foundation, Venjaramoodu,  
Thiruvananthapuram, Kerala, India.  
E-mail: dorisgeorge54@gmail.com

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