

A Typical Branching Pattern of Axillary Artery in a South Indian Cadaver – A Case Report

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Abstract

Knowledge of vascular variations, especially arterial variations, is very important for surgeons, radiologists and to certain extent to the other clinicians. Awareness of the possible variations will reduce the risk of complications like bleeding during surgical procedures. Occasionally these anatomical variations of arteries may result in erroneous interpretation of angiograms by radiologists. Sometimes these variations may become advantageous for the plastic surgeons in preparation of pedicle grafts. Hence we report a rare variation of high origin of superficial brachial artery from the second part of axillary artery. Superficial brachial artery continued as the main brachial artery in the arm, and terminated as radial and ulnar arteries in the cubital fossa. However the radial artery was much narrower in diameter.

Keywords: Axillary Artery; Clinical Aspects; Profunda Brachii Artery; Superficial Brachial Artery

Introduction

According to the classical description in the standard textbooks of Anatomy, the axillary artery is explained as a continuation of the subclavian artery. It begins at the outer border of the first rib and ends at the level of the lower border of the teres major muscle as a brachial artery Susan [1]. Brachial artery variations are not uncommon; Kachlik [2] reported the origin of accessory brachial artery from the axillary artery which had joined the main brachial artery in the lower part of the arm [2]. Superficial brachial artery was reported by Al-Fayez et al. [3]. In addition to the above variations, bilateral higher division of the brachial arteries were also observed by Rossi Junior [4]. Variations of the superficial brachial artery were studied by Yang [5]; they found that the division of superficial brachial artery into the radial and ulnar arteries or superficial brachial artery that ended in the arm were the peculiar variations among Korean cadavers [5]. Aughsteen [6] reported bilateral variations in the branching pattern of the brachial arteries [6]. Singh [7] observed the coexistence of higher division of brachial artery with superficial radial artery [7].

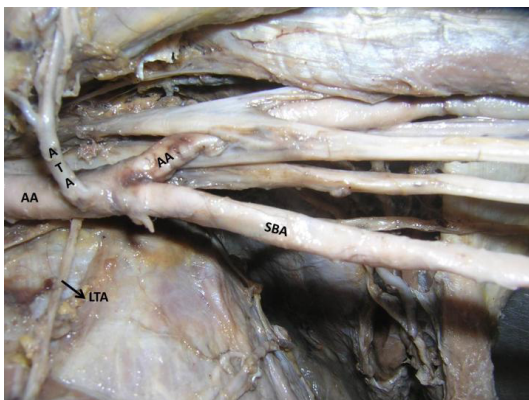


Figure 1; Dissection of left axilla after the division of pectoralis minor showing the origin of superficial brachial artery from the axillary artery; aa: Axillary artery; ata: Acromio thoracic artery; lta: Lateral thoracic artery; sba: Superficial brachial artery; mcn: Musculocutaneous nerve; un: Ulnar nerve; rn: Radial nerve; mn: Median nerve.

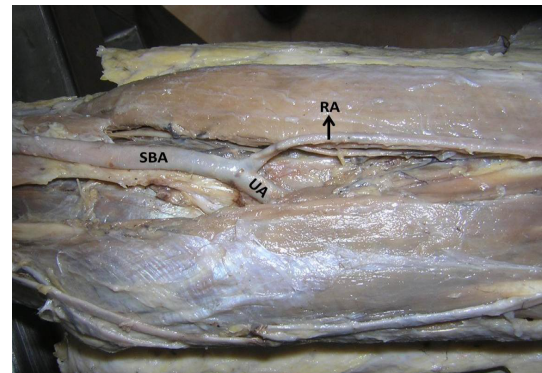


Figure 2; Dissection of left cubital fossa showing the termination of sba at cubital fossa; sba: Superficial brachial artery; ra: Radial artery; ua: Ulnar artery.

Case report

While dissecting for the undergraduate medical students, an upper limb of the formalin fixed male cadaver aged about 60 years showed an abnormal origin of the brachial artery on the left side. Axillary artery gave origin to superior thoracic artery from its first part, and the second part gave a cromiothoracic and lateral thoracic arteries. In addition to those two branches the second part also gave a large branch from its anterior aspect. This large abnormal branch (Figure 1) continued into the arm as brachial artery, passed superficial to the median nerve, entered cubital fossa and terminated as radial and ulnar arteries at the level of neck of the radius (Figure 2). However the radial artery was

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Figure 3; Dissection of left axilla showing the course of sba, third part of axillary artery and its branches and profunda brachii artery; sba: Superficial brachial artery; mn: Median nerve; rn: Radial nerve; pba: Profunda brachii artery; aa: Axillary artery; sa: Subscapular artery; pcha: Posterior circumflex humeral artery.

unusually smaller in diameter. The branches of brachial artery in the arm were normal except that the profunda brachii artery did not arise from it (Figure 3).

The third part of the axillary artery continued further between the two roots of the median nerve, and gave subscapular artery, anterior and posterior circumflex humeral arteries, after which it continued as profunda brachii artery into the lower triangular space accompanied by the radial nerve.

Discussion

While vascular variations are the commonest anatomical variations occurring in the body, brachial artery is no longer an exception to it. Most of the time, anatomical variations would not cause any symptoms or harm to the subjects who have it. However presence of anatomical variations may complicate the surgical procedure to be performed or the surgeon may need to modify the surgical approach.

The brachial artery is widely used in clinical practice as it is much closer to the heart and it is easy to approach compared to other large arteries in the body Rossi Junior et al. [4]. Kadanoff and Balkansky [8] have reported high division of the axillary artery into superficial and deep brachial arteries [8]. Sharma [9] described bilateral presence of superficial brachial artery from the third part of the axillary artery, but in the present case it arose from the second part of the axillary artery [9]. Yang [5] studied the superficial brachial artery in Korean cadavers and classified them into three types. Type I: The superficial brachial artery divided into radial and ulnar arteries in the cubital fossa and the axillary artery became the definitive brachial artery. Type II: In this case the superficial brachial artery continued as a radial artery, type III: where the superficial brachial artery terminated in the arm. Based on the origin of superficial brachial artery from axillary artery, Type I is further sub classified into type Ia: the superficial brachial artery arose proximal to the origin of the subscapular, anterior and posterior circumflex humeral arteries. Type Ib: the superficial brachial artery arose in between the origins of subscapular and circumflex humeral arteries. In type Ic: superficial brachial artery arose from the second part of the axillary artery [5]. The current case is somewhat similar to type Ic as reported by them, the only difference being the continuation of axillary artery as profunda brachii artery in our case.

Superficial brachial artery is a constant embryonic vessel that plays a pivotal role in the development of arterial system of the upper limb. A possible embryological explanation was proposed by Patnaik [10] about the development of superficial brachial artery. According to them, a communicating branch develops between the superficial and main brachial arteries. Later in normal development proximal part of superficial brachial artery disappears, but in case of the presence of superficial brachial artery, it is the proximal part of main brachial that disappears and leads to the development of superficial brachial artery which replaces the main brachial artery [10].

Since superficial brachial artery passes superficially in the arm it is at high risk for trauma, and it can be mistaken for a vein and may result in administration of drugs which lead to gangrene and several other complications. It can be avoided by careful palpation of the vessel before the administration of any drug. Nowadays radial artery is the common choice for the angiography. If the subjects with present variation undergo the transradial or transulnar approach for angiography, it may result in failure of passage of catheter because the superficial brachial artery branches out at right angle from the second part of the axillary artery. The present variation may mislead the radiologists during colour Doppler studies and digital subtraction studies. However, the present variation is useful in skin flaps like medial skin free flap Yang [5]. These variations should be given attention to because of their importance in microvascular and reconstruction surgeries.

References

1. Susan Standring (2008): Gray's Anatomy. Churchill Living stone Elsevier, Spain
2. Kachlik D, Marek K, Miroslav U, Vaclav B (2011) Accessory brachial artery: a case report, embryological background and clinical relevance. *Asian Biomedicine* 5: 151-155.
3. Al-Fayez MA, Kaimkhani ZA, Zafar M, Darwish H, Aldahmash A, et al. (2010) Multiple arterial variations in the right upper limb of a caucasian male cadaver. *Int J Morphol* 28: 659-665.
4. Rossi Junior WC, Esteves A, Simoes JS, Fernandes GJM (2011) Bilateral high division of the brachial artery in one human male cadaver: case report. *J Morphol Sci* 28: 204-207.
5. Yang HJ, Gil YC, Jung WS, Lee HY (2008) Variations of the superficial brachial artery in korean cadavers. *J Korean Med Sci* 23: 884-887.
6. Aughsteeen AA, Hawamdeh HM, Khayat MA (2011) Bilateral variations in the branching pattern of brachial artery. *International Journal of Anatomical Variations* 4: 167-170.
7. Singh H, Gupta N, Bargotra RN, Singh NP (2010) Higher Bifurcation of Brachial Artery with Superficial Course of Radial Artery in Forearm. *JK Science* 12: 39-40.
8. Kadanoff D, Balkansky G (1966) Two cases with rare variations of arteries of the upper extremities. *Anat Anz* 118: 289-296.
9. Sharma T, Singla RK, Sachdeva K (2009) Bilateral superficial brachial artery. *Kathmandu Univ Med J* 7: 426-428.
10. Patnaik VVG, Kalsey G, Singla RK (2001) Bifurcation of axillary artery in its 3rd part- a case report. *J Anat Soc India* 50: 166-169.