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Case Report

ANOMALOUS BRANCHING PATTERN OF AXILLARY ARTERY IN RELATION TO LONG THORACIC NERVE AND ITS CLINICAL SIGNIFICANCE

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ABSTRACT: An unusual anomalous branching pattern of axillary artery was observed in the middle aged male cadaver during routine cadaveric dissection. The lateral thoracic artery was found to emerge from third part of axillary artery forming a common trunk with subscapular artery and posterior circumflex humeral on left side. It was also noted that, the long thoracic nerve was passing between the two branches of lateral thoracic artery. Such course of long thoracic nerve makes it highly vulnerable to compression and injury, which may manifest as winging scapula. Sound knowledge of such neurovascular variations is important for surgeons, anesthesiologists and orthopedic surgeons, which may prevent diagnostic errors.

Keywords: Axillary artery, lateral thoracic artery, Subscapular artery, winging scapula.

INTRODUCTION

The axillary artery is a continuation of the subclavian artery from the outer border of the first rib and ends at the inferior border of the teres major and continues in the arm as brachial artery. The pectoralis minor muscle crosses the axillary artery and divides the artery into three parts, proximal (first part), posterior (second part) and distal (third part) to the muscle. The first part gives rise to superior thoracic artery, second part to thoracoacromial artery and lateral thoracic artery and the third part to anterior circumflex humeral, posterior circumflex humeral and subscapular arteries (Williams et al, 1989). There is an extensive collateral circulation associated with the subclavian and axillary arteries, particularly around the scapula. Branches emerging from axillary artery supply the thoracic wall and the shoulder region. Sometime many of the branches originate from common stem as well (Saralaya V, 2008).

In this case we describe an unusual branching pattern of axillary artery in relation to long thoracic nerve, as per our knowledge such unusual neurovascular variations has not been reported in modern literature.

MATERIAL AND METHODS

During routine cadaveric dissection in department of anatomy, we noted an unusual branching pattern of axillary artery in relation to the long thoracic nerve in a middle aged male cadaver. Pectoral region, axilla and brachial plexus were taken utmost care. Axillary artery and its branches were exposed, and appropriate photographs were taken for proper documentation.

OBSERVATION

During routine dissection of upper limb in a middle aged male cadaver, we noted the following unusual branching in the third part of axillary artery on left side [Fig 1].

- Out of two branches that should have originated from second part, only thoracoacromial artery was seen emerging. The lateral thoracic artery was found missing from the second part of axillary artery and when searched, was found to be originating from a common trunk with posterior circumflex humeral artery & subscapular artery.
- After a course of about 3 cm, the lateral thoracic artery was found to be dividing into two branches and the lateral thoracic nerve was noted passing in between these two branches of the artery [Fig 2]. Such type of course may compress the nerve and cause winging of scapula.

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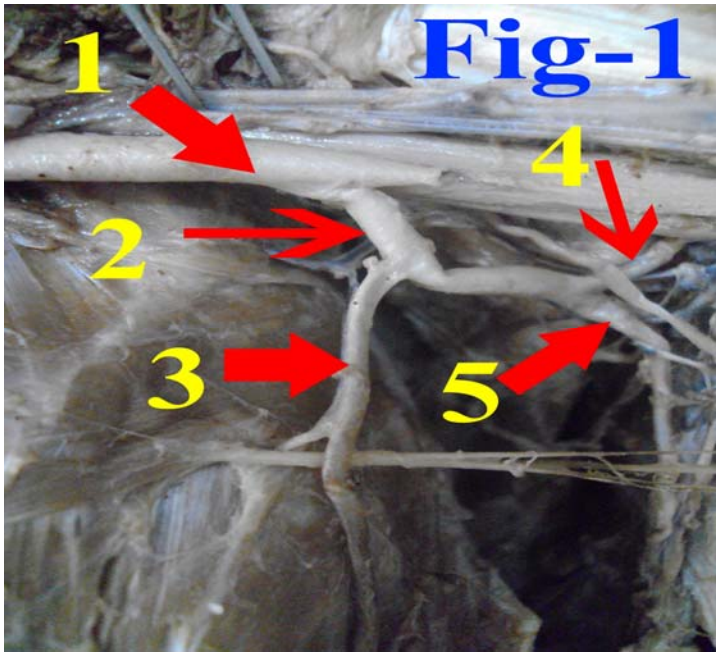
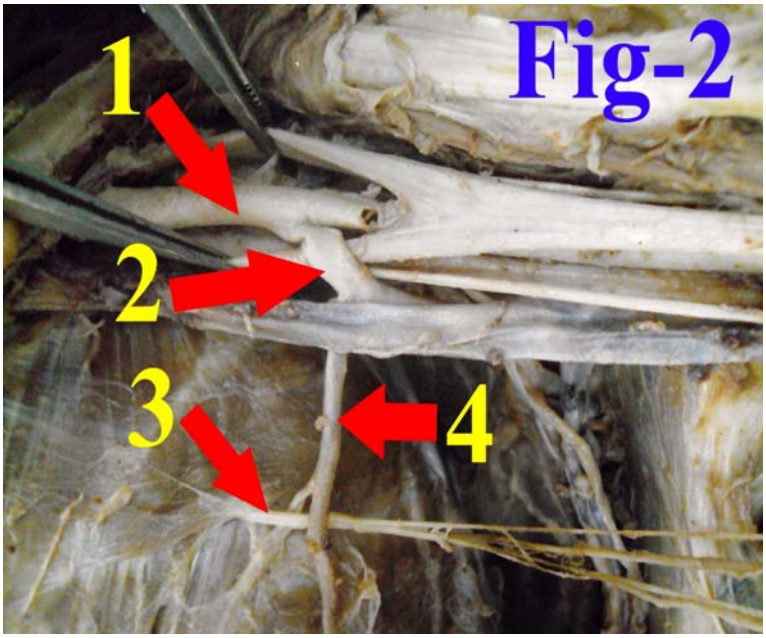


1- Axillary artery; 2- Common trunk; 3- Lateral thoracic artery; 4- Posterior circumflex humeral artery; 5- subscapular artery.

Figure 1: Showing unusual branching in the third part of axillary artery on left side.



1- Axillary artery; 2- Common trunk; 3-Long Thoracic Nerve; 4- Lateral thoracic artery;

Figure 2: Showing unusual branching in the third part of axillary artery in relation to long thoracic nerve on left side

DISCUSSION

Variations in branches of axillary artery have been reported, and so also the number of branches that arises from the different parts of it (Jahanshahi M, 2007). Translocations of branches from second to third parts of axillary artery and vice-versa have also been described (Tan CB, 1994). Reports have shown origin of lateral thoracic artery from varied source forming a common trunk with other artery (Reed WT, 1941).

During embryogenesis the lateral branch of the seventh cervical intersegmental artery becomes enlarged to form the axial artery of the upper limb which on further development becomes axillary, brachial, radial and ulnar artery (Jurjus AR, 1999).

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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 reappearance and may lead to variations in the arterial origins and courses of the major upper limb vessels (Hamilton WJ, 1972). Kosuri Kalyan Chakravarthi et al, (2012) reported that the lateral thoracic, thoracodorasal, posterior circumflex humeral and circumflex artery originated as a common trunk from the second part of axillary artery, whereas in this case lateral thoracic , subscapular artery and anterior circumflex artery were arising as a common trunk from third part of axillary artery. The long thoracic nerve also called as nerve of Bell or Posterior thoracic nerve characteristically arises by three roots from the fifth, sixth, and seventh cervical nerves, which supplies the serratus anterior muscle. The long thoracic nerve after passing behind the brachial plexus and axillary vessels ends by supplying the outer surface of the serratus anterior muscle along the side of thorax. The unusual course of lateral thoracic nerve in relation to lateral thoracic artery noted in this case may be susceptible to compression which may lead to winging scapula or long thoracic nerve palsy. Such neurovascular variations are important for the surgeon dealing with the axillary region to allow a safe surgery or appropriate treatment for compressive neuropathies.

Neurovascular anamoly found in this case may be due to (Kosuri Kalyan Chakravarthi et al, 2012).

a) The persistence of vessels normally obliterated.
b) Fusion and absorption of the parts usually distinct.
c) Incomplete development.
d) Choice of unusual path in primitive vascular plexus.

CONCLUSION

Anomalies in the origin and course of arteries may serve as a principal guide for the radiologists and surgeons. During surgery the abnormal branch may be a definite cause of concern if its presence is not kept in Mind (Samuel L, 1989). Therefore both the normal and abnormal anatomy of the region should be well known for accurate diagnostic interpretation and therapeutic intervention. Surgeons and orthopaedics should be familiar with these variations, which may complicate their task. Presence of such variation, a large common trunk as a branch of third part of axillary artery is worth considering during micro vascular graft to replace the damaged arteries, radical mastectomy operations, reconstruction of axillary artery after trauma, analyzing axillary region using imaging system or ultrasonography, treating axillary artery thrombosis etc (Karambelkar R-2011, Kumar M, 2008, Ramash T-2008).

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