



Report of a Rare Variation of the Radial Artery

Shabnam Mohammadi*, Soheyla Jafarpour

Department of Anatomy and Cell Biology, School of Medicine, Mashhad University of Medical Sciences Mashhad, Iran.

ARTICLE INFO

Article Type:
Case Report

Article History:

Received: 23 Feb 2011
Revised: 3 March 2011
Accepted: 8 March 2011
ePublished: 4 April 2011

Keywords:

Radial artery
Variation
Cadaver
Human anatomy
Upper limb

***Corresponding Author at:**

Department of Anatomy and Cell
Biology, School of Medicine,
Mashhad University of Medical
Sciences, Azadi Square, Mashhad,
Iran
Tel: +98(511) 8828560
E-mail Address:
JafarpourCHS831@mums.ac.ir
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ABSTRACT

Radial artery is used for microsurgery as well as coronary artery grafting. Operators and cardiologists may encounter by anomalies of this artery during surgery. Hence, it is important to identify these anomalies. During a routine dissection in our department, we observed a variation of radial artery on the left upper limb of an adult male cadaver. Because of the importance of the unusual patterns of the arteries for surgery and clinical procedures, we present a case of radial artery duplication in the upper limb.

1. Introduction

Radial artery is harvested for the radial forearm flap that is used for reconstructive surgery, as well as coronary artery bypass grafting. Variations of forearm arteries may be unexpectedly encountered during surgery.^{1,2} Accurate knowledge of the anatomic details of these variations is important for surgeons to prevent complications. In addition, the presence of a superficial

arterial variation may be confused with the veins and lead to intra-arterial injection of the contrast dye and this can result in necrosis of the upper limb.³ Considering important accurate information of arterial variations of the upper limb, it seems necessary to identify unusual arterial pattern of the upper limb.⁴ Hence, we report a rare radial variation for clinical consideration.

2. Case report

We found a unilateral variation of the radial artery during upper limb dissection of a 50-year-old male cadaver. The dissected specimen did not show any evidence of a previous surgery. Normal brachial artery was divided in cubital fossa into two main branches: ulnar and radial artery. Ulnar artery had normal course and distributing, while radial artery branched into a recurrent artery and a muscular artery that terminated in the flexor carpi radialis muscle (Figure 1,2). An additional radial artery, measuring 0.8 cm in diameter, originated from the axillary artery and continued to the snuff box where it ended. This accessory artery had a superficial course along lateral side of the arm and forearm that covered only by the skin and fasciae (Figure 1).



Fig 1- Photograph of the left upper limb showing course of arteries.



Fig 2- Photograph of the left upper limb showing course of brachial artery and its branches.

3. Discussion

Rodriguez-Niedenfuhr and colleagues investigated the arterial variation of the upper limb in 192 cadavers (91 males and 101 females). They reviewed unusual arterial

reports in order to unify the previous terminology.^{4, 5} Variations were named based on their location in brachial, radial, ulnar or a composition of them. Also, the term "superficial" is used for a superficial course of the artery. With regard to the classification of Rodriguez-Neidenfuhr, our specimen nearly resembles the superficial brachioradial artery. That is known as a radial artery that originated from axillary artery and coexists with a brachial artery that divided into interosseous and ulnar, or rarely into the radial and ulnar artery, and this condition have been defined as duplication of the radial artery.⁵ his case is similar to ours expect that radial artery did not continue to the wrist and terminated in muscles of lateral side of the forearm. Radial duplication was reported 0.2% by Rodriguez-Neidenfuhr,⁵ 4.3% by McCormack⁶ and 9% by Ugelitta et al.⁷ This variation was observed more frequently on the right side than the left side.^{5,7} However, in our case arterial anomaly was on the left side. McCormack et al found radial duplication in 6 dissected specimens in 750 cadavers.⁶ Other variant pattern of the upper limb include accessory brachial artery, brachioulnoradial artery, brachioulnar artery, brachiomedian artery, superficial median artery and absent of radial or ulnar artery.^{5,8,9} Different theories have explained the embryologic origins of the vascular variations in the upper limb. Rodriguez-Neidenfuhr stated that arterial system in the upper limb develops from a capillary network that originates from the dorsal aorta.⁵ In another accepted theory, Singer suggested the limb arteries arise from a main axial artery and branches arise through axial sprouting. It seems that the persistence or elimination of parts of these arteries is responsible for numerous vascular variations of the upper limb.¹⁰ In conclusion, information of variations of the radial artery is critical in prevention of accidental injection during trans-radial catheterization. It shows the importance of performing angiography or Doppler before surgery. Besides, surgeons must consider the anomalies of arteries during harvesting of the radial forearm flap.

Ethical issues

The study was approved by the Ethical Committee of the University.

Conflict of interests

No conflict of interest to be declared.

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