

Variations of Origin of Radial Artery

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Abstract:

Introduction: Radial artery is the smaller terminal branch of brachial artery arising in the cubital fossa, at the level of the neck of radius. This artery is commonly used to do coronary artery angiography, cannulation.**Aim:** To study variations in the origin of radial artery. Various variations in the origin of radial artery were reported earlier, high origin of radial artery and radial artery arising from the axillary artery observed during regular dissections.**Material and Methods:** Fifty cadavers which includes both male and female were taken embalmed, the cadavers fixed in 10% formalin were dissected.**Results:** In the present study conducted on 100 upper limbs that means on fifty human adult cadavers each limb is considered as one specimen it is observed that the radial artery is arising from the third part of axillary artery in the axilla from the medial side in 1 upper limb, and in 6 upper limbs the radial artery arising in upper one third of the arm due to high division of the brachial artery.**Conclusion:** The variations in radial artery may lead to the failure of the transradial approach during surgical and radiological procedures. So the clinicians should have the knowledge of variations while doing any vascular, reconstructive, cardiac, orthopaedic, or radiological manipulations.**Keywords:** Radial Artery, Brachial Artery, Axillary Artery.

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Introduction

Radial artery is the one of the terminal branches of brachial artery arising in the cubital fossa at the level of the neck of the radius. [1,5] The proximal two-thirds of the radial artery courses posterior to the brachioradialis muscle, then the radial artery becomes superficial in the distal one third of the fore arm, proximal to the wrist joint it is present between the tendons of the brachioradialis and flexor carpi radialis. [6,7] It is the artery of choice for coronary artery angiography, percutaneous coronary artery intervention, cannulation, and others. Radial artery anomalies like high origin, tortuosity, and accessory branches are associated with the failure of such procedures. [8,9] The main objective of this study is to study the variation in origin and course of the radial artery in cadaver. [10]

Aim

Variations in the origin of radial artery have been reported in study of human cadavers.

Methods and Materials

Ratna *et al.*

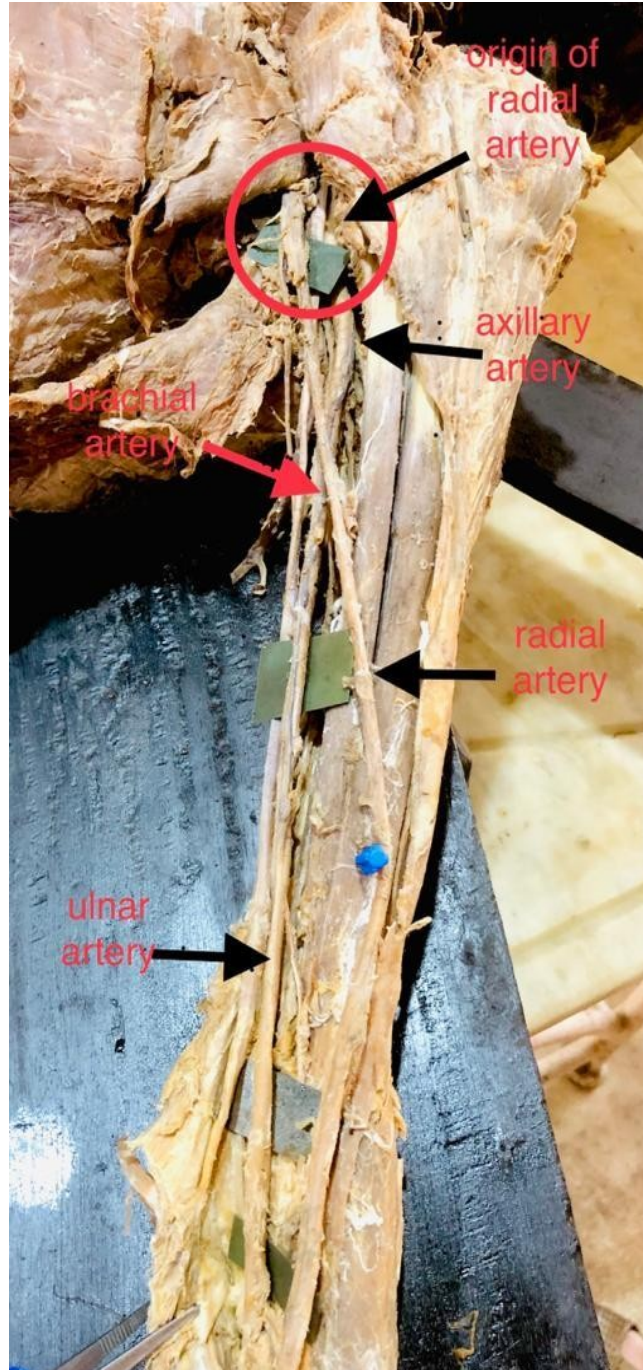
One hundred upper limbs of 50 adult human cadavers (30 males and 20 females) were used in this study. The specimens were obtained from Department of Anatomy, Andhra Medical College and Teaching Hospital, Visakhapatnam, Fifty cadavers were randomly selected. The sample consists of both male cadavers and female cadavers, fixed in 10% formalin solution were dissected. [11] The research was carried out in accordance with anatomical dissection techniques. Prior to each procedure, a thorough visual external inspection was performed to exclude specimens with deformations or traces of trauma or surgical procedures. The cadavers were placed in a supine position and their upper limbs were kept in abducted and extend at elbow and wrist joints. [12,13] The right and left upper limbs of each cadaver were dissected in the axillary region down to the hand. The skin and deep fasciae were incised and reflected to expose the deep structures. pectoralis major and pectoralis minor muscles were separated from their origins and reflected laterally to expose the axillary vessels and branches of the brachial plexus. Brachioradialis muscle was

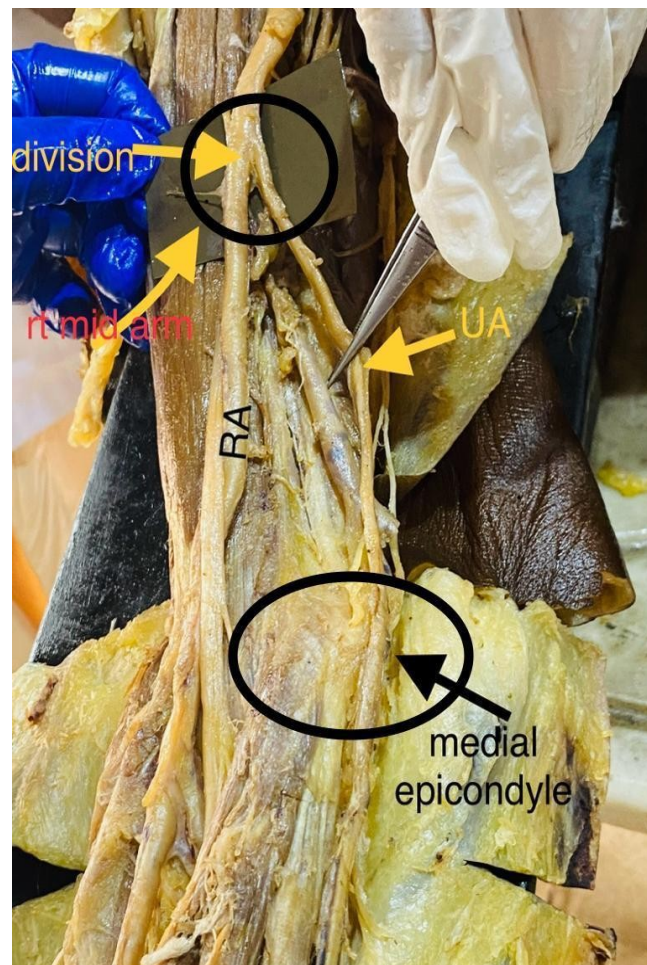
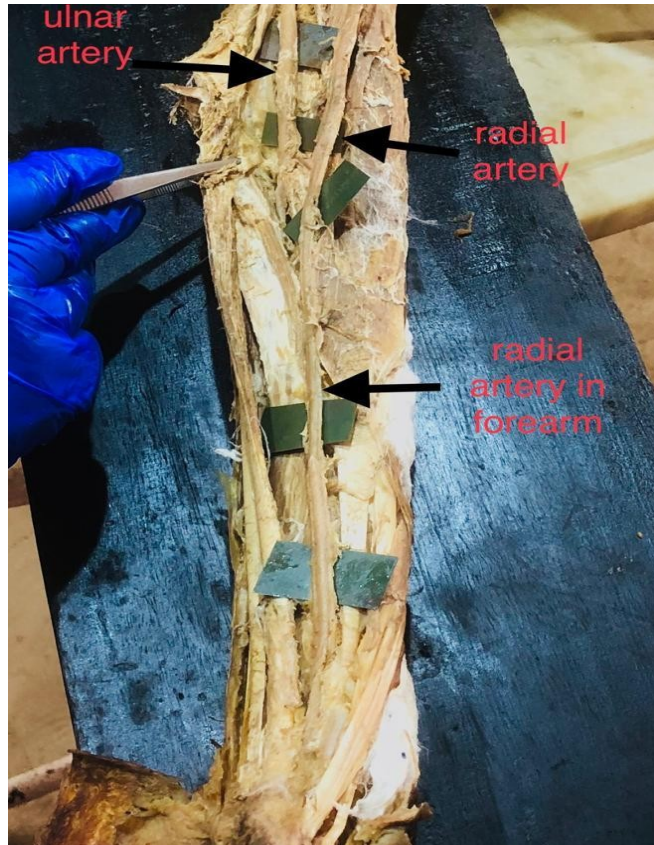
reflected laterally to expose the radial artery in the forearm. [14]

Results

In the present study conducted on 100 upper limbs that means on fifty human adult cadavers each limb

is considered as one specimen it is observed that the radial artery is arising from the third part of axillary artery in the axilla from the medial side in 1 upper limb, and in 6 upper limbs the radial artery arising in upper one third of the arm due to high division of the brachial artery.





Discussion

In the present study normal origin of the radial artery as one of the terminal branches from the brachial artery at the level of the neck of the radius is observed in 93 upper limbs. [14-17] In 6 upper limbs the high origin of the radial artery was seen in 1 upper limbs the radial artery arised from axillary artery In the literature results of the previou study shows an abnormal origin of the RA from the BA was found in 6% to 7.7% of the specimens [29]. However, lower incidence of the abnormal origin of the RA from the AA was observed in 2.3% [32], in 2.4% [34], in 2.66% [8], in 3% [1], and in 4.17% [18]. However, the abnormal high origin of RA was observed in 12.5% Similar to the results of the present study, a variant RA originating from the AA was found in 1% of the specimens [2,8]. However, a higher origin incidence of the variant RA was seen in 6%. Embryological basis. [19]

In the upper limb usually only one arterial trunk, the subclavian, persists it represent the lateral branch of the seventh intersegmental artery. Its main continuation to the upperlimb later the axial and brachial arteries passes in to the fore arm deep to the flexor muscle mass and terminates as a deep plexus. [20,21]

In the developing hand. The original axial vessel persists as anterior interosseous artery. A branch from the main trunk passes dorsally between radius and ulna as posterior interosseous artery. A second branch accompanies the median nerve in to the hand where it ends in a superficial capillary plexus. Radial and ulnar arteries are the latest arteries to appear in the forearm. Initially the radial artery arises more proximally than the ulnar artery and crosses in front of the median nerve and supplies the biceps. Latter the radial artery establishes a new connection with the main trunk at or near the origin of the ulnar artery and the upper portion of its original stem usually disappears to a large extent . The anomalies of the RA might be due to the persistence of its proximal segment with production of high origin [22]. Although knowledge of the exact factors responsible for each arterial variation is impossible, many changes may occur due to changes in the haemodynamic forces, foetal position within the uterus, genetic predisposition, chemical factors, and developmental arrest at any stage.

Conclusions

The variations in radial artery may lead to the failure of the transradial approach during surgical and radiological procedures. So the clinicians should have the knowledge of variations while doing any vascular, reconstructive, cardiac, orthopaedic, or radiological manipulations.

Knowledge of normal and variant RA distribution provide surgeons and radiologists to make proper decisions that achieve better preoperative evaluation, surgical and radiological interventions, and good postoperative result

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