

A CADAVERIC STUDY OF VARIATIONS IN THE BRACHIAL ARTERY AND ITS BRANCHING PATTERN WITH ITS CLINICAL SIGNIFICANCE

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Abstract

Background: Several variations in the course and branching pattern of brachial artery have been reported. The knowledge of these variation is of importance in reducing the risk of iatrogenic injury during procedures like performing dialysis and arteriography. The enormous progress in vascular surgeries also demands the knowledge of these variations. The aim is to observe any variations in the course and level of branching of brachial artery into its terminal branches namely radial and ulnar artery. **Materials and Methods:** This descriptive analytical study was conducted on 50 upper limb specimens in the Department of Anatomy, Annapoorana medical college and hospitals salem from Sep 2020 To Feb2021 Dissection kit was used for dissection , digital camera was used for photography of specimens, Descriptive statistics was used and results were expressed in percentage. **Result:** It was observed that in two specimens out of 48. Brachial artery terminated at a higher level in upper third of the arm 7-7.5cms above the intercondylar line. **Conclusion:** Several variations in principal arteries of upper limbs have been documented, Most common variations being high termination of brachial artery. Since brachial artery is used in various procedures like cardiac cathetrisation for angioplasty and many more procedures. The knowledge of these variations become atmost important.

INTRODUCTION

The brachial artery is a continuation of axillary artery, it begins at the inferior border of teres major muscle and terminates at the level of neck of radius into radial and ulnar artery.it is principal artery of upper limb and its terminal branches are profunda brachii artery, nutrient artery, superior, middle and inferior ulnar collateral artery and muscular branches.^[1] Several variations in the course and level of termination of brachial artery has been reported. These variations occur due to defect in embryonic development of vascular plexus of upper limb bud.^[2] Brachial artery has several clinical applications like blood pressure recording, pulsed doppler sonographic measurements, cardiac cathetrisation for angioplasty, arterial grafting.^[3] Hence a thorough knowledge of arterial variations of this region is of great importance for surgeons and interventional radiologist to avoid injuries and fatal results for their patients. This study aims to provide a detailed description of brachial artery regarding its origin, course, termination and variations in the level of termination of brachial artery.

MATERIALS AND METHODS

A descriptive analytical study was conducted in the department of anatomy, Annapoorana medical college and hospitals salem, Tamil Nadu India, from Sep 2020 to Feb 2021 Institutional ethical clearance was obtained (AMC/IEC/Proc.No.05/2020) A total of 50 upper limb specimens from 25 embalmed cadavers was used for this study.

Inclusion Criteria

Upper limbs from adult cadavers of both sexes without any deformity were included in the study.

Exclusion Criteria

Cadavers with congenital, acquired deformities of upper limb were excluded from the study.

Study Procedure: A horizontal incision in the arm at the junction of upper one third and lower two thirds and a vertical incision through the centre of the arm and forearm till the wrist was made. another transverse incision at the wrist was made and the skin flap was reflected sideways. The brachial artery was traced proximally to its origin at the lower border of teres major muscle. Distally it was traced till the upper one third of the forearm. Intercondylar line of humerus was used as reference point to measure the distance of higher termination of brachial artery. The branches of brachial artery was traced. In brachial

artery with high termination, the level at which the artery terminated was measured with nylon thread and measuring scale graduated in centimeters.^[4] digital camera was used to take picture of specimens. **Statistical Analysis:** Descriptive statistical analysis was performed using IBM SPSS Software statistics version 2.0 and tabulated on Microsoft excel for further analysis.

RESULTS

In present study it was observed that out of total 50 upper limb specimens 2(4%) specimens exhibited higher division of brachial artery into two terminal branches at upper third of the arm. In remaining 48(96%) specimens the brachial artery terminated at the level of neck of radius which is most common site of termination. The origin, course and branching pattern in all 50 specimens was normal.

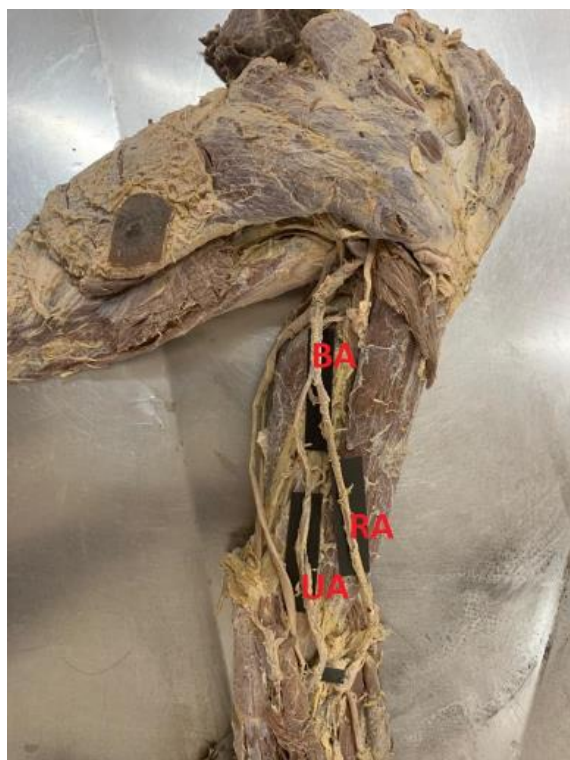


Figure 1: High division of Brachial Artery(BA) into Ulnar Artery(UA) ans Radial Artery(RA) in upper third of arm



Figure 2. High division of Brachial Artery(BA) into Ulnar Artery(UA) ans Radial Artery(RA) in upper third of arm

DISCUSSION

Arterial variations in upper limb are most common findings, they occur as a result of deviation from usual developmental process during blood vessel formation. These variations have clinical significance.^[3]

In a study done by Phalgunan et al in 2017 on 60 upper limb specimens, they observed that in 3(5%) specimens the brachial artery terminated at a higher level the distance of level of termination ranged between 7.5 cms to 13 cms above the intercondylar line of humerus.^[3] In present study 2(4%) of the specimens exhibited high termination of brachial artery and the distance ranged between 7 to 7.5 cms above the intercondylar line of humerus.

Khatun et al dissected 58 upper limb specimens in 2021 and reported that in 3(5.1%) specimens the brachial artery had higher termination in middle third of the arm and the distance of level of termination ranging from 1.5 to 14 cms proximal to intercondylar line.^[4] In present study in 2(4%) specimens the brachial artery terminated at higher level in upper third of the arm 7 to 7.5 cms above the intercondylar line of humerus.

Balakrishna et al in 2020 conducted a study on 78 upper limb specimens and observed that in 12(15.3%) specimens brachial artery terminated at a higher level the percentage is high as compared to present study in which 2(4%) specimens exhibited high termination of brachial artery.^[5]

Jayashree et al dissected 50 upper limb specimens in 2017 on 44 upper limb specimens and concluded that in 2(4%) of the specimens the brachial artery terminated at a higher level at middle of the arm. In one specimen they observed an unusual branch of brachial artery which originated below profunda

brachii artery it descended in front of medial epicondyle in superficial plane, the artery entered the palm superficial to flexor retinaculum and terminated to superficial branch which completed the superficial palmar arch and a deep branch which completed the deep palmar arch.^[6] This results of this study closely matches the present study in which 2(4%) specimens the brachial artery terminated at higher level however in none of the specimens the superficial branch of brachial artery was present.

Hemamalini et al studied 40 upper limb specimens in 2022 and reported that 9(22.5%) had high level of termination of brachial artery which was observed in 2(4%) specimens in present study.^[7]

Study conducted by ushakrishnan in 2017 on 44 upper limb specimens they concluded that in 6(13%) of the specimens the brachial artery had high termination the level at which it terminated was ranging between 5 to 10cms above the intercondylar line of humerus.^[8] Which was observed in 2(4%) of the specimens and distance of the level of termination of brachial artery was 7 to 7.5cms above the intercondylar line of humerus in present study.

George joseph et al in 2018 dissected 36 upper limb specimens and reported that in 2(5%) of the specimens the brachial artery terminated at higher level. in one specimen the brachial artery terminated at the level of upper third of the arm. And in other the level of termination was observed to be middle third of the arm.^[9] In present study 2 (4%) of specimens the brachial artery in two specimens terminated at a higher level in upper third of the arm 7 to 7.5 cms above the intercondylar line of humerus.

Gupta et al in 2012 dissected 40 upper limb specimens and observed that 4 specimens brachial artery terminated at higher level in middle third of the arm near the insertion of coracobrachialis muscle.^[10]

In present study brachial artery in 2(4%) specimens terminated in upper third of the arm.

Limitation

Sample size was limited. The findings of the study cannot be generalized as the study was done in single centre.

CONCLUSION

Several variations in principal arteries of upper limbs have been documented, Most common variations being high termination of brachial artery. Since brachial artery is used in various procedures like cardiac catheterisation for angioplasty and many more procedures. The knowledge of these variations become atmost important.

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