

UNILATERAL PRESENCE OF SUPERFICIAL ULNAR ARTERY: A CASE REPORT

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ABSTRACT

The variations in the arterial pattern of upper extremities are not uncommon. During routine dissection of right upper extremity of 55 years old male cadaver we found brachial artery gave an unusual branch, a superficial ulnar artery (SUA), just before its termination into radial & ulnar arteries. It ran superficial to the bicipital aponeurosis & muscles of front of forearm. The knowledge of variation in arterial pattern of upper limb is of great importance since many surgical and invasive procedures are performed on it. Also the course of SUA makes it prone for inadvertent intra-arterial injections misinterpreting it as vein. So nurses, medical students & clinicians should be aware about this variation.

KEY-WORDS: Brachial Artery; Superficial Ulnar Artery; Intra-Arterial Injection

Introduction

Brachial artery is the main arterial supply of the arm. It terminates in the cubital fossa into radial & ulnar arteries. These two arteries along with their branches supply all the structures of forearm, hand, elbow joint & wrist joint. The superficial ulnar artery (SUA) is a rare branch given either by Axillary or Brachial artery.^[1] It runs superficial to flexor muscles of front of forearm & continues as superficial palmar arch in hand. Its incidence is around 0-9.38%.^[2] As upper extremity is frequently involved in many surgical & invasive procedures, it is essential to have knowledge of this variation. This report presents a case of unilateral SUA along with a review of the literature, embryological basis and explanation of its clinical significance.

Case Report

During routine dissection for undergraduate MBBS students of the right upper limb in a cadaver aged 55 years we found that the brachial artery 0.5 cm before its termination into radial & ulnar arteries in cubital fossa gave an unusual branch, superficial ulnar artery (SUA) (Figure 1). The origin, course and branches of the brachial artery were normal except the presence of SUA.

In proximal 2/3rd of the forearm, SUA was running downwards with relatively straight course in the centre of the front of forearm, having intermediate location between laterally placed radial artery & medially placed ulnar artery. Along the course, it ran superficial to the bicipital aponeurosis & muscle of front of forearm. At a level 5 cm proximal to the upper margin of flexor retinaculum there was a transversely placed communicating artery of 1 cm length joining SUA & radial artery (Figure 2). In the lower third of the forearm SUA turned medially towards the ulnar aspect of forearm & crossed the flexor retinaculum superficially to continue as superficial palmar arch in hand (Figure 3). The arch was completed by the radial artery, a branch of radial artery. The course & the branches of superficial palmar arch were normal. The ulnar artery in the cadaver gave anterior ulnar recurrent, posterior ulnar recurrent and the common interosseous artery in the cubital fossa. It then followed a normal course in the proximal part of the forearm. In the lower third of forearm ulnar artery terminated as a muscular branch to flexor digitorum profundus. The course & branches of radial artery were normal. The left upper extremity of the cadaver did not show any variation in arterial pattern.



Figure-1: Brachial Artery with 3 terminal Branches: (1) Radial Artery (RA); (2) Brachial Artery (BA); (3) Superficial Ulnar Artery (SUA)

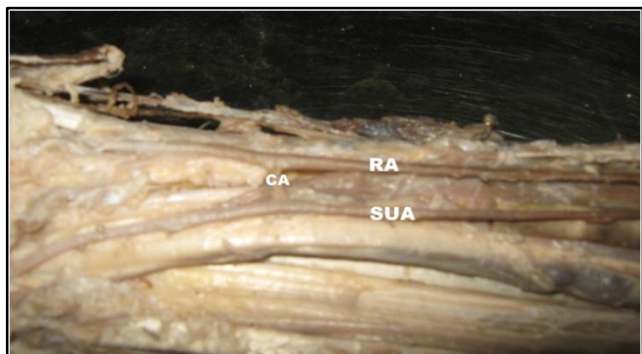


Figure-2: Superficial Ulnar Artery (SUA) communicating Radial Artery (RA) thru' Communicating Artery (CA)

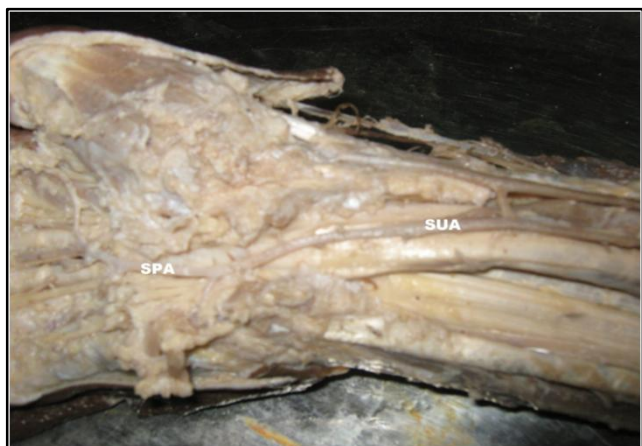


Figure-3: Superficial Ulnar Artery (SUA) continue as and in Superficial Palmar Arch (SPA) in hand

Discussion

The SUA is rare variation in the arterial patten of upper extremity. Its overall incidence as reported by various previous studies is 0 to 9.38%.^[2] The SUA arises more commonly from brachial artery, as in the present case, than from the Axillary artery.^[1] The incidence of the SUA arising from the axillary artery as reported in the literature is 0.17% - 2%.^[2] In present case SUA was observed only unilaterally. The cases with bilateral presence of SUA in the same cadaver are also reported in the literature.^[3,4] The bilateral presence of the SUA with a different origin on each side is very rare.^[4] In present case SUA arose from the lower third of the brachial artery which

is less common than from the upper third of the brachial artery.¹ In present case, the SUA ran superficial to the bicipital aponeurosis & to the muscles of the front of forearm in the subcutaneous plane. Different authors have reported different plane of course of SUA, either subfascial or subcutaneous. The subfascial course appears to be more common.¹The continuation of SUA as superficial palmar arch by passing superficial to flexor retinaculum, as observed by us is the usual mode of termination.^[1,2,5]

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.^[6] 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.^[7] The embryological basis of arterial variations could be described by modification of normal capillary maintenance and regression.^[7]

The knowledge of presence of a SUA is of great importance. The SUA is prone to direct trauma & haemorrhages because of its superficial course. Its location makes it vulnerable to be misinterpreted as vein & its accidental cannulation. The instances of inadvertent intra-arterial injection of drugs into SUA with subsequent gangrene of upper extremity are reported in the literature.^[8,9] Reconstructive surgeries using flaps are becoming increasingly common. Free forearm flaps based on the radial artery may damage the SUA causing ischemia of the hand.^[10] Sacrificing the radial artery by harvesting a radial forearm flap and damaging the superficial ulnar artery as well will lead to disastrous ischemia of the hand. Thus, it is recommended that the possibility of SUA should be ruled out by careful palpation of the cubital fossa or by Doppler ultrasound examination before performing the procedures mentioned

above.^[10,11] The SUA, if recognized preoperatively, can be used to advantage in raising a skin flap for reconstructive surgeries.^[12] Presence of a SUA can cause difficulties during the angiographic procedures.^[13]

Conclusion

The knowledge of variation in arterial pattern of upper limb is of great importance since many surgical and invasive procedures are performed on it. The course of SUA makes it prone for inadvertent intra-arterial injections misinterpreting it as vein. So nurses, medical students & clinicians should be aware about this variation.

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