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Case Report

Unilateral high origin of facial artery associated with a variant origin of the glandular branch to the submandibular gland

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Mohandas Rao KG ✦
Vincent RODRIGUES
Koshy SHAJAN
Narendiran KRISHNASAMY
Arul Moli RADHAKRISHNAN

Asian Institute of Medicine, Science and Technology, Semeling, Kedah, MALAYSIA.

✦ Mohandas Rao KG, PhD
Associate Professor of Anatomy
Asian Institute of Medicine, Science and Technology
Semeling, Bedong – 08100
Kedah, MALAYSIA.
☎ +60 016 4977261
✉ mohandaskg@gmail.com

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ABSTRACT

The variations in the carotid arteries and their branches are common in the anterior triangle of the neck. However, variations in the origin of facial artery and its branches given in the digastric triangle are not very common. A case of high origin of facial artery and abnormal origin of the glandular branch to submandibular gland encountered during routine dissection of anterior triangle of the neck is reported. The facial artery was arising from the external carotid artery deep in the digastric triangle and the glandular branch to submandibular gland was also arising from the external carotid artery about 1 cm below the origin of facial artery in the digastric triangle. Further, the surgical, importance of the case was discussed. © **IJAV. 2009; 2: 136–137.**

Key words [facial artery] [external carotid artery] [glandular branch to submandibular gland] [digastric triangle] [sialoadenectomy]

Introduction

It is important for surgeons and radiologists to be aware of the normal anatomy of common carotid and the external carotid arteries and their branches. Since, variations among these vessels are quite common, it becomes further more essential to know and report all the probable variations. Normally, common carotid artery gives 2 terminal branches, external and internal carotid arteries at the level of upper border of the thyroid cartilage in the carotid triangle. External carotid artery (ECA) then runs upwards passes deep to the posterior belly of digastric and enters the digastric triangle and later in to the parotid gland. In the carotid triangle, it normally gives five branches, namely superior thyroid, lingual, facial, ascending pharyngeal and occipital. In the digastric triangle it gives posterior auricular and further the 2 terminal branches maxillary and superficial temporal are given within the parotid gland. The facial artery (FA) normally passes from the carotid to digastric triangle deep to the posterior belly of digastric, there it grooves the submandibular gland then it passes between the gland and the mandible and reaches the face after winding around the base of the mandible. It gives ascending palatine, tonsillar, glandular branch/s to the submandibular gland and submental arteries in the neck [1].

Case Report

During the routine dissection for medical undergraduate teaching in the Department of Anatomy, Faculty of medicine, AIMST University, Malaysia, we encountered a case of high origin of facial artery along with variant origin of the glandular branch for submandibular gland from the ECA. The facial artery was originating from the ECA about 2 cm above the level of posterior belly of digastric in the deeper part of digastric triangle. The artery then passed between the submandibular gland and the inner surface of the body of the mandible without grooving the gland. It gave a submental branch before entering to the face. The glandular branch to the submandibular gland is usually a branch of the facial artery. However, in this case it was arising from the ECA about 1 cm below the origin of facial artery. The glandular artery passed horizontally forwards to enter into the posterior end of superficial part of the submandibular gland (Figure 1). These variations were observed in the left digastric triangle of the neck in about 60-year-old male cadaver. However, arterial branching pattern on the right side was as usual.

Discussion

Since carotid arteries and their branches exhibit a high range of variations, a number of studies have been carried out on these arteries and a wide range of variations has been reported. As far as facial artery variations are concerned, most of the studies are conducted on its branching pattern in the face [2–6]. There are a very few studies conducted and reported on its origin and its branches in the neck. In a study on front branches of ECA, Ozgur et al. have observed that in 90% cases the 3

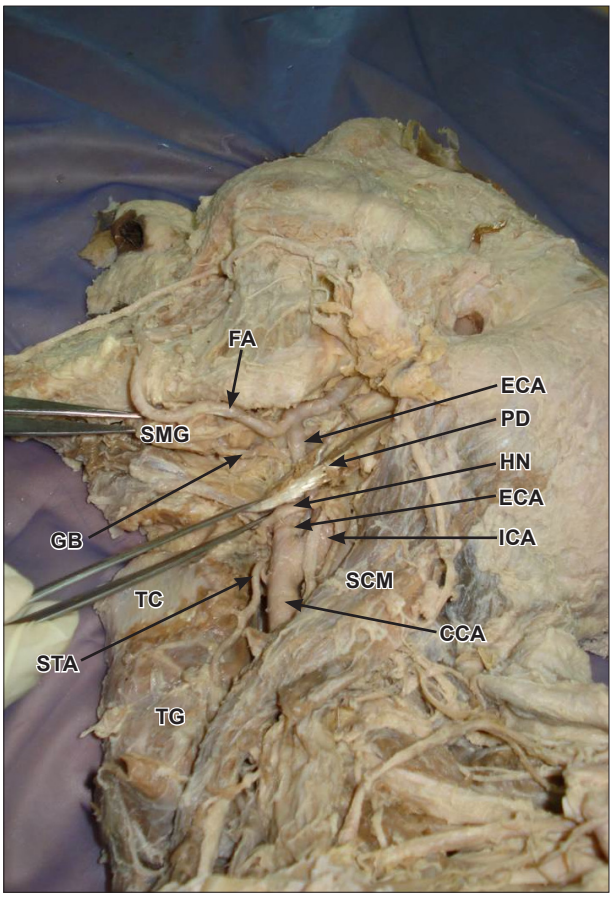

Figure 1. Dissection of the digastric triangle of the neck illustrating the external carotid artery and its branches. Note that facial artery is arising from the external carotid artery above the posterior belly of digastric that is in the digastric triangle instead of carotid triangle. Similarly, the glandular branch to the submandibular gland is originating from the external carotid artery instead of facial artery. *(**FA:** facial artery; **ECA:** external carotid artery; **PD:** posterior belly of digastric; **GB:** glandular branch to submandibular gland; **SMG:** submandibular gland; **TC:** thyroid cartilage; **STA:** superior thyroid artery; **TG:** thyroid gland; **CCA:** common carotid artery; **SCM:** sternocleidomastoid; **ICA:** internal carotid artery; **HN:** hypoglossal nerve)*

front branches, superior thyroid, facial and lingual arose separately from ECA and the distance from the carotid bifurcation to the origin of the FA is about 21 mm [7]. It can be noted here that in the case presented here the facial artery was given off by the ECA about 50 mm distal to the carotid bifurcation. A study conducted on the distribution of the ECA trunks in human fetuses showed linguofacial trunk in 20%, thyrolingual trunk in 2.5%, a thyrolinguofacial trunk in 2.5% and an occipitoauricular trunk in 12.5% of the cases [8]. There is also a report on unilateral agenesis of facial artery compensated by the giant transverse facial artery [9]. A case reported by Chakravarthy et al. found to be partially similar to what we have observed where FA originated above the greater horn of hyoid bone [10]. One case of origin of the facial artery as high as in the parotid gland is also been reported [11]. However, regarding FA branches given before it enters the face that is in the neck, not much literature is available.

A profound knowledge of the anatomical characteristics and variations of the carotid artery such as its branching pattern and its position is essential to avoid complications with catheter insertion of carotid arteries in various procedures [12]. The neck region has a great vital value; its variations and known micrometric values are accepted as important orientation points during surgical intervention [7]. Hence it is essential to know the possible variations and minor details about the branches of ECA in the neck. Knowledge of possible variations in the origin and course of glandular branch and its relation ship to the gland is very essential during submandibular gland sialoadenectomy through trans-cervical approach. In addition, high origin of facial artery is also a case to be noted during parotid surgeries.

To conclude, we would like to state that though the other variations in the external carotid artery and its branches are common, high origin of facial artery and branching of glandular branch for submandibular gland from the external carotid artery is rare. Noting these variations may be beneficial during submandibular and parotid gland surgeries.

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