

Abnormal Branching Pattern of the Axillary Artery

Fereydoon Sargolzaei-Aval,*¹ Mohammad Reza Arab¹

1. Department of Anatomy, Zahedan University of Medical Sciences, Zahedan, Iran

Article information	Abstract
<p>Article history: Received: 12 Mar 2012 Accepted: 19 June 2012 Available online: 9 Jan 2013 ZJRMS 2013; 15(9): 90-92</p> <p>Keywords: Upper extremity Axillary artery Variation</p>	<p>Accurate knowledge of the normal and variant arterial pattern of the upper extremities is important for reparative surgeons. During dissection of a male cadaver, a common trunk taking origin from the third part of the axillary artery was observed. This common trunk at first gave rise to the usual branches of this part of the artery and then descended into the arm. In the arm, it gave rise to the main branches of the brachial artery and then continued as the inferior ulnar collateral artery. In this specimen, a rare pattern of auxiliary artery branching was observed. Numerous alternatives that exist during the formation of upper limb vessels seem to be responsible for anomalous arterial branching patterns.</p> <p>Copyright © 2013 Zahedan University of Medical Sciences. All rights reserved.</p>

Introduction

Variations are proved to be in the origins and branches of upper extremity arteries and their prevalence in normal people is reported to be between 11-24% [1]. Naming such variations is performed according to the position of these branches in the limb and/or their positions relative to the rest of parts in that particular area [2]. Meanwhile, variations in branching pattern of axillary artery are the most prevalent of all. Branches of this artery may be completely originated from a common trunk and/or one of its known branches [3]. Regarding the source of these branches, De Garis and Swartley reported 23 various branching patterns of auxiliary artery [4].

Cavdar et al. reported a rare variation in auxiliary artery in which the second part of the axillary was divided into two arterial trunks and were termed as medial and lateral trunks with respect to their position relative to the median nerve [5]. Being informed of the high prevalence of upper extremity arteries variations and knowing the different types of these variations are of paramount clinical importance for reparative surgeons and performing angiography.

Case Report

During the dissection of the left axillary fossa of a male cadaver, a rare unilateral variation was observed in branching pattern of axillary artery trunks. All the branches of this artery were accurately examined and traced from their detaching points to the end of their extensions and necessary images were taken. While performing the dissection, it was observed that the extension and distribution of branches in the first and second parts of the axillary artery were normal; however, the third part of the artery was divided into two arterial trunks with almost similar diameters. One of the two arterial trunks had a superficial and inward position with

respect to the median nerve and another trunk, while passing through two median nerve roots, was located in its depth, in an outward position relative to the median nerve.

The interior arterial trunk, which is called “superficial brachial artery” in articles [2], passes through the entire length of the arm and is divided into radial and ulnar arteries after entering cubital fossa. The second artery trunk, which is called “deep brachial artery” [5] in articles, is about 3 centimeters long. After passing through two median nerve roots, it extends downward and outward, and subscapular, anterior circumflex humeral and posterior circumflex humeral arteries are separated from it. Then, being outward relative to the median nerve and reduced in diameter, it entered brachial area. In brachial area, after detaching profunda brachii, it continues descending and along its path, superior ulnar collateral arteries feeding brachial bone and several other muscular branches are branched off from it. Finally, it leads to an inferior ulnar collateral artery (Fig. 1).

Discussion

The studies conducted so far show that variations in the origins of the main arteries of upper extremities in human are highly prevalent [1]. Meanwhile; variations in the number and origin of branching of axillary arteries and/or division of this artery into two arteries including superficial brachial artery and deep brachial artery were reported in some sources [5-7].

The present paper presented a rare variation in branching pattern of the axillary artery, which differs from any studies reported so far on the branching pattern of this artery. Abnormal deviation from the normal growth pattern of the vascular network of the embryo at the developmental stages causes various variations in branching pattern of the arteries of upper extremities [6].



Figure. 1: Dissection of left axillary fossa

Axillary Artery (A A.), Axillary Vein (A V.), Coracobrachialis Muscle (CB M.), Musculo-Cutaneous Nerve (MC N.) Lateral Root of the Median Nerve (M N.LR), Deep Brachial Artery (DB A.), Subscapular Artery (SS A.), Superficial Brachial Artery (S B A.) and Median Nerve (M N.) on the left margin of the image and Anterior Circumflex Humeral Artery (ACH A.), Posterior Circumflex Humeral Artery (PCH A.), Radial Nerve (R N), Profunda Brachii Artery (PB A.), Superior Ulnar Collateral Artery (SUC A.) and Ulnar Nerve (U N.) are shown on the right margin of the image.

Naturally, for an 11 mm embryo, the external branch of the seventh cervical intersegmental artery, after entering the developing limb bud, dominates and creates the central artery of upper extremities [7]. On the other hand and according to the theory of Juris et al., if an external branch of an cervical intersegmental artery remains in addition to the external branch of the seventh cervical intersegmental artery, and participates in the development of the arterial network of upper extremities under development, this extra arterial branch causes more central arteries in upper extremities [8]. According to these studies, variations of upper extremities vessels can be explained by the remaining of each of these embryonic vessels.

Today, the importance of the variety and type of the variations in upper extremities vessels has been verified; therefore, to be aware of the high prevalence and

positions of these variations and true knowledge of their different types, especially in the axillary region are of special clinical importance.

Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

Conflict of Interest

The authors declare no conflict of interest.

Funding/Support

Zahedan University of Medical Sciences.

*Corresponding author at:

Department of Anatomy, Zahedan University of Medical Sciences, Zahedan, Iran.

E-mail: fsargolzaei@yahoo.com

References

- Durgan B, Yucel AH, Kizilkanat ED and Dere F. Multiple arterial variation of the human upper limb. *Surg Radiol Anat* 2002; 24(2): 125-128.
- Kazuya Y, Kodo K, Katsuharu K, et al. Rare variation of the arm artery: Coexistence with the superficial brachial and superficial subscapular arteries in the absence of the normal brachial artery. *Okajimas Folia Anat Jpn* 2003; 80(1): 23-28.
- Yacin B, Kocabiyik N, Yazar F, et al. Arterial variation of the upper extremities. *Anat Sci Int* 2006; 81(1): 62-64.
- De Garis CF, Swartley WB. The axillary artery in white and negro stocks. *Am J Anat* 1928; 41(2): 353-97.
- Cavdar S, Zeybek A, Bayramicli M. Rare variation of the axillary artery. *Clin Anat* 2000; 13(1): 66-68.

6. Jae-Ho L, In-Jang Ch, Dae-Kwang K. Variation in the division of the axillary artery: A case report. Korean J Anat 2009; 42(1): 69-71.
7. Jayakumari S, Rath G, Arora J. Unilateral double axillary and double brachial arteries. Embryological basis and clinical implications. Int J Morphol 2006; 24(3): 463-468.
8. Jurjus AR, Correa-De-Aruaujo R, Bohn RC. Bilateral double axillary artery: Embryological basis and clinical implications. Clin Anat 1999; 12(2): 135-40.

Archive of SID

Please cite this article as: Sargolzaei-Aval F, Arab MR. Abnormal branching pattern of the axillary artery. Zahedan J Res Med Sci (ZJRMS) 2013; 15(9): 90-92.