



Variations in the Branching pattern of the Axillary artery-A cadaveric case report

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Abstract : A variation in the branching pattern of second part of axillary artery was observed in the left axilla of 69 year old male cadaver during routine dissection. A common trunk was found to arise from second part of axillary artery ,which divides into lateral thoracic artery and subscapular artery. The subscapular artery divides into thoracodorsal artery and circumflex scapular artery. A common trunk was found to arise from third part which divides into anterior and posterior circumflex humeral arteries. Awareness of variation in the branches of axillary artery is important for the surgeons and radiologist.

Keyword : axillary artery, common trunk, subscapular artery, lateral thoracic artery.

Introduction:

Variations in the origin, branching and course of axillary artery has received clinical importance in the fields of vascular surgery, orthopaedics and anaesthesiology. The arterial system of upper limb begins with the axillary artery, which is the direct continuation of subclavian artery from the outer border of the first rib to the lower border of teres major. Pectoralis minor crosses and divides it into three parts-the first part is proximal, second part is posterior and third part is distal to it.¹ The first part give rise to superior thoracic artery. The second part gives rise to thoracoacromial artery and lateral thoracic artery. The third part gives rise to subscapular, anterior circumflex humeral and posterior circumflex humeral arteries. The subscapular artery is the largest which runs along the lateral border of the scapula. Approximately 4cm from its origin it gives circumflex scapular artery and then continues as thoracodorsal artery. Though this is the normal branching pattern of the axillary artery, previous studies documented different types of variations in their branching pattern and the course.

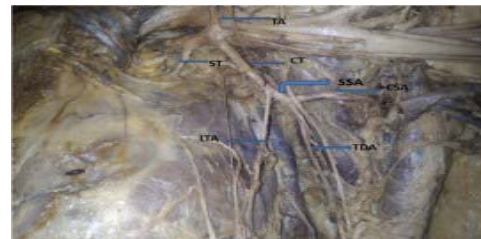
Methodology:

During routine dissection in the Department of Anatomy, we found this unique variation in the left axilla of a 69 year old male cadaver. The cadaver was examined for any traumatic lesions or surgical procedure in the neck and the axillary region. Dissection of the axillary region was done as explained by Romanes in the Cunningham's manual of practical anatomy.² The axillary artery and its branches were noted.

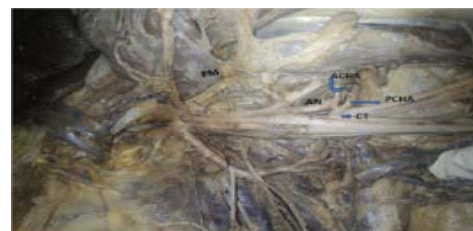
Observation:

The branching pattern and the course of the axillary artery was noted. The first part gave rise to superior thoracic artery.

Thoracoacromial artery arose from second part and divided into 4 branches. A common trunk was found opposite the origin of thoracoacromial artery.



Branches from first and second part of axillary artery



Branches from third part of axillary artery

The common trunk divided into lateral thoracic artery and subscapular artery. The subscapular artery gave rise to circumflex scapular artery and then continued as thoracodorsal artery. The anterior circumflex humeral and posterior circumflex humeral arteries rise from a common trunk from the third part of the axillary artery.

Discussion:

Variations in the branching pattern of the axillary artery were due to defects in the embryonic development of the vascular plexus of upper limb bud. The proximal part of the axial artery derived from lateral branch of seventh intersegmental artery form the axillary and brachial artery. According to Arey, the unusual blood vessels may be due to incomplete development ,fusions and absorption of the parts usually distinct or due to persistence of vessels which were normally obliterated or due to disappearance of vessels which were

normally retained or due to the choice of unusual paths in the primitive vascular plexuses.³ According to Hamilton and Mossman, the anomalies or variations in the branching pattern of artery of upper limb is due to abnormal sprouting and regression of the arterial system in upper limb bud.⁴ De Garis and Swartley described 23 different types of axillary artery, on the basis of the origin of their branches.⁵ Chitra and Anandhi (2013) reported a common trunk from second part that gave rise to lateral thoracic, posterior circumflex humeral and subscapular arteries.⁶ Ranjana Verma (2014) reported a collateral branch from second part which gave rise to lateral thoracic artery and at the level of formation of median nerve it terminated into three branches-anterior circumflex humeral, posterior circumflex humeral and accessory subscapular artery.⁷ Sreeja and Leo Rathinaraj (2014) reported a similar branching pattern where the lateral thoracic and subscapular artery arose from common trunk, which arose at the junction between the second and third part of the axillary artery.⁸ In the present case, the common trunk arose opposite the origin of thoracoacromial artery. Huelke reported 11.2% of common stem for both circumflex humeral arteries.⁹ De Garis and Swartley in their study reported 15.8% of common stem for both circumflex humeral arteries.⁵ Karambelkar, Avinash and Umarji (2011) reported a common trunk for anterior and posterior circumflex humeral arteries in 20%.¹⁰ Variation in the origin, course and the branching pattern of the axillary artery is clinically important for orthopaedic surgeons who do surgical correction for the dislocation of shoulder joint which may injure the axillary artery.¹¹ This knowledge of variation is also clinically important in the following procedures, during the antegrade cerebral perfusion surgery in aortic surgery¹² when creating bypass between axillary artery and subclavian artery in subclavian artery occlusion¹³, using axillary artery as the graft for replacing the damaged artery, radical mastectomy, axillary ultrasonography and medial arm skin flapping procedure.¹⁴ Thus the sound knowledge about normal and the abnormal origin, course and branching pattern of the axillary artery is vital for the clinician's scientific practice which includes the accurate diagnosis and surgical intervention.

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