

Case Report: Absence of Thyrocervical Trunk

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ABSTRACT

The thyrocervical trunk most commonly arises from the upper portion of the first segment of the subclavian artery, close to the medial edge of the scalenus anterior muscle and after short distance is divided to the inferior thyroid, transverse cervical, and suprascapular artery. This study reports important variations in branches of the thyrocervical trunk in a singular female cadaver. On the right side, no thyrocervical trunk was found. The two branches which normally originate from the thyrocervical trunk had a different origin. The superficial cervical, suprascapular and internal thoracic arteries arose from the common trunk artery. An awareness of this rare variation is important because this area is used for diagnostic and surgical procedures.

1. Introduction

Reinvestigation of the configuration of the human thyrocervical trunk revealed, that is a direct branch of the subclavian artery [1]. According to textbook descriptions, the thyrocervical trunk most commonly arises from the upper portion of the first segment of the subclavian artery, and close to the medial edge of the scalenus anterior muscle. The branches of the thyrocervical trunk are inferior thyroid, superficial cervical, and suprascapular artery.

In some cases, the superficial cervical artery is called the superficial branch of the transverse cervical artery because its course is superficial to the levator-rhomboid muscle group. The dorsal scapular artery is called the deep branch of the transverse cervical artery because its course is deep to the levator-rhomboid group. The descending branch of the transverse cervical artery was the main vessel for the lower (ascending portion) trapezius that runs deep to the sternocleidomastoid and superficial to the levator [2]. This paper describes a rare case of anomaly in which the thyrocervical trunk is absent.

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2. Case report

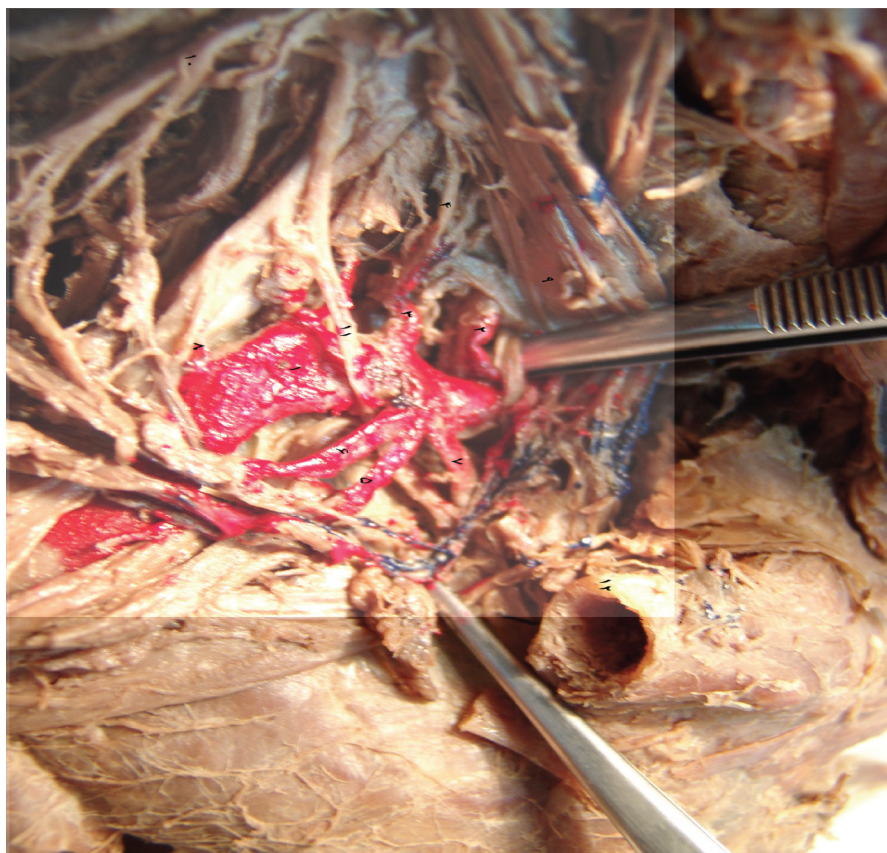
This anomaly of the thyrocervical trunk was found in a 63-year-old Iranian's female cadaver during a dissection session for medical students in a 2007 head and neck anatomy course at Kashan University of Medical Sciences. She had no history of surgical procedures. She was fixed conventionally by arterial perfusion with 10% formalin and subsequently dehydrated with 50% ethanol [3].

On the right side of the neck, no thyrocervical trunk was found but, the inferior thyroid artery was occupying its place. The two branches which normally originate from the thyrocervical trunk had a different origin. The superficial cervical, and suprascapular arteries originated from the A cervico-scapulo-thoracic trunk [4]. A cervico-scapulo-thoracic trunk gave rise from the anteroinferior aspect of the first part of the subclavian artery. This trunk immediately divided into the internal thoracic, superficial cervical and suprascapular arteries (Figure 1, 2).

3. Discussion

Except for the thyrocervical artery, detailed investigations on the development of the subclavian branches in man are scant. However, in general, this segment of the subclavian, which constitutes the transition zone from the dorsal intersegmental to the limb artery [5] and supplies such heterogeneous elements as the thyroid gland and the omocervical region, may be considered as prone to variability. The omocervical vessels comprise longitudinal anastomoses (cervical ascending artery) and transversal vessels (transverse cervical, suprascapular artery and dorsal scapular artery) [5-6]. The first channels to the median primordium of the thyroid gland come from the aortic arch, the innominate and the carotids. Secondly, they are substituted by a lateral source from the subclavian [7].

The earliest representation of an artery, which pierces the brachial plexus, is seen in a 9.5 mm embryo [8]. This might represent the dorsal scapular artery, although it is rather rare for this artery to pass between the fifth and



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Figure 1. Photographs of the right side of the dissected neck.

Arteries: 1=right subclavian (red), 2=vertebral, 3=inferior thyroid, 4=ascending cervical, 5=superficial cervical, 6=suprascapular, 7=internal thoracic, 8=Dorsal scapular artery, 9=right common carotid, 10=Brachial plexus, 11=phrenic nerves, 12=clavicle cut.



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Figure 2. Schematic drawing of the right subclavian variation on the right side of the neck.

Arteries: 1=right subclavian (red), 2=vertebral, 3= inferior thyroid, 4=ascending cervical, 5=uperficial cervical, 6=suprascapular, 7=internal thoracic, 8=Dorsal scapular artery, 9=right common carotid, 10=Brachial plexus, 11=phrenic nerves, 12=clavicle cut.

sixth cervical roots as in this case [9-10]. The development of this vessel thus seems to precede the formation of the inferior thyroid artery, which is seen in a 23 mm embryo [11]. In a thyrocervical trunk apparently the (secondary) inferior thyroid has been fused with the omocervical supply [6].

Thus, the thyrocervical trunk turns out to be a late acquisition in comparative anatomy, which is typical only for man; furthermore, it is the result of more or less complete fusion of different components, which occurs relatively late in individual development. Therefore, a very general explanation of the variability may be found in the late phylogenetic and ontogenetic appearance of the thyrocervical trunk.

As a substitute for this artery, inferior thyroid artery, superficial cervical artery, and suprascapular artery are normal branches of thyrocervical trunk. The internal thoracic artery participates in the thyrocervical trunk in more than 10% of the observed cases [1]. This paper describes a rare case of anomaly in which the right thyrocervical trunk was absent.

A cervico-scapulo-thoracic trunk gave rise from the anteroinferior aspect of the first part of the subclavian artery. This trunk immediately divided in to the internal thoracic, superficial cervical and suprascapular arteries. The convention used in labeling trunks was similar to that described for other trunk formations in the body (e.g. linguo-facial, cervico-dorsal, cervico-scapular and cervico-dorso-scapular trunks) [13].

According to textbook descriptions, the thyrocervical trunk most commonly arises from the upper portion of the first segment of the subclavian artery, and close to the medial edge of the scalenus anterior muscle. Opposite the thyrocervical trunk, the internal thoracic artery descends toward the anterior thoracic wall.

According to the recent version of *Nomina anatomica* (1977), the branches of the thyrocervical trunk are inferior thyroid (with cervical ascending), transverse cervical (distributing branches to the superior part of the trapezius), and suprascapular artery.

This definition does not appear to be based on general agreement with respect to the usual site of origin of the cervico-scapulo-thoracic trunk.

Prevalence of origin of an internal thoracic artery from the thyrocervical trunk on left sides and in females appears to be the only side- and sex-related finding [10, 14-16]. Frequency of actual participation in the thyrocervical trunk and the decided tendency to group with the trunk suggest that the internal thoracic artery should be considered as the second facultative branch of the thyrocervical trunk.

These changes, coupled with improper knowledge of the gross anatomy and nomenclature of the arteries in the posterior cervical triangle, have presented difficulties in musculocutaneous flap planning, especially in plastic and reconstructive surgery [13]. Surgery on the scalenus anterior muscle and on the first rib [10], angiography [16], or attempts to apply cytostatic drugs to cervical regions via intraarterial catheter [17] is fields of clinical significance involving these subclavian branches.

4. conclusion

On the right side, no thyrocervical trunk was found. The two branches which normally originate from the thyrocervical trunk had a different origin. The superficial cervical, suprascapular and internal thoracic arteries arose directly from the common trunk artery. An awareness of this rare variation is important because this area is used for diagnostic and surgical procedures.

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