



Case Report

## Unusual Unilateral Origin of Radial Artery from Axillary Artery- A Case Report

Anita S. Fating<sup>1</sup>, Prafulla S. Dakhane<sup>2</sup>

<sup>1</sup>Associate Professor, <sup>2</sup>Assistant Professor,  
Department of Anatomy, Dr Ulhas Patil Medical College and Hospital, Jalgaon [Khurd] 425309, M.S., INDIA

Corresponding Author: Anita S. Fating

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### ABSTRACT

An unusual unilateral origin of radial artery from third part of axillary artery on left side was observed in a middle aged female embalmed cadaver during routine dissection for MBBS batch [2013-2014] at Dr Ulhas Patil Medical College and Hospital. The knowledge of such variation is important for diagnostic, interventional and surgical procedures. Anomalous origin of the radial artery may cause failure of the radial approach of the coronary angiography.

**Key Words:** Radial artery, Axillary artery, Coronary angiography, Arterial variation.

### INTRODUCTION

Radial artery is smaller terminal branch of brachial artery and begins in the cubital fossa about 1 cm below the bend of elbow at the level of neck of radius. Brachial artery is the continuation of axillary artery. In the hand branches of radial artery and ulnar artery contribute to the formation of superficial palmar arch. <sup>[1]</sup>

Variation in the arterial patterns of upper limb in adult human body has been frequently observed either in routine dissection or in clinical practice. <sup>[2]</sup>

Sometimes the axillary artery divides into radial and ulnar arteries (anomalous high division) and is occasionally the source of the anterior interosseous artery. <sup>[3]</sup>

The advent of interventional radiology by ascending catheterization from the arteries of the upper limb should take

account of overlooked variation of the arteries of the upper limb. <sup>[4,5]</sup>

### CASE REPORT

During routine dissection [MBBS batch 2013-2014] of a middle aged female cadaver at Dr. Ulhas Patil Medical College and Hospital, Jalgaon [Khurd], MS [INDIA] an unusual unilateral origin of radial artery from third part of axillary artery on left side was observed.

The radial artery on left side arose from anteromedial aspect of third part of axillary artery near to the origin of subscapular artery. It crosses the axillary artery superficial to the fork of formation of median nerve and traversing superficially along the medial border of biceps brachii muscle, giving a branch to that muscle. In the cubital fossa, brachio-ulnar artery lies in

between median nerve medially and radial artery laterally. The subsequent course of radial artery was found to be normal.

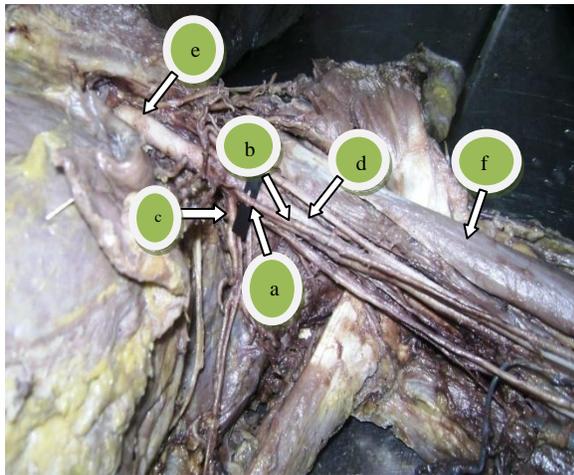


Fig no. 1: Origin of radial artery from axillary artery  
a-Radial artery  
b-Brachio-ulnar artery  
c-Subscapular artery  
d-Median nerve  
e- Axillary artery  
f-Biceps brachii muscle

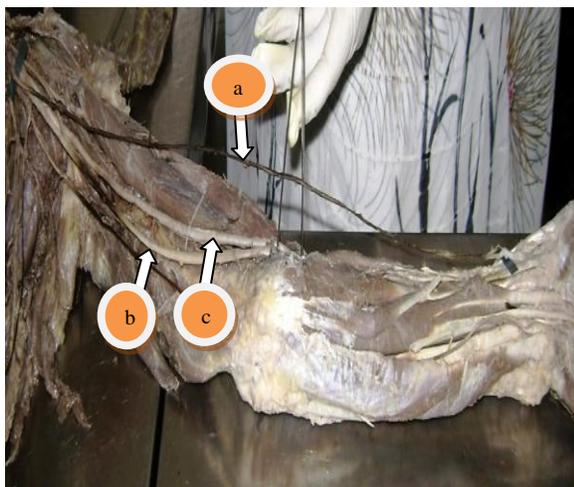


Fig no. 2: Course of radial artery  
a-Radial artery  
b-Median nerve  
c-Brachio-ulnar artery

## DISCUSSION

Variations in the major arteries of upper extremities to be 11-24% as reported by Uglietta and Kadir. [5]

Karlsson and Niechajev in angiographic observations, found high

origin of radial artery in 10% patients, the parent trunk being axillary artery in 12.5%, proximal 1/3<sup>rd</sup> of brachial in 62.5% and middle 1/3<sup>rd</sup> of brachial in 25%. [6]

Yang et al studied 304 Korean cadavers and described high origin of radial artery from axillary artery in 2.3% cases. [7] Baeza RA found the radial artery arising from axillary artery in 16 cases out of 150 cadavers. [2] Syed Rehan Daimi reported a case of high origin of radial artery from second part of axillary artery in a 70 yr old male cadaver. [8] JE Waghmare et al reported a high origin of radial artery from 2<sup>nd</sup> part of axillary artery which had bifurcated into radial and brachio-ulnar trunk in the axilla itself. The radial artery did not give any branch in the arm. [9]

As reported by Patnaik et al, axillary artery in its 3<sup>rd</sup> part at a distance of 7.5 cm from outer border of first rib and 3.0 cm proximal to the lower border of teres major [distance between outer border of first rib and lower border of teres major i.e total extent of axillary artery being 10.5 cm] divided into 2 branches. One of these branches coursed superficial to median nerve from medial to lateral side in the middle third of the arm & continued in the forerarm as radial artery. [10]

Arterial anomalies in the upper limb are due to defects in the embryonic development [sprouting and regression] of the vascular plexus of the upper limb buds. This may be due to arrest at any stage of development of vessels followed by regression, retention or reappearance, thus leading to variations in the arterial origins and course of the major upper limb vessels. [11] Arey is of view that the anomalous blood vessels may be due to [i] the choice of unusual paths in the primitive vascular plexus, [ii] the persistence of vessels normally obliterated, [iii] the disappearance of vessels normally retained, [iv] incomplete

development and [v] fusion and absorption of parts usually distinct. [12]

The radial artery was introduced by Carpentier in 1971 as a coronary artery bypass conduit. [13]

In reconstructive surgery of upper limb radial artery can be ligated or cut considering it as a vein leading to disorder in circulation of hand, as stated by Nakatani. [14]

As mentioned by Campeau L and Kiemeneij et al, both femoral artery and radial artery approaches are currently regarded as the usual sites of vascular access for coronary angiography or angioplasty. [15,16] As compared with femoral artery, the major advantage of the transradial route include fewer vascular complications and earlier ambulation post procedure, as observed by Yang YJ et al. [17,18]

Campta highlighted the diagnostic, interventional & surgical significance of such a variation. Diagnostically, it may disturb the evaluation of angiographic images. Interventionally, accidental puncture of superficially placed arteries may occur while attempting venepuncture. Surgically, it is vulnerable in both orthopaedic and plastic surgery operations. [19]

Procedural time and fluoroscopy time were significantly longer in the patients with anatomic variations in transradial coronary angiography as observed by Valsecchi and Yoo. [20,21]

Such high origin and superficial course of the radial artery as reported in this case may be hazardous and vulnerable to injury during venepuncture as it can be mistaken for a vein and accidental injection of certain drugs in this artery may cause reflex vascular occlusion resulting in disastrous gangrene of hand. On the other hand, its superficial course makes arterial grafting and cardiac catheterization easier.

Accurate information regarding these variations is important for correct diagnosis

and for reconstructive surgery. Further it is important for evaluation of angiographic images.

## REFERENCES

1. Keen JA. 1961. A study of arterial variations in the limbs with special references to symmetry of vascular patterns. *Amer J Anat*; 108:245-61
2. Baeza RA, Nebot J, Ferreira B et al. 1995. An anatomical study and ontogenic explanation of 23 cases with variations in the main pattern of the human brachio-antebrachial arteries. *J Anat*; 187: 473-479
3. Gray H. 2008. *Gray's Anatomy*, 40<sup>th</sup> edi, Churchill Livingstone.pp 817
4. Deligonul U, Gabliani G, Kern MJ et al. 1989. Percutaneous brachial catheterization the hidden hazard of high brachial artery bifurcation. *Catheterization & Cardiovascular diagnosis*; 14: 44-45
5. Uglietta J. P. , Kadir S. 1989. Arteriographic study of variant arterial anatomy of the upper extremities. *Cardiovasc Interv Radiol*; 1:145-148
6. Karlsson S. and Niechajev I.A. 1982. Arterial anatomy of the upper extremity. *Acta Radiological Diagnosis*; 23: 115-121
7. Yang HJ, Gill YC, Jung WS et al.2008. Variation of the superficial brachial artery in Korean cadavers *J. Korean Med Sci*; 23:884-887
8. Syed Rehan Daini, Abu Ubaida Siddiqui, Rajendra Namdeo Wabale .2010. Variations in the branching pattern of axillary artery with high origin of radial artery. *IJAV*; 3:76- 77
9. JE Waghmare, AM Tarnekar, BR Sonatakke.2009. A high origin of radial artery with assymetrical vasculature of upper limbs; a case report. *Nepal Med coll J* ;11[4]:284-286
10. Patnaik V.V.G, Kalsey G., Singla et al.2001b Bifurcation of axillary artery in its 3rd part-a case report. *Journal of ASI*; vol. 50, no. 2:166-169

11. Hamilton WJ, Mossman HW. Cardiovascular system.1972. In Human Embryology, 4th Ed Baltimore: Williams & Wilkins;pp 271-290
12. Arey L.B. 1957. Developmental Anatomy In: Development of the arteries; 6th Edn. W.B. Saunders' co. Philadelphia,pp 375-77
13. Carpentier A, Guermonprez JL, Deloche A et al. 1973.The aorta-to-coronary artery bypass graft. A technique avoiding pathological changes in grafts. An Thorac Surg; 16: 121
14. Nakatani T, Tanaka S, Mizukami S.1991. Superficial ulnar artery originating from the brachial artery and its clinical importance. J Surg Radiol Anat;20:383-5[1991]
15. Campeau L. 1989. Percutaneous radial artery approach for coronary angiography. Cathet Cardiovasc Diagn;16:3-7
16. Kiemeneij F, Larman GJ. 1993.Percutaneous radial artery approach for coronary stent implantation. Cathet Cardiovasc Diagn ;30:173-178
17. Yang YJ, Xu B, Chen JL, Kang S et al.2007. Comparison of immediate & follow up results between transradial & transfemoral approach for percutaneous coronary intervention in true bifurcational lesions. Chin Med J; 120: 539-544
18. Kiemeneij F, Laarman GJ, Odekerken D et al.1997.A randomized comparison of percutaneous transluminal coronary angioplasty by the radial, brachial & femoral approaches: the access study.J Am Coll Cardiol; 29:1269-1275
19. Campta XG.1991. Origin of radial artery from the axillary artery & associated hand vascular anomalies. J Hand Surg; 16[A]: 293-6
20. Valsecchi O, Vassileva A, Musumeci G et al.2006. Failure of transradial approach during coronary interventions: anatomic considerations. Cathet Cardiovasc Intervent ;67:870-878 [2006]
21. Yoo BS, Yoon J, Ko JY et al.2005. Anatomic consideration of the radial artery for transradial coronary procedures: arterial diameter, branching anomaly and vessel tortuosity. Int J Cardiol;101:421-427.

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