



Unilateral Variation In The Branching Pattern Of Axillary Artery

KEYWORDS

Axillary Artery, Accessory axillary artery

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ABSTRACT During routine cadaveric dissection, finding a variation in the normal anatomical structures is of great interest to all the anatomists.

Here, we present a case regarding a unilateral anomalous branching pattern of the Axillary artery, found on the right side in an old male cadaver during a routine cadaveric dissection.

Conventionally, Axillary artery is described as having three parts - first, second, third - with reference to the tendon of insertion of Pectoralis minor muscle. Each part then gives off its own branches as first part one, second part two and third part three.

In the present case, the first part of Axillary artery does not give any branch. The second part is seen to divide into - a) Superficial and b) Deep branches. Both the branches are of equal diameter.

a) The superficial branch after giving Thoracoacromial Artery in second part and Anterior Circumflex Humeral Artery in third part continued in the arm as the brachial artery.

b) The deep (described by many as accessory axillary artery) branch distributed the following branches - i) Superior Thoracic Artery, ii) Lateral Thoracic Artery, iii) Accessory Thoracic Artery, iv) Subscapular Artery and v) Posterior Circumflex Humeral Artery.

Introduction

Axillary artery is the direct continuation of the subclavian artery from the outer border of the first rib. The course of the axillary artery is anatomically divided into three parts by its relation with the pectoralis minor muscle.

- The first part begins at the lateral border of the first rib and extends to the medial border of the pectoralis minor muscle.
- The second part of the axillary artery lies deep to the pectoralis minor muscle.
- The third part lies between the lateral border of the pectoralis minor muscle and the inferior border of the teres major muscle.

The axillary artery is usually described as giving off six branches.

- The first part of the artery gives superior thoracic artery.
- The second part of the artery gives lateral thoracic and thoracoacromial branches.
- The third part of the artery gives subscapular artery (further divided into thoracodorsal and circumflex scapular arteries), anterior circumflex humeral and posterior circumflex humeral arteries.

This study reports a case with a unilateral variation in the branching pattern of the axillary artery in an old male cadaver.

Observations

This work is based on a routine dissection for the 1st M.B.B.S. students, done in the Department of Anatomy, Bharati Vidyapeeth University Medical College. The dis-

section is carried out on both upper extremities of an old male cadaver.

The left axillary artery is running a normal course and giving off regular branches as described in various textbooks of anatomy.

The right axillary artery shows variation in its branching pattern. The first part of the artery on this side does not give any branch. The thoracoacromial artery arises from the second part just medial to the upper border of the Pectoralis minor muscle and gives pectoral and deltoid branches. An accessory artery then arise from the second part of the right axillary artery just inferior to the arising point of the thoracoacromial artery, named here as the accessory axillary artery.

The accessory axillary artery acts as a common trunk which then gives all the remaining branches of the axillary artery except the anterior circumflex femoral artery. It is located at a deeper level of the main axillary arterial trunk and the brachial plexus nerves.

It first gives the superior thoracic artery and then the lateral thoracic artery. It also gives an accessory thoracic artery. It runs a further course of about 2 cm and terminates into subscapular artery and posterior circumflex humeral artery. The right subscapular artery divides into the thoracodorsal artery and circumflex scapular artery which enters the triangular space. The right anterior circumflex humeral artery arises from the third part of the axillary artery.

The main axillary artery continues in the arm as the brachial artery and runs a normal course with the usual branches.

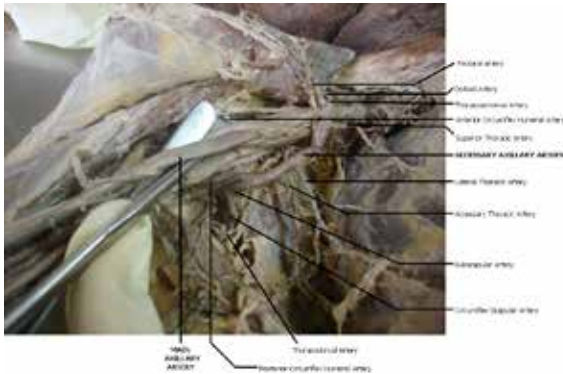


Figure 1: A dissection showing the division of the second part of right axillary artery into main and accessory trunks and the branches of the accessory axillary artery

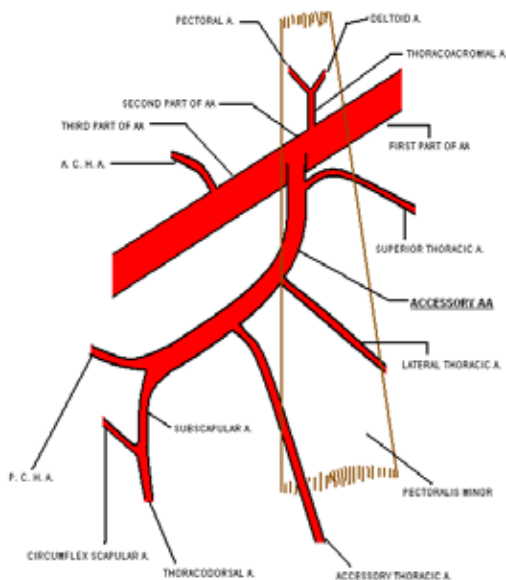


Figure 2: A schematic presentation showing the division of the second part of right Axillary artery in this case

Discussion

The axillary artery is usually described as giving off six branches, although the number varies because two or more arteries often arise together instead of separately, or two branches of an artery arise separately instead of from the usual common trunk. Thus, instead of six, there may be anywhere from 5 to 11 branches (Hollinshead & Rosse, 1985).

The arterial anomalies in the upper limb are due to defects in the embryonic development of the vascular plexus of the upper limb bud. This may be due to arrest at any stage of development, showing regression, retention or re-appearance and may lead to variations in the arterial origins and courses of the major upper limb vessels (Hamilton WJ, Mossman HW., 1972).

Sound knowledge of axillary artery variation is important for surgeons, since except for the popliteal, the axillary artery is more frequently lacerated by violence than any other artery, being more susceptible when diseased. It has been ruptured in attempt to reduce old dislocations, especially when the artery is adherent to the articular capsule

(Williams *et al.*, 1995).

Branches of the upper limb arteries have been used for coronary bypass and flaps in reconstructive surgery. Accurate knowledge of the normal and variant arterial pattern of the human upper extremities is important both for reparative surgery and for angiography (Yoshinaga *et al.*, 2006).

The importance of the axillary vessels for breast cancer surgery is in connection with the removal of lymph nodes and protection of axillary artery and vein by surgeons (Jurjus *et al.*, 1999).

Other clinical relevance of the axillary artery variation is its importance for plastic surgery. The exact pattern of axillary vasculature is crucial for the formation of myocutaneous flaps (Shipkov *et al.*, 2000).

Awareness about details and topographic anatomy of variations of the axillary artery may serve as a useful guide for both radiologists and vascular surgeons. It may help to prevent diagnostic errors, influence surgical tactics and interventional procedures and avoid complications during the surgery of the axilla region (Ramesh Rao *et al.*, 2008).

Such abnormalities may be encountered clinically although it is rare. Awareness of the presence of anomalies may decrease possible iatrogenic injuries during interventional vascular procedures.

Therefore both the normal and abnormal anatomy of the region should be well known for accurate diagnostic interpretation and therapeutic intervention.

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