

Thyrolingual trunk arising from the common carotid artery a case report

V. Lemaire, G. Jacquemin, M. Medot and J. Fissette

Department of Human Anatomy, University of Liège, rue de Pitteurs 20, B-4020 Liège, Belgium

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Correspondence to: J. Fissette

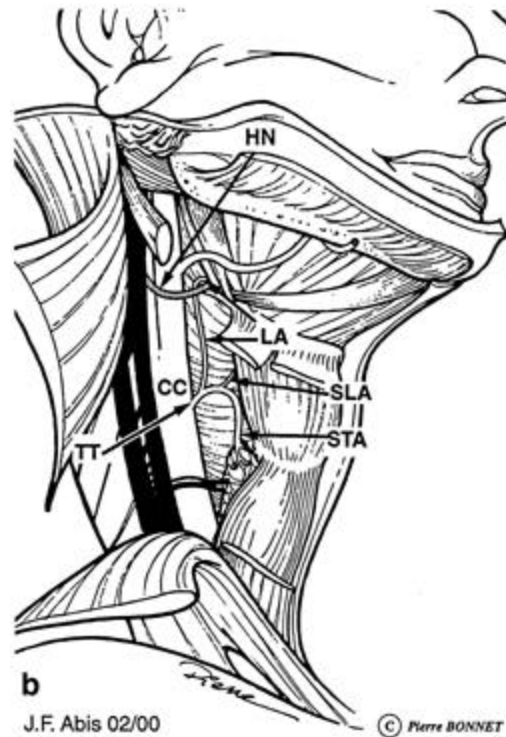
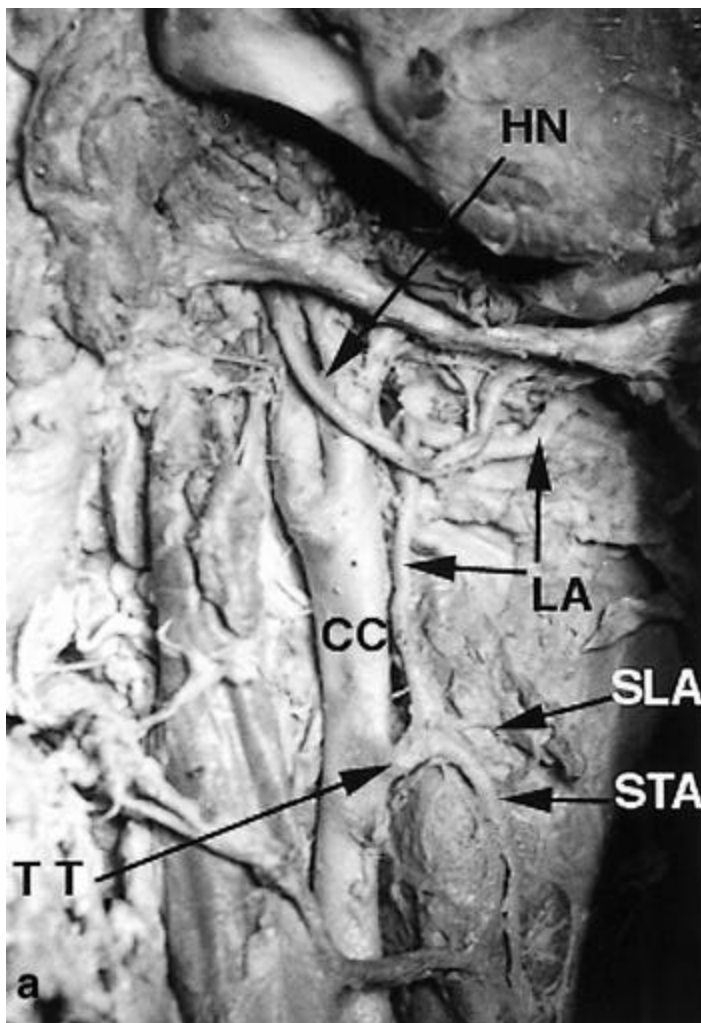
Abstract

During a cadaver dissection in the anatomy department of the University of Liege, Belgium, an anatomic variation of the superior thyroid and lingual arteries was observed on the right side in a 68-year-old woman. Both arteries arose from a common trunk located 30 mm beneath the carotid bifurcation. After a 5.2 mm course, the thyrolingual trunk divided into superior thyroid and lingual arteries which followed an unusual course towards their respective organs. Knowledge of this anomaly is important for those who are involved with neck surgery and anatomy.

Knowledge of the arterial variations in the neck region may be of great importance in the diagnosis and treatment of cervical pathologies. This report describes a rare variation concerning the superior thyroid and lingual aa.

Case report

During a neck dissection in a 68-year-old woman cadaver, a variation of the superior thyroid and lingual aa. was detected on the right side. Both arteries derived from a common trunk arising from the common carotid a. 30 mm below its bifurcation into external and internal carotid aa. (Fig. 1a, b). The bifurcation was located at a normal level, i.e. at the level of the posterosuperior angle of the thyroid cartilage. The thyrolingual trunk ran anteriorly and superiorly through a 5.2 mm distance before dividing into the superior thyroid and lingual aa. The superior thyroid a. gave off the superior laryngeal a. directly after its departure from the thyrolingual trunk. Then, it immediately reached the upper pole of the right lobe of the thyroid gland and divided classically within the gland. Coming from the common trunk, the lingual a. crossed the external aspect of the inferior pharyngeal constrictor m. along the anterior sheath of the common carotid a., with the superior laryngeal n. located deep to it at the level of the hyoid bone. Above the carotid bifurcation, it was crossed externally by the hypoglossal n. Then it passed under the anterior belly of the digastric m., crossed over the greater horn of the hyoid bone and entered the sublingual space, running under the hyoglossus m. The distance between its emergence from the common trunk and the point where it crossed the greater cornu of the hyoid was 54 mm.



Figs. 1a, b Right antero-lateral view of the neck, showing a thyrolingual trunk arising from the common carotid a. The mylohyoid and hyoglossus mm. have been removed to allow a better view of the studied area. **a** photo, **b** line drawing corresponding to a. *CC*, common carotid a. *HN*, hypoglossal n. *LA*, lingual a. *SLA*, superior laryngeal a. *STA*, superior thyroid a. *TT*, thyrolingual trunk.

The first branch of the external carotid a. was therefore the facial a., which started 44.6 mm above the thyrolingual trunk, eg, at the point where the origin of the lingual a. is normally located.

On the left side, the superior thyroid a. arose from the carotid bulb while the lingual a. had a classical origin from the external carotid a.

Discussion

Classically, the common carotid a. gives off no collateral branch. The superior thyroid a. is the first branch of the external carotid a. and originates just below the level of the greater cornu of the hyoid, then goes down towards the top of the lateral lobe of the thyroid gland [3]. The origin of the superior thyroid a. from the common carotid a. has been the subject of many reports (Table 1). The incidence of this anomaly is variable, ranging from 1% [2] to 18% [7] of cases. Nevertheless, there are only a few reports in the literature where the origin of the superior thyroid a. was located more than 25 mm below the bifurcation. Dubrueil in 1847 described a superior thyroid a. arising 27 mm under the carotid bifurcation [6]. Smith and Benton [20] found it at the same distance. Issing et al reported more recently a superior thyroid a. 35 mm below the bifurcation [10]. In the present case, the abnormal superior thyroid a. had a common trunk with the lingual a.

Author	Percentage
Quain	14,10%
Adachi	13,30%
Faller & Schärer	18%
Poysel & Golth	6,41%
Akyol et al	1%

Table 1. Frequency of origin of the superior thyroid a. from the common carotid a.

The lingual a. arises normally from the external carotid a. above the superior thyroid a., opposite the tip of the greater cornu of the hyoid [3]. A lingual a. originating from the common carotid a. is far less frequent, while an origin from the carotid bifurcation has already been reported [8, 16]. Kaneko et al described a case where the superior thyroid, lingual and facial aa. arose separately from the common carotid a. while the external carotid a. was absent [11]. In their study, they quote two similar cases previously reported by Kubota and by Matsumoto et al. Finally, two studies mentioned an ectopic origin of the lingual a. from the terminal part of the common carotid a. [4, 8].

Some rare previous reports have shown that the superior thyroid and lingual aa. can arise from a common trunk. Five cases of thyrolinguofacial trunk were reported in the literature [1, 5, 7, 15, 16]. Twenty-six cases of thyrolingual trunk were previously described [1, 7, 12, 16, 17, 18, 19, 23] (Fig. 2). However, only one of them, reported by Vuillième and Bruneton in 1932 [23], arose from the common carotid a., where it was 30 mm below the carotid bifurcation. The thyrolingual trunk was 10 mm long (compared to 5.2 mm in our case) and the superior laryngeal a. originated separately 10 mm below the carotid bifurcation (in our case, it originated from the beginning of the superior thyroid a.).

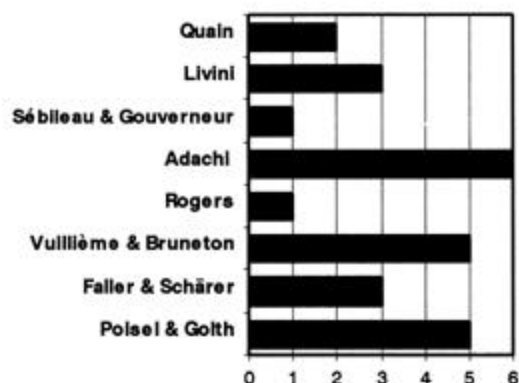


Fig. 2 Number of thyrolingual trunks reported by authors in the literature

During the embryonic period, the lingual a. springs out from the external carotid a. (12.5 mm long embryo) and runs towards the buccal region along with the hypoglossal n. [21]. The superior thyroid a. develops later from the carotid bifurcation but moves up to the external carotid a. during development [21]. Since the lingual and superior thyroid aa. have separate origins during development, the presence of a common trunk might be explained by an ectopic development of the superior thyroid a. springing from the lingual a. A thyrolingual trunk has not been reported in any other species, indicating it to be a specifically human formation [16].

Knowledge of this anomaly is especially important in surgical or chemotherapeutic treatments of tongue cancers. Indeed, chemotherapeutic treatments develop more and more towards superselective infusions into the lingual a. itself [22], making knowledge of this anatomical variation essential. As far as the surgical treatment is concerned, ie, mainly hemiglossectomy or total glossectomy, ligating the lingual a. is useful in order to avoid excessive bleeding. In the present case, a classical bimaxoid [9] or MacFee [13] incision would not allow a proper view of the lingual a. and, respectively, an inverted H-shaped [9] or a double Y [14] incision would be necessary in order to visualize the vessel. Awareness of this particular variation would also be useful in thyroid surgery since a persistent hemorrhage from the superior thyroid a. would not have been arrested by external carotid a. ligation in the present case.

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