



# Unusual origin and potentially hazardous course of the major blood vessels in neck — A clinically relevant rare case

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## ABSTRACT

We present a rare case of aberrant left brachiocephalic vein and brachiocephalic artery, which crosses the trachea in the neck obliquely and closely related to lower border of thyroid gland. If not noticed while performing open or percutaneous dilatational tracheostomy or other neck surgeries, trauma to these vessel and subsequent hemorrhage can occur and may be fatal. Vascular compression of the airway causing obstructive symptoms can also occur due to this anomaly. In this report the case is presented along with its clinical significance. © IJAV, 2010; 3: 61–62.

**Key words** [left brachiocephalic vein] [brachiocephalic trunk] [tracheostomy] [percutaneous dilatational tracheostomy]

## Introduction

Left brachiocephalic vein begins from junction of left subclavian and left internal jugular vein posterior to medial end of left clavicle. It crosses to the right moving slightly in inferior direction and joins with right brachiocephalic vein to form superior vena cava. During its oblique course it crosses the left subclavian artery, left common carotid artery and brachiocephalic trunk in the superior mediastinum.

Brachiocephalic trunk is described as the largest branch of the arch of the aorta, 4 to 5 cm in length, and arises from the arch's convexity, posterior to the center of the manubrium sterni. It ascends posterolaterally to the right, at first anterior to trachea, then on its right. At the level of right sternoclavicular joint's upper border it divides into right common carotid and right subclavian arteries [1]. At the lower part of neck the two common carotid arteries are separated from each other by a very narrow interval, which contains the trachea (Figure 1).

## Case Report

During routine educational dissection for undergraduate students in our department, this unusual origin of left brachiocephalic vein and brachiocephalic artery was observed in a male cadaver aged about 60 years.

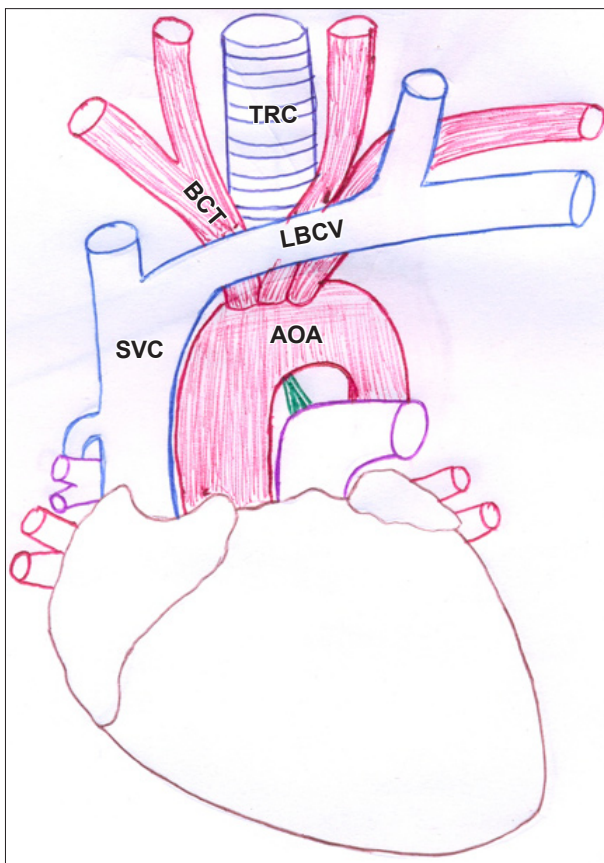
In the region of anterior triangle of the neck after removal of skin, superficial fascia, deep fascia and the infrahyoid muscles, it was found that the left brachiocephalic vein and brachiocephalic artery both were crossing obliquely

in front of trachea just below the thyroid gland (Figure 2).

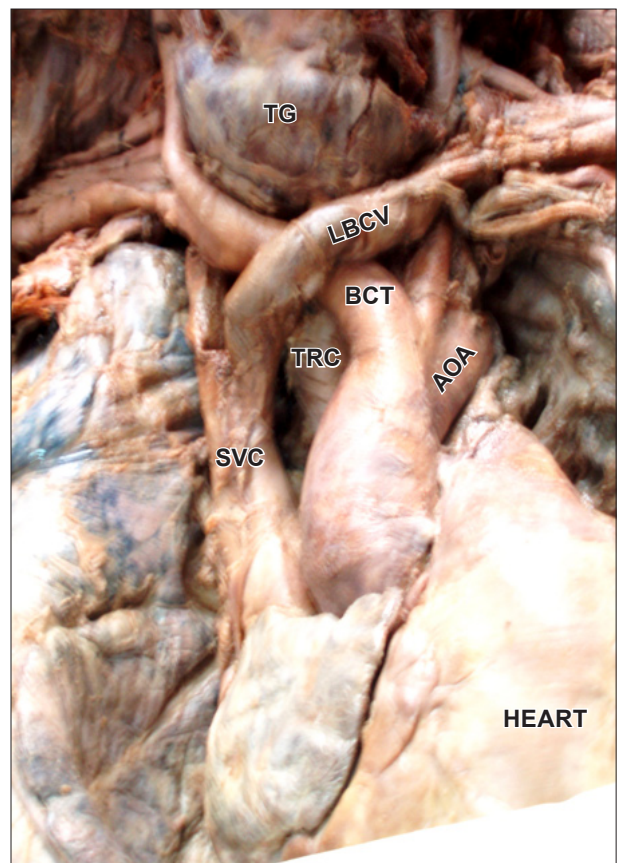
## Discussion

There are few reports of anomalies in left brachiocephalic vein like anomalous sub-aortic brachiocephalic vein [2], rare retro-aortic brachiocephalic vein [3]. Muhammad et al. observed that high brachiocephalic vein was source of bleeding during percutaneous dilatational tracheostomy (PDT), in one case out of 6 bleeding patients in a series of 497 PDT procedures [4]. We also found high left brachiocephalic vein, crossing from left to right in front of trachea and just below thyroid gland.

There are also reports of variations of brachiocephalic artery [5] and subclavian artery [6], which may lead to problems during tracheostomy. Comert et al. [7] found an innominate artery crossing 4th and 5th tracheal ring while Iterezote et al. [8] observed brachiocephalic trunk originating from the aortic arch in front of the trachea. Gupta and Mehta also reported a case of brachiocephalic artery crossing in front of trachea [9]. In present case, the brachiocephalic artery and left brachiocephalic vein following an unusual course and lying in front of trachea such as occluding space for tracheostomy. The anatomy of aberrant great vessels is relevant in surgeries of the anterior neck, especially tracheostomy and thyroidectomy [10]. This case is a rare variant where the left brachiocephalic vein and brachiocephalic artery lie directly in the line of incision for tracheostomy or in the path of guide wire that is inserted in PDT.



**Figure 1.** Diagrammatic representation of major blood vessels relation with trachea. (**LBCV**: left brachiocephalic vein; **AOA**: arch of aorta; **BCT**: brachiocephalic trunk; **SVC**: superior vena cava; **TRC**: trachea)



**Figure 2.** Unusual origin and potentially hazardous course of major blood vessels in neck. (**TG**: thyroid gland; **LBCV**: left brachiocephalic vein; **AOA**: arch of aorta; **BCT**: brachiocephalic trunk; **SVC**: superior vena cava; **TRC**: trachea)

Such a variant is of vital significance during surgeries and even more important in PDT, which has gained wide acceptance due to its relative speed, simplicity and the ability to perform it at the bedside but the major disadvantage is the increased risk of peri-operative complication of severe bleeding.

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