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Image Article

UNILATERAL VARIATION IN THE BRANCHING PATTERN OF AXILLARY ARTERY: A CADAVERIC STUDY

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ABSTRACT

During routine dissection of upper extremity in a 55-year-old male cadaver we noted a rare variation in the branching pattern of the axillary artery on the left side. The second part of the axillary artery was the source of all the branches of the axillary artery which arise normally from second and third part. The third part of axillary artery was related to the branches of brachial plexus and without giving any branches continued as brachial artery at the lower border of teres major. This finding has an embryological basis and clinical relevance. These variations in the branching pattern of axillary artery may be due to deviation in the development of the vascular plexus of the limb bud. Awareness of variation of axillary artery may serve as a guide for both radiologists and vascular surgeons. During surgeries for lymph nodes in the axilla and pectoral region, presence of such variations must be kept in mind.

KEYWORDS: Axillary artery; Collateral branch; Accessory subscapular artery.

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INTRODUCTION

Variation in the origin, branching and course of the axillary artery has long received the attention of anatomist, surgeons, and particularly vascular surgeons. Classically, the axillary artery extends from the outer border of first rib to the lower border of teres major. Pectoralis minor crosses it and divides it into three parts- first parts is proximal, second part is posterior and third part is distal to it. The first part of axillary artery has one branch, the superior thoracic artery which runs anteromedially above the medial border of pectoralis minor and supplies thoracic wall. The second part of axillary artery has two branches, thoracoacromial and lateral thoracic artery. The thoracoacromial artery is a short branch which skirts the medial border of pectoralis minor and divides into four branches- pectoral, deltoid, acromial and clavicular. The lateral thoracic artery runs along the lateral border of pectoralis minor and supplies the thoracic wall. The third part of axillary artery has three branches, anterior circumflex humeral, posterior circumflex humeral and subscapular artery. The subscapular artery is the largest one which runs along the lateral border of scapula and and approximately 4cm from its origin it divides into circumflex scapular and thoracodorsal arteries. The anterior and posterior circumflex scapular arteries surround the surgical neck of humerus [1].

The review of literature shows many variations, in which two or more branches arising from the common trunk are reported. However, all the branches of axillary artery except superior thoracic arising from a separate collateral branch is not reported adequately except for few cases. A case has been reported showing a common subscapular trunk, giving origin to circumflex

scapular, thoracodorsal, anterior and posterior circumflex humeral, profunda brachii and ulnar collateral arteries [2]. In another report the third part of the axillary artery gave a common arterial trunk, which further gave anterior and posterior circumflex humeral, subscapular, radial collateral, middle collateral and superior ulnar collateral arteries with absence of profunda brachii artery [3]. The right axillary artery, gave a large collateral branch which is the source of several important arteries as the subscapular artery, the anterior and posterior circumflex humeral arteries, the profunda brachii and the ulnar collateral artery [4]. In the present study, the second part of left axillary artery gave thoracoacromial artery, collateral branch and subscapular artery and the third part of axillary artery had no branches. The collateral branch was the source of all other branches of second and third part of axillary artery. The present variation seems not yet reported. A thorough knowledge of vasculature of axilla is of clinical importance as it is the frequent site of growth, trauma and abscess requiring surgical interventions. Axillary lymph node dissection is an important part of many cancer operations, particularly involving breast [5]. Moreover iatrogenic axillary injuries have risen with increasing use of trans axillary catheterization by cardiologists [6]. Thus awareness of the presence of anomalies affords a better therapeutic approach to arterial injuries.

The variation in the branching pattern of axillary artery can likely be explained on the basis of deviation from the regular embryologic development of the vascular plexus of the limb bud. The lateral branch of the seventh cervical intersegmental artery becomes enlarged to form axial artery of the upper limb. The anomalous blood vessels of the upper limb may result from either unusual path in the primitive vascular plexus or persistence of vessels that usually obliterated or disappearance of vessel normally retained [7].

CASE REPORT

During routine dissection of upper limb in a 55-year-old male cadaver, it was noted that on the left side, the second and third part of axillary artery had a variation in the course, relations and branching pattern. The first part of axillary artery on the left side and the axillary artery on the right limb showed normal course and branching pattern.

On the Left side, the second part of the axillary artery was posterior to pectoralis minor and gave three branches – thoracoacromial artery, a collateral branch and subscapular artery. The thoracoacromial artery followed its usual course.

The collateral branch was related medial to the axillary artery and in the middle of its course it gave rise to the lateral thoracic artery. At the level of the formation of the median nerve,

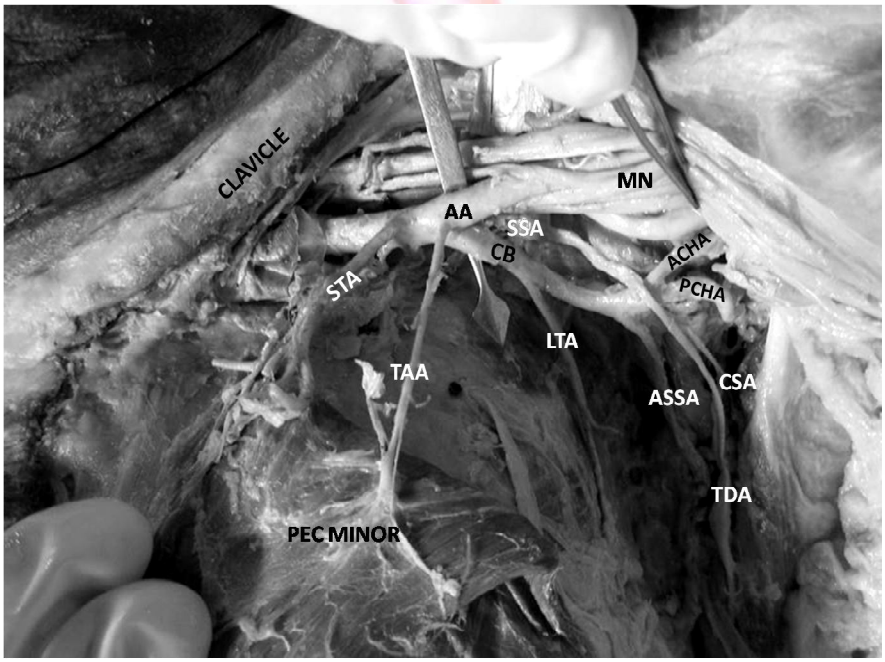

Fig.1: Dissected showing the front of chest and axilla after removal of Pectoralis minor. Axillary artery (AA), Median nerve (MN) Superior thoracic artery (STA), Thoracoacromial artery (TAA), Collateral branch (CB), Lateral thoracic artery (LTA), Anterior circumflex humeral artery (ACHA), Posterior circumflex humeral artery (PCHA), Accessory subscapular artery (ASSA), subscapular artery (SSA), Circumflex scapular artery (CSA), Thoracodorsal Artery (TDA).

it terminated into three branches - anterior circumflex humeral, posterior circumflex humeral, accessory subscapular artery. Anterior circumflex humeral, posterior circumflex humeral artery encircled surgical neck of humerus. The accessory subscapular artery traversed parallel to subscapular artery and supplied the subscapular region.

The subscapular artery arose from the second part of axillary artery immediately distal to the origin of collateral branch and related superficial to its terminal branches. The subscapular artery further subdivided into circumflex scapular artery and thoracodorsal artery.

The third part of axillary artery was related to the branches of brachial plexus and continued as brachial artery at the lower border of teres major (Fig. 1).

Conflicts of Interests: **None**

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