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Short Report:

Anatomical Variations in the Arteries and Nerves of the Right Carotid Triangle.

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Abstract: Variations of the arteries and nerves are of clinical importance to the clinicians and surgeons in performing the surgeries. During the routine dissection for the undergraduates, variation in the branches of external carotid artery was noted in the right carotid triangle. The superior thyroid artery showed an upward loop from its origin and had a highly tortuous course, the lingual and facial arteries arouse from a common linguo-facial trunk and the ascending pharyngeal artery took origin from the Internal carotid artery. The ansa cervicalis showed absence of inferior root. The second and third cervical spinal nerves joined the superior root separately.
Key Words: Ansa cervicalis, Ascending pharyngeal artery, Linguo-facial trunk, Superior thyroid artery, Variations.

Introduction:
The Superior thyroid artery (STA) is the first branch of External carotid artery given off from its anterior aspect, just below the level of the greater cornu of hyoid bone. This artery runs along the lateral border of thyrohyoid muscle to reach the apex of the lobe of thyroid gland, thus furnishing the arterial supply to the gland.(1)
The lingual and facial arteries are also given off from the anterior aspect of the External carotid artery above the origin of Superior thyroid artery. The lingual artery is divided into three parts by the hyoglossus muscle. The first part exhibits a characteristic loop and finally supplies the tongue. The facial artery has a sinuous course in the submandibular region and enters the face to supply it. This type of finding is seen in literature.(1)
The ascending pharyngeal artery (APA) is given off from the medial side of the External carotid artery. It is a short branch which immediately enters the pharynx to supply it.(1)
The ansa cervicalis is a loop of nerves in the carotid triangle, formed by the cervical plexus. It has two roots – superior root (descendens hypoglossi) and inferior root (descendens cervicalis). The superior root is formed by the fibres of first cervical spinal nerve (C1) and the inferior root is formed by the union of the fibres of second (C2) and third (C3) cervical spinal nerves. The branches from the ansa cervicalis supply the infrahyoid muscles.(1)

Case Report:
During the routine dissection class for the undergraduates, the following variations were noted unilaterally, in the right carotid triangle of a 65-years-old male cadaver.

1. Looped course of the Superior thyroid artery – The STA showed an upward loop and descended along the lateral border of thyrohyoid muscle in a highly tortuous manner. It then lied superficial to the thyrohyoid muscle, appeared close to the apex of the lobe of the thyroid gland to supply it (Figure 1).
2. Presence of Linguo-facial trunk – The lingual and facial arteries arose from a common linguo-facial trunk. The trunk measured 1.3 cms in length. This trunk then bifurcated into a facial artery above and a lingual artery below. The characteristic loop of the first part of lingual artery was absent. The rest of the course of both arteries was normal (Figure 1).
3. Ascending pharyngeal artery arising from the Internal carotid artery – The APA is given off from the anteromedial aspect of the Internal carotid artery, about 2.8 cms from the bifurcation of Common carotid artery (Figure 1).
4. Presence of dual ansa cervicalis – The C2 and C3 joined the superior root separately in front of the carotid sheet (Figure 1).

Figure 1: Right carotid triangle. 1 – External carotid artery, 2 – Internal carotid artery, 3 – Superior thyroid artery, 4 – Linguo-facial trunk, 5 – Ascending pharyngeal artery, 6 – C2 of ansa cervicalis, 7 – C3 of ansa cervicalis, 8 – Superior root of ansa cervicalis.

Discussion

Multiple variations in a single case are worthy to be noted.

1. Looped course of the Superior thyroid artery – Many previous authors have studied the clinically relevant variations of STA. The origin, diameter, branching pattern and the length of the main trunk have been noted by many previous authors.(2-3) In the present case, the STA originated from the External carotid artery (Figure 1). Studies suggesting the looped and tortuous course of STA are lacking.
2. Presence of Linguo-facial trunk – According to a study conducted by Lucey et al., and Lappas et al., 20% and 14% cases showed the presence of Linguo-facial trunk.(4,5) Ozgur found a similar case in 7.5% of cases.(3) A similar finding is observed in the present case (Figure 1).
3. Ascending pharyngeal artery arising from the Internal carotid artery – Bergman et al., found that nearly 6% of the cases showed the origin of APA from Internal carotid artery.(6) Similar finding is seen in our case (Figure 1). In some cases, APA was seen to arise from the bifurcation of common carotid artery (7), as a common trunk along with occipital artery.(8,9)
4. Presence of dual ansa cervicalis – C2 and C3 joining the superior root has been reported by Babu and Quadros et al.(10,11) The present case reports a similar finding (Figure 1).

Knowledge of variations of the External carotid artery and its branches and their recognition during diagnostic imaging are important for vascular surgical procedures in the region, such as carotid endoplasty for the treatment of carotid stenosis or extracranial-intracranial arterial bypass for the treatment of patients with occlusive cerebrovascular disease, skull-base tumors or aneurysms.(12) These variations may aid the radiologists in image interpretation of the neck region, alert the surgeons while performing the surgeries and also create academic interest to the anatomists.

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