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STUDY OF UNUSUAL TRIFURCATION OF BRACHIAL ARTERY IN 50 CADAVERS

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ABSTRACT

Aim to study the unusual trifurcation of brachial artery. 100 upper limbs of 50 donated embalmed cadavers (45 males & 5 females) of age group ranging from 70 to 80 years were dissected in the department of Anatomy at K. J. Somaiya Medical College, Sion, Mumbai, INDIA. The unusual trifurcation of brachial artery was observed in 2 specimens. The neuro-mascular pattern in the arm was also observed. The photographs of the unusual trifurcation of brachial artery were taken for proper documentation. The unusual trifurcation of brachial artery was observed in 2 specimens. The brachial artery trifurcated into radial, ulnar and common interosseous arteries. The knowledge of unusual trifurcation of brachial artery is clinically important for clinicians, surgeons, orthopaedicians and radiologists performing angiographic studies.

KEY WORDS: Brachial artery, Trifurcation, Radial, Ulnar and Common interosseous arteries.

INTRODUCTION

The brachial artery ends in the cubital fossa by dividing into radial and ulnar arteries. At the elbow, the ulnar artery sinks deeply into the cubital fossa and reaches the medial side of the forearm midway between elbow and wrist. The common interosseous artery is a short branch of the ulnar, passes back to the proximal border of the interosseous membrane and divides into anterior and posterior interosseous arteries. Anterior interosseous artery descends on the anterior aspect of the interosseous membrane with the median nerve's anterior interosseous branch. Median artery, a slender branch from anterior interosseous artery, accompanies and supplies the median nerve [1].

MATERIALS AND METHODS

100 upper limbs of 50 donated embalmed cadavers (45 males & 5 females) of age group ranging from 70 to 80 years were dissected in the department of Anatomy at K. J. Somaiya Medical College, Sion, Mumbai, INDIA. The unusual trifurcation of brachial artery was observed in 2 specimens. The neuro-mascular pattern in the arm was also observed. The photographs of the unusual trifurcation of brachial artery were taken for proper documentation.

OBSERVATIONS

The unusual trifurcation of brachial artery was observed in 2 specimens. The brachial artery trifurcated into radial, ulnar and common interosseous arteries.

DISCUSSION

Variant branches may arise from the brachial artery. Ulnar artery was found to deviate from its usual mode of origin in one in thirteen cases; frequently it sprang from the lower part of the brachial artery; the position of the ulnar artery in the forearm was more frequently altered; in cases of high origin, it invariably descended over the muscles arising from the medial epicondyle of the humerus and was covered by the deep fascia of the forearm. In the present study the brachial artery is terminated into radial, ulnar and common interosseous arteries. Williams et al have made a reference under variations of brachial artery, that frequently the brachial artery divides more proximally than usual into radial, ulnar and common interosseous arteries.

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But they are silent about whether these branches arise as trifurcation or separately and how much proximally these branches arise i.e. whether proximal or distal to intercondylar line. According to Huber supernumerary branches accessory to branches usually present may arise from brachial artery which may also give origin in its lower part to the radial recurrent artery and at its bifurcation to common interosseous artery or to the median artery which is usually a branch of common interosseous artery.

Embryological Basis

Primitive axis artery and superficial brachial artery are implicated in the morphogenesis of the arteries of the upper limb [3-18]. The seventh cervical intersegmental artery forms the axis artery of the upper limb and persists in the adult to form the axillary, brachial, and interosseous arteries. Transiently, the median artery arises as a branch of the interosseous artery, begins to regress and remains as a residual artery accompanying the median nerve [18]. Radial and ulnar arteries are later additions to the axis artery. An ulnar artery and a median artery are branches of the axis artery [8]. A superficial brachial artery is a consistent embryonic vessel, coexisting or not with the brachial artery [19]. It has two terminal branches, a lateral that continues as a part of the definitive radial artery [20] and a medial, superficial antebrachial artery, which divides into median and ulnar artery branches, which are the trunks of origin of the median and ulnar arteries. These trunks of deep origin predominate and the superficial arteries regress [8]. In the present study, the axis artery had formed the interosseous artery and given the trunks of the median and ulnar arteries. The ulnar branch of the superficial antebrachial artery persists independently, without its usual anastomosis to the branch of the axis artery, as the large lateral branch of the brachial artery and the superficial ulnar atery, which is found in the distal part of the forearm and joins the superficial palmar arch. If the brachial artery is taken to terminate into radial and interosseous arteries, the simpler embryological basis of the interosseous artery and the origin and course of the unusual branch of the brachial artery, replacing the ulnar artery, is the following. It appears probable that the abnormal arrangement results from early obstruction of the ulnar artery below the origin of the interosseous, and the development of a superficial vas aberrans, which replaces the portion of vessel below the obstrution and unites with the brachial.

Clinical Significance

The unusual trifurcation of brachial artery into radial, ulnar and common interosseous arteries is rare. Such trifurcation may present a hazard to venipuncture [21] and lead to intra-arterial injections or ligature instead of the vein in the cubital fossa [22,23]. The unusual trifurcation of brachial artery is of significance in cardiac catheterization for angioplasty, pedicle flaps, arterial grafting or brachial pulse.

Figure 1. Showing the photographic presentation of the unusual trifurcation of brachial artery into radial, ulnar and common interosseous arteries.

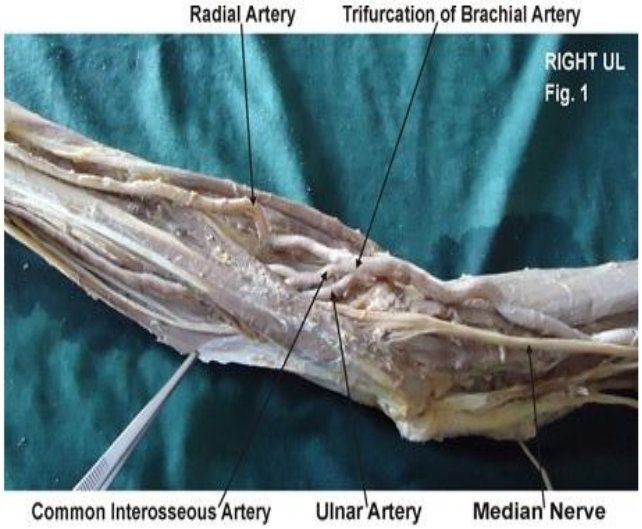
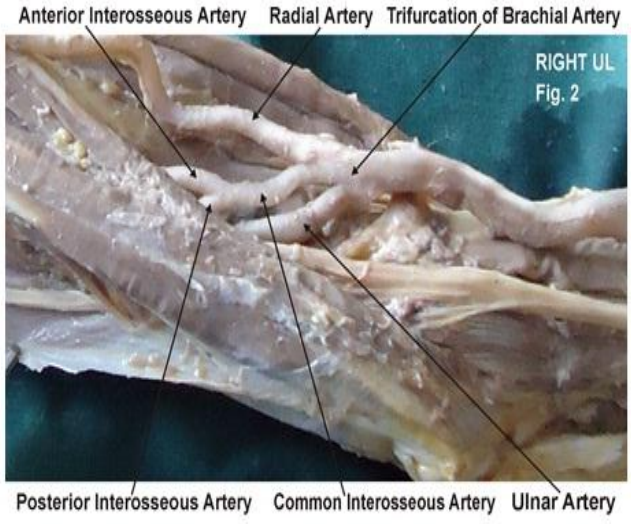


Figure 2. Showing the photographic presentation of the division of the common interosseous artery into anterior and posterior interosseous arteries.



CONCLUSION

The knowledge of presence of the unusual trifurcation of brachial artery may be clinically important for clinicians, surgeons, orthopaedicians and radiologists performing angiographic studies. Such variations are important for diagnostic evaluation and surgical management of vascular diseases and injuries.

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Competing Interests

The author declares that he has no competing interest.

Authors' contributions

SPS draft the manuscript, performed the literature review & obtained the photograph for the study.

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