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### Case report

## Anomalous origin of an arterial trunk from brachiocephalic artery

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#### ABSTRACT

Variations in the branching pattern of brachiocephalic artery are not uncommon. An anomalous arterial trunk was found originating from brachiocephalic artery in a male cadaver aged about 74 years on routine dissection of cervicothoracic region of 20 cadavers. This anomalous arterial trunk trifurcated giving rise to the branches which supplied thyroid gland, thymic remnants and pericardium. The knowledge of this anatomical variation is important for the surgeons and radiologists to avoid the complications during surgeries and investigative procedures.

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### 1. Introduction

Normally brachiocephalic artery being the largest branch of arch of aorta originates behind the centre of manubrium sternum. At first this artery ascends posterolaterally to the right but anterior to the trachea, then to the right of trachea where it divides into right subclavian artery and right common carotid artery behind the right sternoclavicular joint. Occasionally it gives rise to arteria thyroidea ima which may arise from arch of aorta or subclavian artery or common carotid artery or internal mammary artery.

### 2. MATERIALS AND METHODS:

On routine dissection in cervicothoracic region of 20 adult embalmed cadavers in the dissection hall of department of anatomy, Alluri Sitaramaraju Academy of Medical Sciences, Eluru from 2013 to 2014, an anatomical variation in the form of anomalous arterial trunk from brachiocephalic artery was observed in a male cadaver aged about 74 years. The position and length of anomalous arterial trunk were noted. The branches of this anomalous arterial trunk were also noted and photographed.

### 3. RESULTS:

This anatomical variation was found originating from the ventral aspect of brachiocephalic artery 1.5 cm below the origin of right common carotid artery and 3.5 cm above and lateral to the origin of brachiocephalic artery from arch of aorta. The length of this anomalous arterial trunk was measured 1.5 cm. It was directed

downwards and medially over the brachiocephalic artery and divided into three branches. One ascending branch directing upwards and medially in front of trachea was found to divide into two branches supplying isthmus of enlarged thyroid gland and upper part of the thymic remnant. One descending branch directing downwards and medially over the origins of left common carotid and left subclavian arteries was noted to supply the lower part of thymic remnant. Another descending branch directing downwards over the arch of aorta was bifurcated into two branches which supplied the pericardium.

A pair of superior and a pair of inferior thyroid arteries with their normal caliber were found supplying the enlarged thyroid gland.

### 4. DISCUSSION:

Usually the development of blood vessels is a process of angiogenesis and remodeling leaving behind normal vasculature but occasionally if this remodeling is not complete, the anatomical variations may occur as a supplement or substitute for the normal arteries.

If this anomalous arterial trunk originating from the brachiocephalic artery supplies only the isthmus of thyroid gland, it can be called as arteria thyroidea ima. If this anomalous arterial trunk originating from the brachiocephalic artery supplies not only the isthmus of thyroid gland but also the thymic remnants and pericardium, it can be named as thyrothymic trunk as described by Kimmel (1949). Krudy et al., (1980) reported some cases showing similar course of this artery.

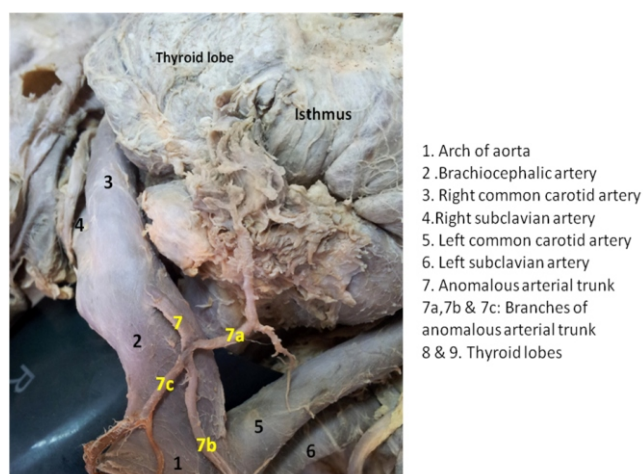
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The thyroid gland, a highly vascular organ, is supplied by a pair of superior thyroid, inferior thyroid and occasionally a thyroidea ima artery, either accessory to or replacing the inferior thyroid artery (Hollishead 1962).

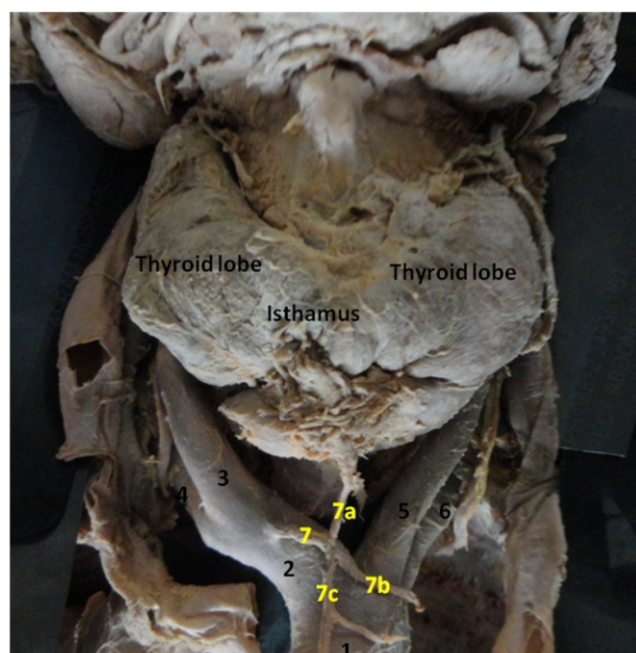
An additional midline artery to the thyroid posing a threat in cervicosurgical operations was first described by Neubauer in 1772 and so was named Neubauer's artery.

The incidence of origin of thyroidea ima artery was from brachiocephalic artery (1.9% -10.6%), from right common carotid artery (1.4%-1.7%) as noted by Gruber, 1872, from arch of aorta (0.36%) by Hollinshead, 1962. Bilateral arteria thyroidea ima was also described by Gruber 1872.

**Figure - 1**



**Figure - 2**



## 5. Conclusion

Clinically it cannot be diagnosed due to lack of clinical features but on routine angiography, it can be identified or sometimes may be missed. Thorough knowledge of this anatomical variation is important for the surgeons to avoid intra operative complications during the surgeries like low tracheostomy and for radiologists to avoid complications during procedures like mediastinography.

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