



Anatomical Variations of the Axillary Artery Branches

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Abstract

Introduction: axillary artery begins from the lateral border of the first rib and continues to the lateral border of teres major muscle. Axillary artery usually has six branches that arising from the artery three parts. In current study the variations of the second part branches of the axillary artery have been reported.

Presentation of case: In the first male cadaver an additional branch arising from the right second part which has penetrated into the deep fascia of the axillary region. This artery has about 6 to 7 cm long and ended without branching in the deep fascia of the axillary region. Also On the left side, a muscular branch was isolated from the third part that penetrated into the serratus anterior muscle. In second male cadaver there is a variation in the branches of the artery third part in both sides. In the right side the posterior humeral circumflex and lateral thoracic were arising from the subscapular trunk, but in the left side, the lateral thoracic artery arising from the axillary third part.

Discussion: some variations have been reported in branching of second and third parts of axillary artery. Between them the origin of thoracoacromial and subscapular is more common.

Conclusion: Variations reports will definitely help surgeons to select the appropriate approach in surgeries of this area. this report was providing information about the unusual branching pattern of the axillary artery to reduce the possible injuries during axillary region surgery.

Introduction

The axillary artery is the continuation of the subclavian artery that begin from the lateral border of the first rib and continues to the lower border of teres major muscle that rename to the brachial artery. The artery passes behind The pectoralis minor muscle and divides into three parts: the first part before the muscle, the second part behind the muscle and the third part after the muscle that continues to the lower border of the teres major muscle. It gives six branches along its path: upper thoracic artery arising from the first part, thoracoacromial and lateral thoracic arteries arising from the second part, and anterior and posterior brachial circumflex arteries and subscapular artery arising from the third part [1]. Axillary artery provides blood supply to the soft tissue of

the pectoral region and chest wall also supply the shoulder joint and armpit lymph nodes. The size of the lateral thoracic artery in women is larger due to the breast supply and it anastomoses with branches of the internal thoracic artery [2,3]. Arterial variations in the upper limb is due to the differences embryonic angiogenesis of the upper limb buds, which seems to be due to the stop at any stage of the development of the vascular network and indicates regression, retention or reappearance or It is angiogenesis that can cause variation in arterial origin, variation in branches and even the path taken by the vessels [4]. The axillary artery usually has six branches, but in some cases two or more branches are created together instead of coming out of a common trunk, and it may have

5-11 branches [4,5]. Variation in the branches of the axillary first part was not common [6] But many variations have been reported in the second and third parts [3].

The most common variation are about the origin of the thoracoacromial and subscapular arteries [2]. So far, there have been several reports of variations in the branching of the axillary artery, for example origination of three arterial branches instead of two branches from the second part, or arising of the superior thoracic artery from the second part [5] in other report thoracoacromial and lateral thoracic arteries have the common trunk that arise from the posterior surface of the second part [7] also in another study, an unusual trunk was isolated from the second part, which was divided into lateral thoracic, subscapular, and muscular branches, and from the subscapular, thoracodorsal and posterior circumflex humeral branches branched off, and the only anterior circumflex humeral artery It was a branch of the third part [8]. In other case it has been found that the third part of the axillary artery is divided into two superficial and deep brachial arteries, which continue as the radial and ulnar arteries [6] or it is divided into the brachial artery and the accessory brachial artery at the end [3,9]. Knowing the anatomy of the axillary artery and its variations is essential for diagnostic purposes and therapeutic interventions, especially

in orthopedic, cardiovascular and plastic surgeries [1,9] It is also important in the surgeries of the under arm and breast lymph nodes, including radical mastectomy [2,4,10]. The current report describes the two variations observed in the second part of the axillary artery, which were observed during the dissection of two male cadavers with approximate 60–65-year-old in the dissection hall of Kerman University of Medical Sciences.

Materials and Methods

in the dissection of the right axillary region in a male cadaver, after separating the fascia and separating and naming the dissected branches that from the junction of the second and third part of the axillary artery, immediately adjacent to the lower edge of the pectoralis minor muscle, after the branching of the thoracoacromial and lateral thoracic arteries, an additional branch is separated after it, which is determined by examining the path of this artery became which has penetrated deep into the fascia of the axillary region. This artery was about 6 to 7 cm long and ended without branching in the fascia of the area. On the left side, after the lateral thoracic artery and before the anterior and posterior humeral circumflex arteries, a muscular branch was isolated, which penetrated deep into the fibers of the serratus anterior muscle (Figure 1).

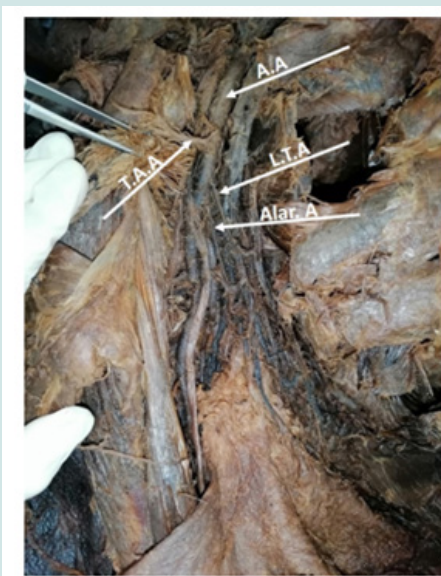


Figure 1: In situ appearance of the variation of the branching of the right axillary artery. A.A: axillary artery/ T.A.A: thoracoacromial artery/ L.T.A: lateral thoracic artery/ Alar A: Alar artery.

In situ appearance of the variation of the branching of the right axillary artery. A.A: axillary artery/ T.A.A: thoracoacromial artery/ L.T.A: lateral thoracic artery/ Alar A: Alar artery. Also, in another male corpse, after dissection and examination of the branched branches of the axillary artery, it was observed that there is a variation in the third part of the artery in both the right and left axillary arteries. With further investigation and search, it was found that in the right axillary artery, in addition to the scapular circumflex and

dorsal thoracic arteries, the posterior humeral and lateral thoracic circumflex were also separated from the subscapular trunk, and in the left axillary artery, the lateral thoracic artery instead of Second, it is separated independently from the third part of the axillary artery and from the subscapular trunk Also, an additional muscular branch was branched, which seemed to go to the subscapularis and latissimus dorsi muscles. The anterior and posterior branches of the humeral circumflex are separated from the third part of

the axillary artery in the anatomical location (Figure 2). In situ appearance of the variation of the branching of the right axillary artery. S.S.A: subscapular artery/ L.T.A: lateral thoracic artery/

T.D.A: thoracodorsal artery/ C.S.A: circumflex scapular artery/ P.C.H.A: posterior circumflex humeral artery

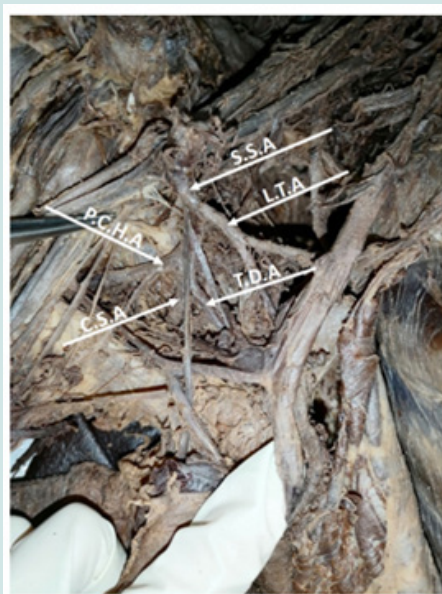


Figure 2: In situ appearance of the variation of the branching of the right axillary artery. S.S.A: subscapular artery/ L.T.A: lateral thoracic artery/ T.D.A: thoracodorsal artery/ C.S.A: circumflex scapular artery/ P.C.H.A: posterior circumflex humeral artery.

Discussion

Several studies have investigated vascular variations [11]. The branching pattern of axillary artery branches was studied according to its three anatomical branches (anterior, posterior and subscapular) according to the changes in their origin and the existence of variations in its branches. In this study, we observed bilateral changes in the branching pattern from the third part of the axillary artery, as well as variation in the branching pattern in the second part of the axillary artery. As mentioned, there have been many observations of variations in the branching branches of the axillary artery, the branching of three arterial branches instead of two branches from the second axillary part, the presence of three branches from the second part, which named the additional branch as the alar artery. Sometimes the alar artery along with lateral thoracic and subscapular branches are separated from a common trunk from the second part of the artery [4,9,10]. Alashkham et al. in their study on the variation of the axillary branches third part on 95 samples reported that in 52 samples (54.7%) there is variation on the right side and in 43 samples (45.3%) on the left side, and these changes It has been more in women than in men [1]. Lucas et al. reported that in 62.67% of cases, the lateral thoracic artery was separated from the thoracoacromial trunk [2]. Pandey et al. reported the variation of left and right lateral thoracic artery as 21.3 and 9.9%, respectively [12]. Arising of the anterior and posterior humeral circumflex, profunda brachial and superior ulnar collateral arteries from a common trunk [7] common trunk for the subscapular artery and posterior humeral circumflex, and the origin of the subscapular, anterior and posterior humeral

circumflex and profunda brachial arteries from one A common trunk has also been reported [1]. The alar artery, which has been mentioned in some cases, seems to supply blood to the adipose tissue, axillary lymph nodes, and the skin of the axillary region [10]. The large number of these variations can be important for surgeons who perform muscle flaps and pectoralis major grafts. Also, in cases where vascular bypass needs to be done in the axilla region or even in the arm region, the existence of an unknown variation can be dangerous and harmful and increases the risk of unexpected bleeding, which affects the final result of the surgery [13,14]. Knowing the variation in the branching pattern of the axillary artery is important for diagnostic purposes and therapeutic interventions, and it is also important in angiography of the chest and axillary vessels [1]. These variations, which are increasing over time and by examining the dissected bodies, will definitely help surgeons who perform various surgeries in this area. The purpose of this report was to provide information about the unusual branching pattern of the axillary artery to help reduce possible injuries during axillary surgery [7].

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Conflict of Interest

The authors declare that they have no conflict of interest.

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