

Research Article: Human Anatomy Case Report

## A rare case report of subscapular artery

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### Summary

Axillary artery is one of the most important arteries of the upper limb, which is a continuation of the subclavian artery. It begins at the lateral border of the first rib and ends at the inferior border of the teres major where it becomes the brachial artery. Axillary artery has six important branches included: 1) Superior thoracic artery 2) Thoracoacromial artery 3) Lateral thoracic artery 4) Subscapular artery 5) Posterior circumflex humeral artery 6) Anterior circumflex humeral artery. Subscapular artery arises from the third part of axillary artery normally and then divides into circumflex scapular artery that extremely enters the triangular space. The other branch of subscapular artery, the thoracodorsal artery, accompanies thoracodorsal nerve to lateral border of scapula and supplies and innervates that region. In this case the subscapular artery was absent in both sides and instead of that the circumflex scapular artery was directly derived from axillary artery and the thoracodorsal artery is separated from circumflex scapular artery as a thin and short branch, too. It seemed that the lateral thoracic artery, which was thicker than its normal condition, supplied the muscles of the lateral part of scapula and the thoracodorsal muscle. Other branches of the axillary artery demonstrated without any abnormality. Since axillary artery has the highest rate of rupture and damage coming after the popliteal artery, knowing the variations is important and essential for surgeons, radiologist and anatomist.

### Keyword

Axillary artery, circumflex scapular artery, thoracodorsal artery, subscapular artery.

### Introduction

The Axillary artery is a large blood vessel that conveys oxygenated blood to the lateral aspect of the thorax, the axilla (arm pit) and the upper limb (Adachi, 1928). The axillary artery is a continuation of the subclavian artery (Compta, 1991). It begins at the outer border of the first rib, ending at the inferior border of the Teres major and continuing further distally as the brachial artery (Sauerland, 1995). The Axillary artery is accompanied by the Axillary vein along its length and in the axilla it is surrounded by the brachial plexus (Hollinshead, 1958). The pectorals minor muscle crosses it inferiorly and divides it into three parts (Sauerland, 1995). The axillary artery is conveniently described as giving off 6 branches but the number arising independently from it is subject to considerable variations; two or more of usual branches

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may arise by a common trunk or branch of a usually named artery may arise separately (Huber, 1930). The most frequent anatomic variations of the axillary artery are the persistent superficial brachial artery, high division of the brachial artery, radial artery and ulnar artery (Huelke, 1958; Iwahira et al. 1996; Jurjus et al., 1986). The subscapular artery is the largest branch of the Axillary artery and is usually detached from the third part of Axillary artery. It arises at the distal border of the subscapularis muscle, which it follows to the inferior angle of the scapula, where it anastomoses with the lateral thoracic and intercostals arteries and with the descending branch of the transverse cervical artery. The mentioned artery supplies the wall of thorax and nearby muscles and is accompanied by the nerve to latissimus dorsi muscle. About 4 cm from its origin it gives off two branches, the circumflex scapular artery and the thoracodorsal artery (Hollinshead, 1958). The circumflex scapular artery is larger of the two terminal branch of the subscapular artery; curves backwards around the lateral border of scapula and travels through the triangular space. There are some arteries in the scapular region which anastomoses with each other and supply the muscles around the scapula (Hollinshead, 1958). A detailed knowledge of variations of branching pattern of vessels is essential for providing accurate diagnosis and repair of blood vessels in surgical emergencies.

### Case report

The case was observed in a 45-year-old cadaver at the dissection room of Tabriz medical university of science. After removing the skin of anterior and posterior part of axilla (arm pit) and sectioning pectoralis minor, pectoralis major and subclavious muscles the existing components of the axilla region were brought into view (McCormack et al., 1953). By separating the Axillary artery from the brachial plexus and showing its branches separately, the subscapular artery, which was detached from the third part of the Axillary artery, was specified and its branches were exposed to show, then we named this artery by pursuing the circumflex scapular artery to the anatomical triangular space posterior to the scapula. Of course as mentioned, the skin of the posterior part of the scapula was removed earlier by two sections, a vertical section near the vertebral column and a transverse section across the superior border of scapula, and the triangular space and quadrangular space, were seen among the muscles.

By examining both axillary regions and uncovering the axillary artery, its branches namely: superior thoracic, thoracoacromial, lateral thoracic, subscapular, lateral and anterior circumflex humeral arteries were identified.

The subscapular artery which is regarded as the largest branch of the axillary artery was shorter than its normal length in both sides and the circumflex scapular artery was a continuation of it instead of being detached from it. A thin, short branch was separated from it, near its origin and it seems that this artery supplies a small part of the superior region of lateral border of scapula that is to say it plays a part of the thoracodorsal artery's role in supplementing that region.

The lateral thoracic artery seemed thicker than its normal size in both sides and had branches to lateral border of scapula (Fig. 1).



**Figure 1** – Photograph showing axillary artery and circumflex artery.

## Discussion

The distribution and course of the arteries of superior extremity of human beings are subject to multiple variations at different levels, as reported in earlier studies (Thorek, 1951). Except for the subscapular and lateral thoracic arteries, other branches of the axillary artery were detached from their normal origin.

Considering the thin and shortness of the thoracodorsal artery it seems that the supplementation of the lateral part of the scapula can not be complete and therefore there should be some accessory branches.

According to the excessive thickness of the lateral thoracic artery in this case it seems that this artery plays a supportive rule in supplementing the lateral part of scapula.

In 40 limbs (80%), the subscapular artery was detached from 3rd part of axillary artery either directly (58%) or in common with posterior circumflex humeral (18%), profunda brachii (2%) or deep division of brachial artery (2%). Out of the rest 10 limbs (20%); in 8 (16%) it was arising from 1st part either directly (6%), or in common with lateral thoracic (6%) or posterior circumflex humeral (4%); while in 2 limbs (4%) it was absent (Thorek, 1951). The earlier reports of absence of this artery ranged from 1.7% (Williams et al., 2005) to 8.3% (Patnaik et al., 2000). In this case the circumflex

scapular artery was directly detached from the third part of the axillary artery and it gave off a short branch to latissimus dorsi muscle. So one should be very cautious during this type of surgery and look for a common trunk of origin for subscapular and posterior circumflex humeral or for absence of subscapular in which case, it is advisable not to attempt ligation.

considering the importance of the axillary artery and the fact that after the popliteal artery it has the second highest rate of puncture and damage in intense movements and its role in bleedings in distal part of limbs (in injuries, surgeries and embolies) knowing the variations of this artery can be significantly helpful in surgeries and clinical procedures. The clinical importance of the described axillary variation is of utmost significance for surgeons, cardiologists and vascular specialists. It is especially relevant in cases of arteriovenous fistula, aneurysms and abscess drainage in region of axilla, arm and cubital fossa. Awareness of such abnormal axillary vasculature is crucial in use of superficial brachial artery flap in plastic surgery (<http://en.wikipedia.org/wiki/axillary-artery>) and protection of axillary artery in breast cancer surgery.

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