Case Report

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Unilateral double axillary and double brachial arteries, a case report

Abstract

This case represents a rare anomaly in the right upper limb, the axillary artery is doubled and each one gives rise to a brachial artery, the medial brachial artery gives rise to ulnar and radial arteries, the lateral brachial artery gives rise to the profunda brachii artery that supplies the usual structures of the arm and then continues as the common interosseous artery. This case was noticed in the right upper limb, the distribution of arteries in the left side was normal.

Keywords: axillary artery, brachial artery, bifurcation

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Introduction

The axillary artery is the continuation of the subclavian artery at the outer border of the first rib, it is divided by the pectoralis minor muscle into three parts: 1st, 2nd and 3rd. it is continuums as brachial artery when it passes the lower border of teres major muscle, it divides anterior to the cubital fossa into radial and ulnar branches, the common interosseous artery is a branch from the ulnar[1–3] and variations in the vessels of the upper limb are noted most commonly in the radial artery, followed by the ulnar artery while variations of the brachial artery are less common.[4] The proximal division of the axillary artery is one of the most variations of the axillary artery.

Materials and methods

In a routine dissection for teaching of undergraduate medical student in Alneelain University, Khartoum, Sudan, an unusual observation was found in a cadaver out of eight cadavers in the Dissection room, the arterial variation was observed in a dissected right upper limb of middle aged male cadaver preserved in formaldehyde solution. The specimen was carefully dissected, photographed and the photos were labeled.

Observation

It was possible to observe in the proximal portion of the middle third of the arm, an abnormal double brachial artery; a fine dissection was then performed and extended distally for the anterior area of the forearm and proximally to demonstrate the origin of the artery, following the same sequence of anatomical planes of arm dissection, and findings were documented.

The axillary artery was found bifurcating from its second part into two main arteries (Figure 1), each one of them continues as brachial artery, for purposes of description, we named the axillary arteries as medial (branch) and lateral (branch).

The medial axillary artery continues as brachial artery that runs medially and more superficially than the other one, it can be considered as superficial brachial artery, it lies anterior to ulnar nerve and medial to it, but crosses laterally to reach the cubital fossa, and doesn't give any branches in this region, then it reaches the cubital fossa and divides into two branches, radial and ulnar arteries but the later is smaller than the former one (Figure 2).

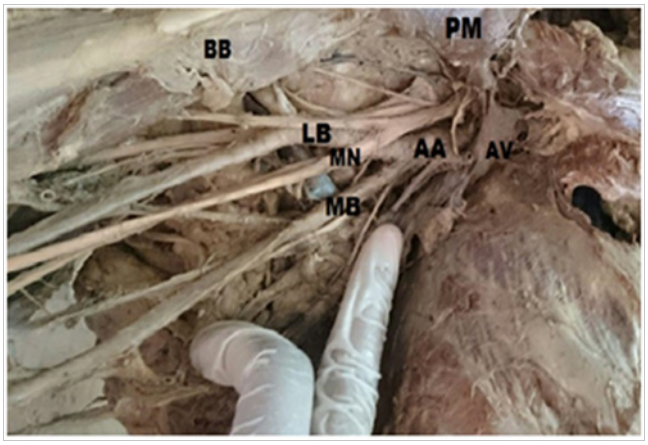

Figure 1 AA, Axillary Artery; LB, lateral branch of the axillary artery; MB, medial branch of the axillary artery; AV, axillary vein; PM, pectoralis minor (reflected); BB, biceps brachii muscle; MN, median nerve.

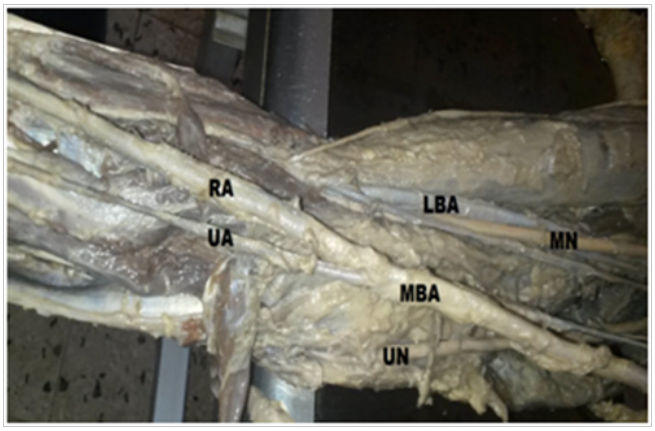

Figure 2 MN, median nerve; MBA, medial branch of axillary artery, LBA, lateral branch of axillary artery, UN, ulnar nerve, RA, radial nerve, UA, ulnar artery.

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The ulnar branch doesn't give the common interosseous artery, and it follows the usual course when it reaches the hand to form the palmar arch. The radial branch, and follows its usual course until arrives the hand posterior to the scaphoid bone to form the deep palmar arch.

The lateral axillary artery is larger than the other one, it crosses the median nerve from medial to lay lateral to it (Figure 1), after 3cm of its origin it gives off the anterior and posterior circumflex humeral arteries, it continues as brachial artery and in the middle third of the arm it gives off the profunda brachii artery from its posterior aspect, after 2cm of profunda brachii origin another artery arises which is the superior ulnar collateral while the inferior one is taking place just above the inter condylar line, then it lies in the cubital fossa lateral to the median nerve and continuous as common interosseous artery (Figure 2) as it bifurcates eventually into anterior and posterior interosseous arteries.

Discussion

Axillary arteries

A case of unilateral double axillary arteries was reported by Jayakumari S[5] in which the artery divides at its second part into two arteries in the right limb, and the continue as two brachial arteries, the superficially placed brachial artery gives rise to the ulnar, radial and common interosseous arteries, the deeply placed brachial artery gives the profunda brachii artery and eventually meets the other brachial artery, at the point of meeting the radial and common interosseous arteries branch out.

Unilateral double axillary artery is also observed by Yotova N[6] in which the artery divides in left axilla into two equal branches in diameter, one of the two arteries continues as brachial artery, and the other passes to give rise to the branches of the third part of the axillary artery and continuous as profunda brachii artery. The same findings were observed by Yohannan DG[7] with the exception that the findings were noted in the right side. Reported double axillary artery in both sides of the same cadaver, on the right side the axillary artery is terminated as profunda brachii artery, while in the right side it is terminated by muscular branches reach to the triceps muscle.[8]

In this case, the axillary artery is divided into two arteries at the second part, the lateral division is larger. They don't unite again, and unlike most of the literature we found, each one of continuous as the brachial artery up to the forearm.

Brachial arteries

Jayakumari et al.[5] reported two brachial arteries, deep and superficial, the superficial gives rise to the ulnar artery, then to the radial and common interosseous arteries when it joins the deep, the deep brachial artery gives rise to profunda brachii artery.

Krstonosic et al.[9] noted double brachial artery in the left limb, the artery divided into two arteries oriented superficial and deep, the superficial brachial artery gives rise to the radial artery while the ulnar artery emerges from the brachial artery (the deep artery).

Comparing the above to studies, the superficial brachial artery gives rise to the ulnar artery (then eventually to the radial and common interosseous) in one case and the radial artery in the other, in both the superficial and deep arteries are joined together. In the current case the superficial brachial artery gives rise to both ulnar and radial arteries, and the common interosseous artery arises from the deeply placed brachial artery.

The common interosseous artery was reported as emerging directly from the main trunk of the brachial artery at the left limb and from the redial artery in a left limb in the same cadaver.[10]

This case represents a different variation, the ulnar and radial arteries emerge from the medial brachial artery (superficially placed), common interosseous artery emerges proximally as continuation of the lateral brachial artery (deeply placed) and not from the ulnar artery, it can explain the smaller size of the ulnar artery in relation to the radial artery in this case, the lateral brachial artery itself supplies the same structures supplied by the brachial artery in the arm, including giving rise to the profunda brachii artery.

This case draws attention for the need of conducting more studies in alive patients, to detect its frequency and effect on the function of the limb.

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None.

Conflict of interest

Author declares that there is no conflict of interest.

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