ABSTRACT: 28 cadavers were dissected for variations in the bifurcation of brachial artery bilaterally (n=56) at the department of anatomy, Rangaraya Medical College, Kakinada, A.P. from 2010 to 2015. Found variations during routine dissections for first year MBBS students. The findings have thrown light on the common as well as rare variants in the anatomy of brachial artery bifurcation and the course of radial and ulnar arteries in current study. 

KEYWORDS: Brachial artery, Radial artery, Ulnar artery.

INTRODUCTION: High brachial artery bifurcation is not a rare occurrence. The brachial artery usually begins as a continuation of the axillary artery at the distal (inferior) border of the tendon of teres major and ends about a centimeter distal to the elbow joint (at the level of the neck of the radius) by dividing into radial and ulnar arteries.[1] Occasionally the artery divides proximally into two trunks, which may reunite. Frequently it divides more proximally than usual and this unusually short segment brachial artery may bifurcate as usual or it may trifurcate into radial, ulnar and common interosseous arteries.[2] Several other variations related to the termination of such a short segment brachial artery have been mentioned by some earlier workers.

Such variations can be explained on the basis of embryogenic development. According to Feinberg, ectodermal-mesenchymal interactions and extracellular matrix components within the developing limb bud are controlling the initial patterning of blood vessels.[3] Knowledge of such variations has got clinical importance especially in the field of orthopedic, vascular and plastic surgeries.[4]

AIM AND OBJECTIVES:
- To study the anatomical variations in the brachial arterial anatomy at our institute.
- To search for the existence of other anatomical variations associated with high brachial artery bifurcation.

MATERIAL AND METHOD: A total of twenty eight cadavers were dissected. All bodies were south Indian in origin. No medico legal cases were included. The brachial artery and its branches were exposed after classical dissection and separation of the principal muscles of the arm and forearm related to this artery and the excision of the medial and lateral intermuscular septum of the arm, the brachial and the antebrachial fasciae. All the bodies were embalmed in the usual manner. A total 56 limbs dissected. 20 Male bodies and 8 female bodies were dissected and variations found in a female body were described and compared with reference studies.
Inclusion Criteria: All bodies were south Indian in origin. Both male and female bodies were included.

Exclusion Criteria:
- Euarcian, African, Mongolian races, pediatric age group less than 16 years excluded. Medico legal cases were excluded.
- Previous surgical procedure of A V shunt for dialysis on either limb, intervened for the purpose of PTCA and surgeries in and around elbow.
- Congenital malformations involving limbs excluded.

RESULTS & OBSERVATIONS: 20 male and 8 female cadavers were dissected. A total no of 56 upper limbs were dissected. A note of variations was observed in a female cadaver. On both sides in the same cadaver brachial artery was found divided above the level of epicondylar line of humerus instead of dividing at the level of radial neck. On the right side brachial artery divided into radial and ulnar arteries and the radial artery passed through a split tendon of biceps brachii muscle and the ulnar artery coursed superficial to the pronator teres muscle on contrary to the normal course of deep to the pronator teres muscle (figure-1). Normally brachial artery bifurcates in the cubital fossa at the level of neck of the radius beneath the biceps tendon and the radial artery courses beneath the biceps tendon into the forearm. The ulnar artery should course deep to the pronator teres muscle (figure-2). In the study on the left side of the same cadaver the brachial artery bifurcated above the level of epicondylar line of the humerus and the ulnar artery coursed superficial to pronator teres muscle. The radial artery on the left side coursed normally beneath the tendon of biceps brachii into the forearm (figure-3).

Our study showed an incidence of 3.57 % and a female preponderance.

<table>
<thead>
<tr>
<th>Total no of bodies 28</th>
<th>Left side</th>
<th>Right side</th>
<th>Variation found</th>
</tr>
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<tr>
<td></td>
<td>Male</td>
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<td>20</td>
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TABLE 1
DISCUSSION: Unilateral higher division of brachial artery at the level of middle of arm with superficial course of radial artery in upper part of forearm has been reported by Nagalaxmi.\cite{5} Guha et al. observed high up division of brachial artery into radial and ulnar arteries in the middle of the arm associated with variant median nerve and absent musculocutaneous nerve.\cite{6} It is pertinent to mention here that the normal vascular development including the patterning of the blood vessels is influenced greatly by local hemodynamic factors. Altered hemodynamic environment may give rise to variant patterning of blood vessels.\cite{7} Campta highlighted diagnostic, interventional and surgical significance of such a variation.

Further knowledge of such variation has got clinical importance especially in the field of orthopedic, plastic and vascular surgeries.\cite{4} Kian et al studied the anatomy of radial artery in 481 arms for arterio venous fistula creation through angiography in chronic renal failure patients and found High brachial artery bifurcationin 12.3\%\cite{8}. In our study we found bilateral variations with a
total incidence of 3.57 percent with a 12.5 percent of female variation. This finding is in concordance with kian et al study.

**CONCLUSION:** Every anomaly in the peripheral vascular anatomy can be related to genesis, regression or persistence of one or other segment of the embryologic axial artery. The brachial artery is often used in medical procedures, as brachial pulse palpation, blood pressure monitoring, arterial puncture, coronary angiography PTCA, selective angiography and others. Health care professionals must be aware of the possible morphologic variations of the brachial artery, as it is often used in medical procedures.
REFERENCES:


