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ANOMALOUS BRANCHING PATTERN OF THE 2ND AND 3RD PART OF AXILLARY ARTERY: A CASE REPORT
Arindom Banerjee¹, I. Anil Kumar²

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ABSTRACT: Variations in the branching pattern of the Axillary artery have almost become a rule rather than an exception. So much of literature is available on the anomalous branching patterns of the arteries of the limbs, still each and every variation should be well documented because of its immense clinical importance. With the increase in operative and invasive procedures, the implication of this study occurs in various streams especially vascular surgery, general surgery, as well as in radio-diagnosis in Doppler and contrast imaging of vessels. The present case is regarding the anomalous branching pattern observed in the Axillary artery of the right upper limb of a 50 year old male cadaver while doing routine dissection for undergraduates in the department of Anatomy. Here the lateral thoracic artery, thoraco-dorsal and circumflex scapular artery and posterior circumflex scapular artery arises from a common trunk. The remaining 3 branches of the Axillary artery were normal in origin and the artery itself followed a normal anatomical course in the upper limb as the brachial artery. The Axillary artery branching pattern was normal on the left side.

KEYWORDS: (Axillary artery), (anomalous branching pattern), (vascular surgeries).

INTRODUCTION: Axillary artery is a continuation of the subclavian artery. It begins at the outer border of the first rib, and ends nominally at the inferior border of the teres major muscle, after which it is named the brachial artery. Pectoralis minor crosses the artery superficially and so divides it into three parts which are proximal (1st part), posterior (2nd part) and distal (3rd part). The branches of the artery are superior thoracic (from the 1st part); thoraco-acromial and lateral thoracic (from 2nd part) and subscapular and anterior and posterior circumflex humeral arteries from the third part.¹

The branches of axillary artery vary considerably. In up to 30% of the cases, the subscapular artery can arise from a common trunk with the posterior circumflex humeral artery. Occasionally, the subscapular, anterior circumflex humeral, posterior circumflex humeral and profunda brachii arteries arise in common. Two or more of usual branches may arise by a common trunk any named artery like the deltoid, acromial, clavicular or pectoral branch may arise directly from axillary artery.²

Accurate knowledge of the normal and variant arterial anatomy of the axillary artery is important for clinical procedures in this region.³ With the increase in operative and invasive procedures the implication of this study occurs in various streams especially vascular surgery, general surgery, as well as in radio-diagnosis in Doppler and contrast imaging of vessels.

CASE REPORT: The present case was observed during upper extremity dissection in a 50yrs old male cadaver for undergraduate medical students in the Department of Anatomy, Konaseema Institute of Medical Sciences and Research foundation, Amalapuram. It was observed that in the right upper limb, the lateral thoracic artery, thoraco-dorsal, circumflex scapular and posterior circumflex scapular...
artery arises from a common trunk from the second part of axillary artery underneath the pectoralis minor muscle (picture 1). This common artery continues distally as the posterior circumflex humeral artery. The other 3 branches of axillary artery had a normal origin and the axillary artery itself followed a normal anatomical course in the upper limb as the brachial artery (picture 2).

The Axillary artery branching pattern was normal on the left side.

**DISCUSSION:** Variations in branching pattern of axillary artery have been routinely reported in the past. Maraspin (1971) has reported the bifurcation of the second part of the axillary artery into superficial brachial and deep brachio-thoracic branches. Compta (1991) noticed the division of third part of axillary artery into an anterior branch, which constituted the high origin of radial artery and a posterior branch which was the proper brachial artery. Patnaik (2001) reported a case of bifurcation of axillary artery in its 3rd part. In the present case the common trunk which further gives rise to the lateral thoracic, thoraco-dorsal, circumflex scapular arteries and continues as the posterior circumflex humeral artery may be considered as the deep brachial artery in accordance with the studies of the previous researchers.

However the profunda brachii and the anterior circumflex humeral arteries do not arise from the deep branch but arise from the normal axillary artery itself (picture 3). Also there is no existence of the sub-scapular artery as such. Axillary artery may give origin to a common trunk from its third part from which anterior circumflex humeral, posterior circumflex humeral, subscapular and profunda brachii arteries may arise.

Saeed et al. reported the origin of a common subscapular-circumflex humeral trunk from the third part of axillary artery, which divided into subscapular, anterior circumflex humeral and posterior circumflex humeral arteries in 3.8% of cases.

Ramesh et al. reported unusual origin of a common trunk from the third part of the left axillary artery, which gave origin to subscapular, anterior circumflex humeral, posterior circumflex humeral, profunda brachii, and ulnar collateral arteries. Therefore it is obvious that because there are so many variations in which the axillary artery branches may manifest themselves the above-mentioned research work does not matches exactly with our case study.

Variations in branching pattern of axillary artery are due to defects in embryonic development of the vascular plexus of upper limb bud. This may be due to an arrest at any stage of development of vessels followed by regression, retention or reappearance, thus leading to variations in the arterial origin and course of major upper limb vessels. Such anomalous branching pattern may represent persisting branches of the capillary plexus of the developing limb buds and their unusual course may be a cause for concern to the vascular radiologists and surgeons, and may lead to complications in surgeries involving the axilla and pectoral regions.

**CONCLUSION:** The variation described here is of great significance for vascular and cardiothoracic surgeons. Such a variant formation has to be confirmed in angiographic studies prior to coronary artery bypass grafting to avoid iatrogenic accidents. The variant anatomy is also significant during axillary dissection in breast cancer treatment. Knowledge of branching pattern of axillary artery is necessary during ante-grade cerebral perfusion in aortic surgery, while treating the axillary artery thrombosis.
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With the increase in operative and invasive procedures the implication of this study occurs in various streams especially vascular surgery, general surgery, as well as in radio-diagnosis in Doppler and contrast imaging of vessels.

Therefore, both the normal and abnormal anatomies of the axillary artery should be well known for accurate diagnostic interpretation and surgical intervention.

REFERENCES:

Picture 1: Showing the common trunk arising from the second part of axillary artery showing branches lateral thoracic artery, thoraco-dorsal artery, circumflex scapular artery branching from it and continuation of the artery as the posterior circumflex humeral artery.
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**Picture 2:** Showing the median nerve$^{(1)}$ and the axillary artery continuing downwards as the brachial artery$^{(2)}$. The common trunk arising from the second part of axillary artery can also be seen.

**Picture 3:** The anterior circumflex humeral artery$^{(2)}$ is a branch of the axillary artery$^{(1)}$ and not the common trunk.

**AUTHORS:**
1. Arindom Banerjee
2. I. Anil Kumar

**PARTICULARS OF CONTRIBUTORS:**
1. Associate Professor, Department of Anatomy, Konaseema Sciences and Research Foundation, Amalapuram.
2. Associate Professor, Department of Anatomy, Konaseema Sciences and Research Foundation, Amalapuram.

**NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:**
Dr. Arindom Banerjee,
Associate Professor,
Department of Anatomy,
KIMS & RF, College Block,
NH-214, Awalapuram-533201, A. P.
Email: arindomdoc@yahoo.co.in

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