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RESEARCH ARTICLE

BILATERAL VARIATION IN THE BRANCHING PATTERN OF THE AXILLARY ARTERY - A CASE REPORT

Hajira Fatima, N. Hima Bindu, Faiz Hussain Mohammad and Dasari Chandipriya

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Key words:-

Axillary Artery, Subscapular Artery,
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Abstract

During routine dissection of a male cadaver for I year MBBS students in the department of Anatomy bilateral variations in the branching pattern of Axillary artery were observed. In the present study it was observed that, on the left side, the subscapular artery which usually arises from the third part of Axillary artery was found to be originating from the second part along with the lateral thoracic artery and thoraco-acromial artery whereas anterior circumflex humeral artery and posterior circumflex humeral artery originated from the third part as usual. On the right side, the circumflex scapular artery and the Thoracodorsal artery were arising as a common trunk from the third part which is not the usual pattern. Knowing such variations is of utmost significance in performing various clinical procedures by Vascular surgeons, Radiologists, Clinical anatomists and in interventional and diagnostic procedures in cardiovascular diseases.

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Introduction:-

Axillary artery is a continuation of subclavian artery which extends from the outer border of first rib to the lower border of teres major muscle from where it continues as brachial artery. The pectoralis minor divides the Axillary artery into three parts and is related anteriorly to the Axillary artery. The first part extends from the outer border of first rib to the upper border of pectoralis minor muscle, second part lies behind the pectoralis minor muscle, the third part extends from the lower border pectoralis minor muscle to the lower border of teres major muscle. The first part gives off superior thoracic artery, second part gives off lateral thoracic and thoraco-acromial artery, third part gives off subcapular artery, anterior circumflex humeral and posterior circumflex humeral arteries. The subscapular artery divides into circumflex scapular and Thoracodorsal arteries [14].

Case report:

During routine dissection hours of undergraduate medical students, bilateral variations in the branching pattern of Axillary artery was observed. Dissection procedure as mentioned in Cunningham's manual of Practical Anatomy was followed. Thoracic dissection incisions were

made [incisions 1-4 in Cunningham's] and axilla was dissected[11] on both sides of a male cadaver. The dissection involved the removal of skin, fascia, loose connective tissue, fat, and lymph nodes exposing the Axillary artery and other contents of the axilla. The coraco-brachialis and biceps brachii muscles were exposed and Axillary artery medial to these muscles was identified. The three parts of Axillary artery and its branches were exposed by cutting and retracting the pectoralis minor muscle from its origin [11]. Upon proceeding with the dissection it was observed that, on the left side, first part gave rise to superior thoracic artery whereas from the second part subscapular artery also originated which is normally a branch of third part of Axillary artery along with lateral thoracic and Thoraco-acromial arteries. This branch supplied both subscapularis and latissimus dorsi [Figure 1]. From the third part originated the anterior circumflex humeral and posterior circumflex humeral arteries as usual and a subscapular artery that supplied both subscapularis and latissimus dorsi. But neither of them gave origin to circumflex scapular branch and the subscapular branch arising from 2nd part was seen to be of larger calibre. On the right side, 1st part and 2nd parts of axillary artery demonstrated usual branching pattern. But the branches of 3rd part of axillary artery were anterior, posterior circumflex humeral arteries and a common trunk. This common trunk was seen giving rise to three individual branches (i.e) the subscapular, circumflex scapular and thoracodorsal arteries, which is not a usually observed pattern.[figure 2].

Discussion:-

The knowledge of Axillary artery variations helps while performing bypass between the axillary and subclavian artery in surgical treatment of subclavian artery occlusion [10]. In cardiopulmonary bypass, thoracic, and aortic procedures, for insertion of intra-aortic balloon pumps, axillary artery is successfully used as a cannulation site [15]. Athletes are prone to focal intimal hyperplasia, aneurysm formation, segmental dissection, and branch vessel aneurysms due to repetitive positional compression of the axillary artery leading to thrombosis and distal embolism requiring positional arteriography for diagnosis [18]. Injury to the brachial plexus is very common requiring exploration and repair. Thus knowledge of such variations is very important and can lead to complications if ignored [12, 13]. Vascular grafts from branches of upper extremity arteries are used in reconstructive surgeries of the axillary artery after trauma and during coronary bypass grafting [9]. According to literature the subscapular artery arises from the second part in 4% of cases and in 30% cases it arises from a common trunk with posterior circumflex humeral artery [8]. According to study by Huelke, subscapular artery originated from the first part in 0.6% case, from the second part in 15.7% cases and from the third part in 79.2% cases [6]. Srimathi reported a case in which second part of Axillary artery gave a common trunk from which thoracoacromial, lateral thoracic, subscapular, and posterior circumflex humeral arteries originated[17]. Common trunk for lateral thoracic artery and subscapular artery from the second part of Axillary artery was also reported by Shantakumar SR and Rao KGM [16] similar to the finding in the present case on the left side[figure 1]. Same type of variation was also reported by Deepshikha Singh et al in their case report [4]. Ezzati M et al, also reported a similar finding[7]. According to Samta gaur et.al 4% of cases showed circumflex scapular artery directly arising from the third part of Axillary artery [8] which is a similar finding in the present case on the right side[figure 2]. Divya et al reported a similar case[5]. Venieratos and Lolis reported a case, which showed common subscapular trunk giving origin to circumflex scapular, thoracodorsal, anterior and posterior circumflex humeral profunda brachii and ulnar collateral arteries[18]. The type and frequency of vascular variations should be well documented and understood due to increasing use of invasive diagnostic and interventional procedures in cardiovascular diseases[5]. Abscess, trauma, tumours, lymph nodes are commonly encountered in the Axillary region. Certain surgeries like the breast carcinoma involves Axillary lymph node dissection. Thus knowledge of such variations should be kept in mind to avoid complications [1]. Aberrant Axillary artery branches are prone to bleeding in cases of chronic shoulder dislocation. knowledge of such variations can help the surgeons in avoiding complications resulting due to bleeding[11,10].

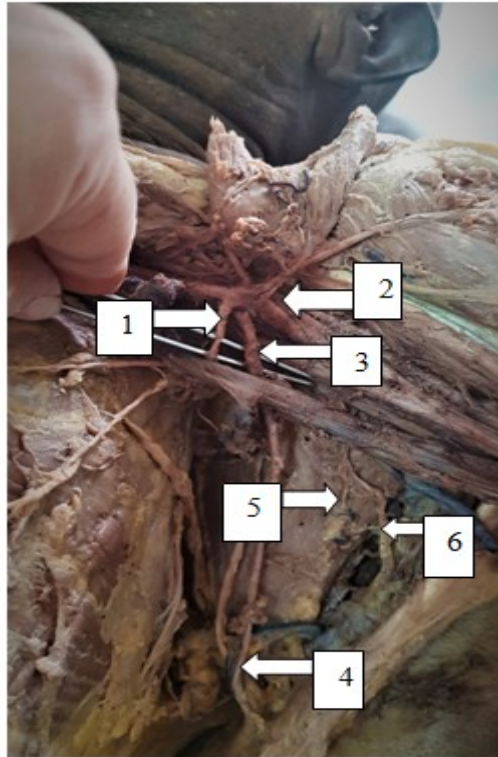


Figure 1:- Showing the branches of second and third part of axillary artery on the left side.

1. Lateral thoracic artery, 2. Thoracoacromial artery, 3. Subscapular artery, 4. Thoracodorsal artery, 5. Subscapular artery (3rd part), 6. Thoracodorsal artery to latissimus dorsi (3rd part)

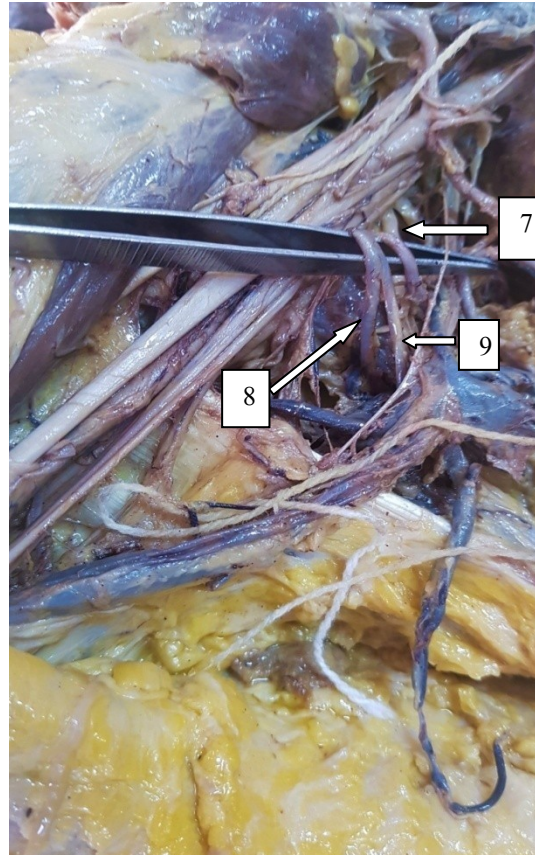


Figure 2:- Subscapular artery, circumflex scapular artery, Thoracodorsal artery arising as a common trunk from the third part of the artery on the right side.

7. Subscapular artery, 8. Circumflex scapular artery, 9. Thoracodorsal artery

Conclusion:-

Axillary artery variations are frequently encountered and documented in the literature. Hence comprehensive knowledge on the variations of this artery is important for the clinicians and surgeons performing surgical procedures involving the axilla and also in the use of invasive diagnostic and interventional procedures in cardiovascular diseases.

Conflict of interest:

None.

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