



A RARE VARIATION OF AXILLARY ARTERY AND ITS CLINICAL SIGNIFICANCE

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ABSTRACT

Knowledge regarding the axillary vasculature is important for the planning of axillary nerve block, axillary lymph node resection and radical mastectomy. The presence of variation in the axillary vasculature may result in the postoperative complications such as bleeding. In the present study, a rare vascular variation reported and is of foremost importance for clinicians, anesthetist, surgeons, radiologist and anatomists. During routine dissection of an approximately 60-year-old female cadaver for the undergraduate medical students at All India Institute of Medical Sciences, New Delhi, we came across a variation in branching pattern of left axillary artery. An alar thoracic artery arose from the 3rd part of axillary artery in the cadaver which was supplying axillary fat and a lymph node. Along with this alar thoracic artery, a common arterial stump in 3rd part of axillary artery was giving one posterior circumflex humeral artery and three subscapular arterial branches. No other neurovascular variations were observed in the in axillary region.

KEYWORDS :

INTRODUCTION

Axillary artery is the direct continuation of the subclavian artery at the outer border of the first rib. In, its course the axillary artery is anatomically divided into three parts by the pectoralis minor muscle. The first part begins at the lateral border of the first rib and extends to the superomedial border of the pectoralis minor muscle. The first part is enclosed within the axillary sheath along with the axillary vein and brachial plexus. The second part is deep to the pectoralis minor and the third part lies between the inferolateral border of the pectoralis minor and the inferior border of the teres major muscle.¹ The axillary artery usually gives off six branches. The first part of the artery gives superior thoracic artery. The second part gives lateral thoracic and thoracoacromial branches. The third part gives subscapular artery, anterior and posterior circumflex humeral artery.² It is very common to find the variations in the branching pattern of axillary artery. Sometimes many of the branches may originate from a common stem which is known as the clumping of branches.^{3,4} Knowledge regarding the axillary vasculature is important for the planning of axillary nerve block, axillary lymph node resection and radical mastectomy. The presence of variation in the axillary vasculature may result in the postoperative complications such as bleeding. In the present study, a rare vascular variation reported and is of foremost importance for clinicians, anesthetist, surgeons, radiologist and anatomists. Many hypotheses have been proposed, to explain the variations in the upper limb arteries of the adult human found in adult cadavers, and also explained how these variations represent a transitory embryonic stage.⁵

MATERIALS & METHODS

During routine dissection of the axillae and upper limb of formalin fixed cadavers, an uncommon variation of the branching pattern of axillary artery was observed in one female cadaver aged 60 years. The axillary region was dissected very carefully after reflecting the pectoralis major and minor. All the branches of axillary artery were identified in three different parts of axillary artery according to its relation with pectoralis minor muscle. (Fig 1)

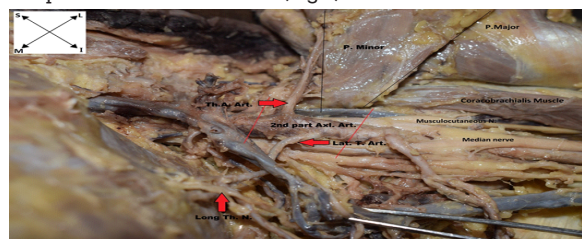


Figure-1

RESULT

In the present study, an unusual branch of thoracic artery, the alar thoracic artery arose from the 3rd part of axillary artery on left side in the cadaver which was supplying axillary fat and a lymph node. (Fig 2 & Fig 3)

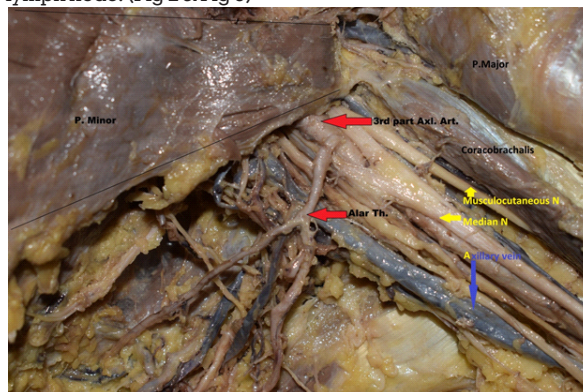


Figure - 2

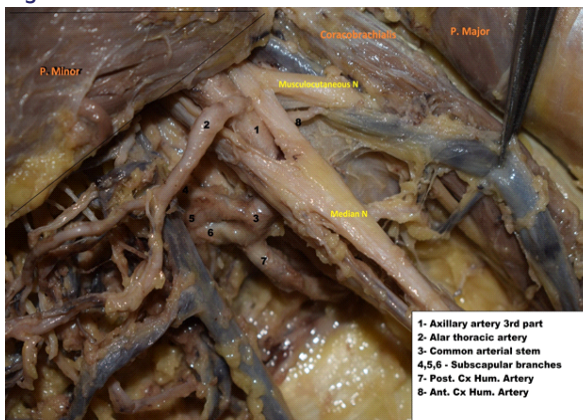


Figure-3

Along with this alar thoracic artery, a common arterial stump in 3rd part of axillary artery was giving one posterior circumflex humeral and three subscapular branches on left side. (Fig 3 & Fig 4) No other neurovascular variations were observed in the in axillary region.

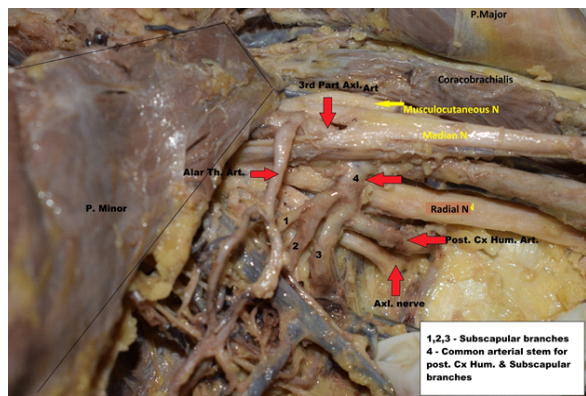


Figure – 4

DISCUSSION

Branching pattern of axillary artery is not so uncommon. It has been already reported that 28% of cases have variation in branching pattern of axillary artery. It has been also reported that Subscapular artery was arising from a common trunk with posterior circumflex humeral artery in up to 30% cases.⁶ Huelke in his study reported that subscapular artery may arise from any part of axillary artery, they reported in their study that it was arising in 0.6% cases from the first part of axillary artery, in 15.7% cases from the second part, and in 79.2% cases from the third part.⁷ A case study reported by George et al., in which the axillary artery gave a common arterial stump which in turn divided into a common circumflex humeral-subscapular trunk and profunda brachii artery.⁸ Samuel et al. reported about a common trunk from the third part of the axillary artery giving rise to anterior and posterior circumflex humeral, subscapular arteries and these branches in the arm given radial collateral, middle collateral and continued as the superior ulnar collateral artery.⁹ This kind of variation in branching pattern of axillary artery has been also reported earlier by Rao et al., in which they reported that the third part of the left axillary artery gave origin to profunda brachii, and ulnar collateral arteries along with subscapular, anterior and posterior circumflex humeral arteries.¹⁰ In the present case the third part of the axillary artery gave rise to alar thoracic & common trunk which divided into subscapular arteries.

The axillary arteries can be used as an inflow vessel in coronary artery surgery and also used as the site of cannulation in several vascular interventions like cardiopulmonary bypass, thoracic, and aortic procedures, for insertion of intra-aortic balloon pumps.¹¹ Repetitive injury or compression of the axillary artery in athletes can cause hyperplasia in vascular intima, which may cause aneurysm formation and aneurysms in branches also. Vascular aneurysm promotes thrombosis and distal embolism.¹² Variant branches of axillary artery as in the present case are also prone for such conditions. Variant common arterial trunks from axillary artery can be considered for cannulation. Variation in branching pattern of axillary artery may be due to the defect in formation of the vascular network at any stage of embryonic development. The developmental defects of surrounding tissue may also affect vascular variations. Knowledge of such variations in branching pattern of axillary artery is very crucial while performing bypass between the axillary and subclavian artery in subclavian artery thrombosis.¹³

All these applications make present variation noteworthy. Along with that, the knowledge of the vascular variation regarding the branches of axillary artery is important for surgeons and anesthetist during axillary nerve block or any axillary surgeries, and it can also help to decrease the

postoperative morbidity of the patients.

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