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Case Report

Unilateral high bifurcation of brachial artery: a cadaveric case report

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ABSTRACT

The brachial artery is the chief artery irrigating upper limb. In standard conditions, the artery is continuation of axillary artery and commences at the lower border of the teres major muscle. The artery terminates at the level of neck of radius by dividing into radial and ulnar artery. But brachial artery undergoes multiple variations including high bifurcation into radial and ulnar arteries. The high division of brachial artery may take place in upper, middle and lower part of arm. The incidence of cranial bifurcation of brachial artery is reported to be 10.05%. The variation may affect the outcome of invasive procedures like catheterization, angiography, vascular and reconstructive surgeries. During routine dissection of right upper limb for first year MBBS students of 2025-26 batch, authors found brachial artery dividing into radial and ulnar arteries in upper arm. Rest of the course of radial and ulnar arteries as described in conventional literature. In the contralateral limb, there was no anomaly.

The knowledge of high division of brachial artery will be of utmost use to cardiac surgeons carrying out catheterization for uneventful procedure, for radiologist to avoid misinterpretation of radiographs and for vascular surgeons to avoid complications.

Keywords: Brachial artery, High bifurcation, Variation, Radial artery, Ulnar artery

INTRODUCTION

Brachial artery is the main artery supplying structures of anterior compartment of arm. It is continuation of axillary artery and begins at the lower border of teres major muscle.[1] The brachial artery ends by bifurcating into radial and ulnar artery at the level of neck of radius bone just caudal to elbow joint.[2,3]

In the arm, the brachial artery gives off profunda brachii, superior ulnar collateral, inferior ulnar collateral and muscular arteries.[3] These branches of brachial artery make connections with the branches of radial and ulnar arteries across the elbow joint. These anastomoses avert the chances of ischemia during movement and alterations in the position of hand.[3] The radial artery may be direct continuation of the brachial artery and traverses downwards along the lateral side of forearm up to wrist.[2,4] The ulnar artery passes beneath the flexor muscles of forearm and at the wrist it becomes superficial and gains entry in the palm by coursing superficial to flexor retinaculum.[2]

The variations in the course of the brachial artery are well documented in literature. Variations with regards to radial artery are most frequent followed by the ulnar artery and least common variations involve the brachial artery.[5] Discrepancies in standard configuration of the brachial artery is observed in 20% of population.[4] Brachial artery may be absent, or bifurcate either cranial/caudal to normal position.[6] Out of all these variations, the most common variation is high cranial bifurcation of the brachial artery and its frequency is 8% in normal population. But this frequency of this variation is found to vary in different racial groups as well in males and females.[4]

These variations are important in various surgical procedures such as aneurysm surgery, trauma, and

angiography or it may lead to intra-operative and post-operative complications.[7]

As is clear, the variations of the brachial artery particularly high bifurcation are of immense clinical significant. We also observed high division of brachial artery unilaterally in one cadaver. Aim of this study is to report this case and correlate with clinical implications.

CASE REPORT

During routine dissection of upper limb of male cadaver of age 55 years for teaching first year MBBS students of 2025-2026 batch in the department of Anatomy, authors observed high bifurcation of brachial artery on right side (Figure 1 and 2).

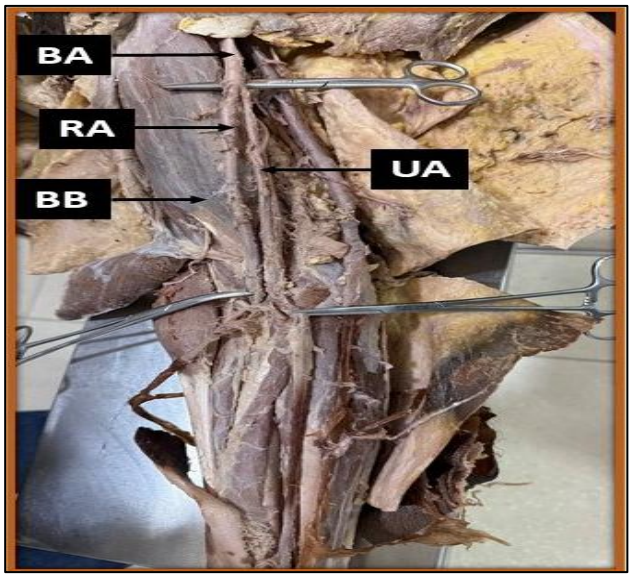

Figure 1: High bifurcation of brachial artery in left arm of a male cadaver.
*BA: brachial artery, RA: radial artery, UA: ulnar artery, BB: biceps brachii muscle.

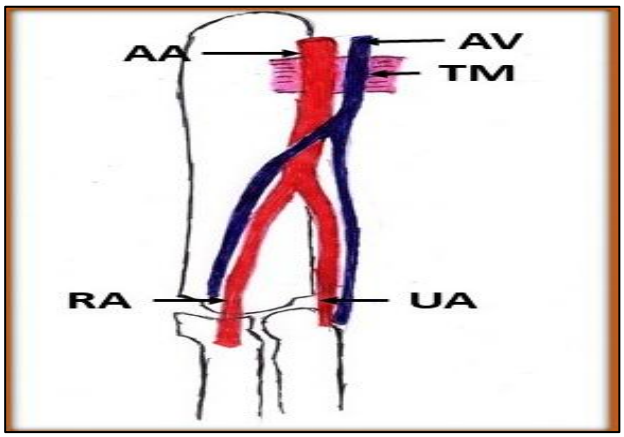

Figure 2: Figure 2: Schematic diagram displaying high bifurcation of the brachial artery.
*AA: Axillary artery. AV: Axillary Vein, TM: Teres Major, RA: Radial Artery, UA: Ulnar artery.

The upper limb was dissected using standard technique as elaborated in the Cunningham's manual. The skin and fascia were cleared and muscles, nerves and vessels of arm of this cadaver were exposed. On inspecting the arteries of right arm, we observed brachial artery bifurcated into radial and ulnar artery in the upper third of arm of right upper limb above the insertion of coracobrachialis muscle. The radial artery passed over the external surface of brachialis muscle and then coursed deep to brachio-radialis muscle. The ulnar artery traverses medially and on reaching the cubital fossa passed deep to pronator teres. On this side no other anomaly was observed in arm. On contralateral side, the configuration of neurovascular bundle was typical with no other anomaly.

DISCUSSION

The brachial artery is the chief artery of upper limb dividing into radial and ulnar artery at the level of neck of radius.[7,8]

The variations in the termination of brachial artery is well elaborated in literature. In a study, high bifurcation of brachial artery was observed bilaterally in lower third of arm in 6.7% of limb.[9] In same study, the brachial artery was found bifurcating below the neck of radius bone. In another study, high bifurcation of brachial artery in the middle 1/3rd of arm was observed in 1.72% and this anomaly was found in 3.45% at the level of lower 1/3rd of arm. These investigators also detected ending of brachial artery below the neck of radius bone.[10] The high division of brachial artery is found to exhibits racial diversity as evidenced in study by Pham et al. where the authors found higher incidence of this variation in African Americans as compared to non-African Americans.[11]

Clinical implications of high bifurcation of brachial artery: The details of brachial artery variations including high bifurcation of brachial artery into radial and ulnar artery is important for invasive diagnostic procedures such as coronary angiography.[8] The cardiac catheterizations often uses the radial artery in the forearm and the catheter is first passed in radial artery and through it successively guided through the brachial artery and then through coronary arteries.[12] High bifurcation of the brachial artery may make the catheterization procedure difficult and time taking increasing the chances of intra-operative complications like arterial dissection, thrombosis, or ischemic changes.[8] Moreover, surgical procedures such reconstructions or vascular surgery in upper limb require precise knowledge of vascular variations as unaware of these variations may culminate into inadvertent injury to these vessels along with making revascularization procedure ineffective. To prevent these complications, use of pre-operative imaging like Doppler ultrasonography or computed tomography angiography is recommended to delineate the vascular variations prior to planning of invasive procedures.[13]

It is observed that prevalence of high division of the brachial artery is highly variable which may be due

different methodology, sample size used along with region of population studied. Differences in the incidences of high division of brachial artery in various racial and ethnic groups may attributed to genetic, environmental, and developmental factors. Thus, in managing the upper limb surgical procedures, data on vascular anomalies of brachial artery in various races and ethnic groups should be used.

CONCLUSION

The arterial variations of the of brachial artery including high division is well studied. In our case, the brachial artery bifurcated into radial and ulnar artery in right upper part of arm. There is no other anomaly associated with this variation. The knowledge of such variation is of utmost use to surgeons to perform catheterization, revascularization procedures along with reconstructive procedures involving arm to minimize the intra-operative and post-operative complications.

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REFERENCES

1. Standring S. Gray's Anatomy: The Anatomical Basis of Clinical Practice. 42nd edition. Elsevier, India. 2021;921.
2. Panagouli E, Anagnostopoulou S, Venieratos D. Bilateral asymmetry of the highly bifurcated brachial artery variation. Rom J Morphol Embryol. 2014;55(2):469-72.
3. Shetty H, Patil V, Mobin N, Gowda MHN, Puttamallappa VS, Vamadevaiah RM, et al. Study of course and termination of brachial artery by dissection and computed tomography angiography methods with clinical importance. Anat Cell Biol. 2022;30;55(3):284-93.
4. Tsoucalas G, Eleftheriou A, Panagouli E. High bifurcation of the brachial artery: an embryological overview. Cureus. 2020;12(2):e7097.
5. Chakravarthi KK, Ks S, Venumadhav N, Sharma A, Kumar N. Anatomical variations of brachial artery- its morphology, embryogenesis and clinical implications. J Clin Diagn Res. 2014;8(12):AC17-20.
6. Jangir K, Singh BR, Nair N, Badge A. An Unusual High Bifurcation of the Brachial Artery: A Cadaveric Case Report. Cureus. 2024;6:16(3):e55681.
7. Tsakotos G, Natsis K, Triantafyllou G, Totlis T, Chytas D, Kostare G, et al. The axillary artery high bifurcation: coexisting variants and clinical significance. Folia Morphol (Warsz). 2024;83(1):200-6.
8. Glin M, Zielinska N, Ruzik K, Karauda P, Konschake M, Olewnik Ł. Morphological variations of the brachial artery and their clinical significance: a systematic review. Surg Radiol Anat. 2023;45(9):1125-34.
9. Sah RP, Sharma N, Kar SK, Yadav PK. Variation of the Bifurcation of Brachial Artery: A Cadaveric Study. J Universal College Med Sci. 2022;10(02):46-9.
10. Khatun S, Shah DK. Higher termination of brachial artery in cadavers in the department of anatomy of a medical college: a descriptive cross-sectional study. JNMA J Nepal Med Assoc. 2021;59(240):763-6.
11. Pham XD, Kim JJ, Parrish AB, Tom C, Ihenachor EJ, Mina D, et al. Racial and Gender Differences in Arterial Anatomy of the Arm. Am Surg. 2016;82(10):973-6.
12. Klamut H, Krupienicz A. Complications of coronarography: prevention, procedure in case of complications. Pielęgniarstwo Chirurgicznei Angiologiczne. 2014;8(4):146-50.
13. Homzar S, Grela D, Kowalczyk Z, Gierulska N, Paszczyk G, Tomaszewski M, et al. Unusually high bifurcation of the brachial artery: analysis of variants, clinical implications, and case report. Folia Morphol (Warsz). 2025;1-18.

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