

Letters to Editor

A rare variation in the branching pattern of the axillary artery

Dear Sir,

The axillary artery, a continuation of the subclavian artery begins at the outer border of the first rib, ending normally at the inferior border of the Teres major and continuing further distally as the brachial artery. The pectoralis minor muscle crosses it anteriorly and divides it into three parts, proximal, posterior and distal to the muscle.^[1] The axillary artery is conveniently described as giving off six branches but the number arising independently from it, is subject to considerable variations; two or more of its standard branches may arise by a common trunk or a usually named artery may arise separately. The commonly described branches of the axillary artery are superior thoracic artery, thoracoacromial artery, lateral thoracic artery, subscapular artery, anterior circumflex humeral artery and posterior circumflex humeral artery [Figure 1].

During the dissection classes in the Department of Anatomy at Melaka Manipal Medical College, a 50-year-old male cadaver showed unilateral variations in the branching pattern of the third part of the left axillary artery. The observations include:

1. An abnormal trunk taking origin from the third part of the axillary artery gave rise to anterior and posterior circumflex humeral, subscapular, radial collateral, middle collateral and superior ulnar collateral arteries [Figure 2].
2. Absence of profunda brachii artery

The axillary artery is anatomically divided into three parts. The first part begins at the lateral border of the first rib and extends to the medial border of the pectoralis minor. The first part is enclosed within the axillary sheath along with the axillary vein and brachial plexus. The second part of the axillary artery lies deep to the pectoralis minor. The third part lies between the lateral border of the pectoralis minor and the inferior border of the teres major. There is an extensive collateral circulation associated with the subclavian and

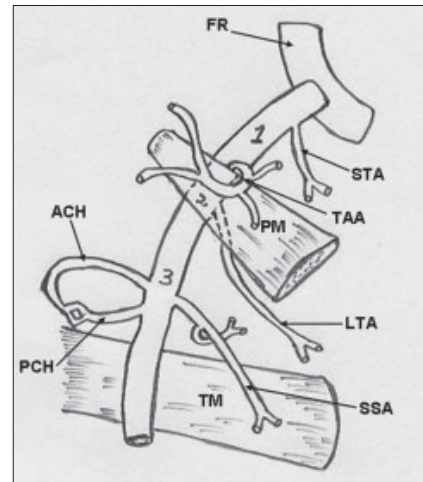


Figure 1: Schematic diagram showing normal branching of the axillary artery. 1 - first part, 2 - second part, 3 - third part, FR - first rib, STA - superior thoracic artery, TAA - thoracoacromial artery, LTA - lateral thoracic artery, SSA - subscapular artery, ACH - anterior circumflex humeral artery, PCH - posterior circumflex humeral artery, PM - pectoralis minor, TM - teres major

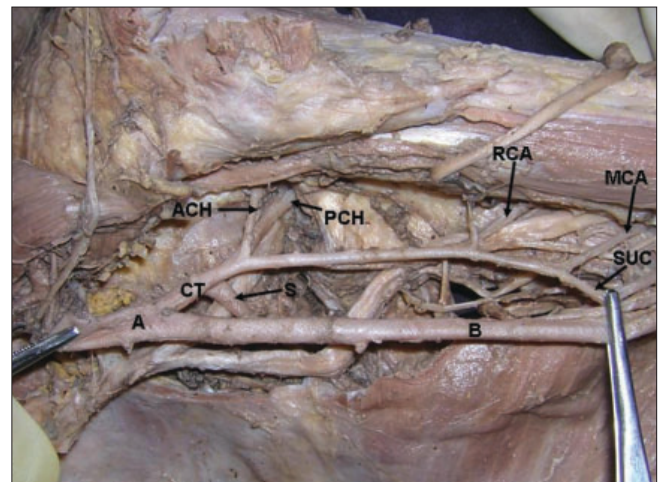


Figure 2: Anomalous branching pattern of the third part of the axillary artery. A - third part of axillary artery, CT - common trunk, S - subscapular artery, ACH - anterior circumflex humeral artery, PCH - posterior circumflex humeral artery, RCA - radial collateral artery, MCA - middle collateral artery, SUC - superior ulnar collateral artery, B - brachial artery

axillary arteries, particularly around the scapula. This clearly becomes of clinical significance during injury of the axillary artery.

Anatomic variations in the major arteries of the upper limb have been reported.^[2] These include absence of the radial artery^[3] and the presence of a superficial brachial artery^[4,5] as well as a superficial ulnar artery.^[6,7] Cases with this kind of variations should be examined or operated carefully during surgical or electrophysiological procedures.

The increasing use of invasive diagnostic and interventional procedures in cardiovascular diseases

makes it important that the type and frequency of vascular variations are well documented and understood. 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.

In the present case the course and distribution of the first and second part of the left axillary artery were normal. But there was a common trunk taking origin from the third part of the axillary artery giving rise to anterior and posterior circumflex humeral, subscapular arteries in the axilla and then descended into the arm to give radial collateral, middle collateral and continued as the superior ulnar collateral artery.

Lateral to the third part of the axillary artery were the lateral root and the trunk of the median nerve and for a short distance, the musculocutaneous nerve. Medial relations were the medial cutaneous nerve of the forearm, the ulnar nerve and the medial cutaneous nerve of the arm. The radial and axillary nerves were posterior to the artery. The medial root of the median nerve passed posterior to the artery. The common branch arose from the posterolateral aspect of the third part of the axillary artery.

The arterial pattern of this specimen was different from other reported arterial variations, because (1) subscapular, anterior and posterior circumflex humeral arteries arising from a common trunk instead of the third part of axillary artery, (2) absence of profunda brachii artery, (3) radial collateral and middle collateral arteries arising from common trunk instead of profunda brachii artery, (4) superior ulnar collateral artery taking origin from the common trunk instead of brachial artery.

Normally, the profunda brachii is a large branch from the posteromedial aspect of the brachial artery, distal to the teres major. It follows the radial nerve closely, at first posterior between the long and medial heads of the triceps, then in the spiral groove covered by the lateral head of the triceps. It supplies muscular branches, the nutrient artery of the humerus and finally divides into terminal radial and middle collateral branches.^[1] In the present case there was no profunda brachii artery, radial and middle collateral arteries took origin from the common trunk coming from the

axillary artery. The rest of the course of these branches was normal and took part in anastomoses around the elbow.

The middle collateral artery and its fasciocutaneous perforators provide the anatomical basis to allow a skin flap (the lateral arm flap) to be surgically raised (either pedicle or by free tissue transfer) for reconstructing areas of tissue missing elsewhere in the body.

Normally, in embryos of 11 mm length, the seventh cervical intersegmental artery enlarges and becomes the dominant vessel of axilla. C6, C7 and T1 segmental arteries and most of the longitudinal anastomoses that link up the intersegmental arteries degenerate slowly. The numerous alternatives that exist during the formation of upper limb vessels seem to be responsible for anomalous arterial branching patterns.^[8,9]

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