VARIATION IN ORIGIN OF SUPERIOR THYROID ARTERY AND ITS CLINICAL RELEVANCE: A CASE REPORT

Anatomy

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ABSTRACT

Thyroid surgeries are most common neck surgeries; hence thorough knowledge of the variations in blood supply of this gland to the surgeons is very important to prevent any alarming hemorrhage or iatrogenic damage. We found a variation in origin of superior thyroid artery on right side during routine dissection on an adult male cadaver in the Department of Anatomy, A.I.I.M.S, New Delhi. Left superior thyroid artery was normal. Right side, superior thyroid artery was arising from common carotid artery instead of external carotid artery, just proximal to the bifurcation of common carotid artery. This variant branching pattern of superior thyroid artery is very rare. The inferior thyroid arteries did not show any unusual origin. Knowledge of such arterial variations related to the thyroid gland is immensely helpful to the surgeons to avoid damage of the vital organs in this region.

KEYWORDS

Surgical anatomy, Thyroid gland, Variations

Case Report

During the routine dissection, the unilateral variation in origin of right superior thyroid artery was found in an adult male cadaver. Skin and fascia were dissected to view the contents of the anterior triangle of the neck. Muscles were retracted. In Right side, superior thyroid artery was arising from common carotid artery instead of external carotid artery, just proximal to the bifurcation of common carotid artery. Rest of the branches from external artery carotid was arising from external carotid only except superior thyroid artery (FIG-1).

Studies indicate that in 20-45% of cases, the superior parathyroid glands also receive significant vascular supply from the superior thyroid artery. Thus knowledge of variant vasculature of thyroid gland and superior parathyroid glands is of immense importance for some surgical procedures such as radical neck dissection, reconstruction of aneurysm and interventional radiology.

FIG-1 : Dissected neck showing origin of superior thyroid artery from CCA.

DISCUSSION

Vascular supply of the thyroid gland is of immense importance to the clinicians dealing with the neck region. Variations in the thyroid vasculature are frequently documented in classical anatomical, surgical and radiological text books. The superior thyroid artery is the main source of Blood supply to the thyroid gland, upper part of the

larynx and neck region. It arises from anterior surface of external artery carotid just below the level of greater cornu of the hyoid bone. It descends along the lateral border of thyrohyoid to reach the apex of the lobe of the thyroid gland. Occasionally it may issue directly from the common carotid artery¹. The superior thyroid artery has the following named branches: infrahyoid, superior laryngeal, sternocleidomastoid and cricothyroid. The present case, superior thyroid artery was arising from common carotid artery instead of external carotid artery, just proximal to the bifurcation of common carotid artery in Right side. In an Indian study by Anitha et al., superior thyroid artery origin from CCA bifurcation was noted in 19% of cases².

Pankaj Gupta et al.³, in an angiographic study categorized the branching patterns of superior thyroid artery into three types: Type I (bifurcation), type II (trifurcation), and type III (non-bifurcation, non-trifurcation). Type I pattern was defined as the one in which the superior thyroid artery divided to give two major branches with rest of the branches arising from these branches. Similarly, type II pattern was said to be present when the superior thyroid artery gave three major branches. In type III pattern, there was random origin of the branches, not conforming to either of the former two patterns. Ozgur et al., classified superior thyroid superior thyroid artery into six types depending on the branching pattern⁴. Hu et al., reported similar branching pattern⁵. Thus, we report a very rare unilateral variation in origin of superior thyroid artery as it emerged from common carotid artery. The variations might be related to changes in the transformation of the aortic arch system in the embryo. The External carotid artery and its branches are formed after a complicated process of angiogenesis⁶. It includes annexation and regression of the vessels with some remodelling. Deviation in the normal stages of annexation and regression during angiogenesis leads to the anomalous structures⁷. Knowledge of surgical anatomy of the superior thyroid artery ensures maintaining a bloodless field during major radical neck dissection surgeries to minimize postoperative complications.

CONCLUSION

Profound knowledge of the anatomy and variations of superior thyroid artery is of immense importance for clinicians to avoid iatrogenic injuries and postoperative complications in various procedures such as radical neck dissection, thyroidectomy, and reconstruction of aneurysm and intervention radiology. Description of arterial and venous variations, especially if they are of rare occurrence is important for interpretation within the scope of modern imaging techniques. Knowledge of this variation would be helpful for the clinicians planning surgeries in this region to minimize the complications.

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