An Unusual Branching Pattern of the Axillary Artery and Brachial Artery- A Case Report

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ABSTRACT:
Branches of the upper limb arteries have been used for coronary bypass and flaps in reconstructive surgery. Anomalies in the artery are infrequent and their descriptions have generally been centered on the anomalous origins of some of its branches. We observed an unusual branching pattern of the axillary artery and brachial artery. In axilla, first part of axillary artery did not give any branch, the second part of axillary artery gave off only two branches - (A) a common trunk which later gave off superior thoracic, clavicular, and pectoral branches and (B) a large common trunk which later gave off lateral thoracic, posterior circumflex humeral, thoracodorsal, subscapular, and then continued as circumflex scapular artery. The third part of axillary artery gave three branches- a) Acromial, b) Deltoid, and c) Anterior circumflex humeral. In the arm brachial artery gave off a common trunk which latter gave off profunda brachi, superior ulnar collateral arteries. The embryogenesis of such a combination of anomalies is not clear, but the anatomic consequences may have important clinical implications. These anomalies are described in detail and their clinical relevance is highlighted.

KEY WORDS: Axillary artery, brachial artery, profunda brachii artery.

INTRODUCTION
The course and branching pattern of the axillary artery vary with race, sex and ethnic groups [1, 2]. The axillary artery, a continuation of the subclavian artery, begins at the outer border of the first rib, and ends by becoming the brachial artery at the inferior border of teres major [3, 4, 5]. The artery is divisible into three parts by the pectoralis minor muscle as it crosses the artery...
anteriorly: First part gives superior thoracic artery, second part gives thoracoacromial artery, lateral thoracic artery and third part gives subscapular artery, anterior and posterior circumflex humeral arteries. In arm the brachial artery gives profunda brachii, superior and inferior ulnar collateral and nutrient branches. Principal arteries of the upper limb show a wide range of variations that is of considerable interest to orthopaedic surgeons, plastic surgeons, radiologists and anatomists.

CASE REPORT:

During routine dissection of (1st M.B.B.s student’s batch 2011-2012) the right upper limb of a middle aged male cadaver at Pinnamaneni Siddhartha institute of medical sciences & research foundation Gannavaram; Krishna Dist; A.P (INDIA), we found an unusual branching pattern of the axillary artery and brachial artery. The arterial pattern in left upper limb was normal.

OBSERVATION

We report a case of an unusual branching pattern of the axillary artery and brachial artery which has not been reported in the available literature yet (Fig 1 and Fig 2).

Fig 1: Variation of arterial system at axilla in right upper limb

![Variation of arterial system at axilla in right upper limb](image)

PM- Pectoralis minor.  1st, 2nd, 3rd parts of - Axillary artery  CT - Common trunk.
Pb- Pectoral branch.  LT - Lateral thoracic artery.  PH- Posterior circumflex humeral artery.  SC- Subscapular artery.
AcH- Anterior circumflex humeral artery.  Db- Deltoid branch.  BA- Brachial artery.  RN- Radial nerve.
Fig 2: Variation of arterial system at arm in right upper limb

In the axilla

In the axilla, branching pattern was abnormal. The first part of axillary artery did not give any branch. The second part of artery gave two branches- (A) a common trunk which later gave off superior thoracic, clavicular, and pectoral branches (did not give acromial and deltoid branches) and (B) a large common trunk which later gave off lateral thoracic, posterior circumflex humeral, thoracodorsal, subscapular, and then continued as circumflex scapular artery. The third part of axillary artery gave three branches- a) Acromial, b) Deltoid, and c) Anterior circumflex humeral.

In the arm

In the arm brachial artery gave off a common trunk which latter gave off profunda brachii artery accompanied by the radial nerve before both entering to radial groove, and superior ulnar collateral artery accompanied by the ulnar nerve before both piercing the medial intremuscular septum.
DISCUSSION

Accurate knowledge of the normal and variant arterial pattern of the human upper extremities is important both for reparative surgery and for angiography [6]. Branches of axillary artery vary considerably. Origin of superior thoracic artery from the thoraco-acromial artery [7]. Origin of thoraco-acromial artery from either 1st or 2nd parts of axillary artery [8, 9]. But in our case superior thoracic, thoraco-acromial artery branches clavicular and pectoral are arising as a common trunk from the second part where as acromial and deltoid branches of thoraco-acromial artery are arising from the third part of axillary artery. Occasionally subscapular artery, circumflex humeral artery and arteria profunda brachii arise in common [10]. Kumar MR Bhat et al reported a case in which axillary artery giving all of its common branches (except superior thoracic and anterior circumflex humeral) from a single trunk [11]. But in our case lateral thoracic, thoraco dorsal, posterior circumflex humeral, and circumflex scapular artery only arise in common from the second part of axillary artery. Profunda brachii, superior ulnar collateral arteries are arising as a common trunk from the brachial artery.

Embryologically the origin of anomalies in the branching pattern of upper limb arteries may be due to the:

- The persistence of vessels normally obliterated.
- Fusions and absorption of the parts usually distinct
- Incomplete development.
- Choice of unusual paths in the primitive vascular plexuses [12].

Vascular anomalies occurring in common surgical sites tend to increase the likelihood of damage during surgery. Awareness about details and topographic anatomy of variations of the axillary artery may serve as a useful guide for both surgeons and radiologists. It may help to prevent diagnostic errors, influence surgical tactics and interventional procedures and avoid complications during the surgery of the axillary region.

REFERENCES


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