ORIGINAL RESEARCH PAPER

General Surgery

ARTERIAL VARIATIONS OF THYROID GLAND WHILE PERFORMING THYREDECTOMY

KEY WORDS: Artery, Variations, Thyroid Gland.

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ABSTRACT

Knowledge of the arterial variations is the key for the success of surgeries when it matters the most. This study puts in an effort to find the Arterial variations of thyroid gland in females so as to find if there are deviations from the normal population and also provides us with a useful data for the operating surgeons. The clinical implications of the study are vast.

INTRODUCTION

The **thyroid gland**, or simply the **thyroid**, is an endocrine gland in the neck, consisting of two lobes connected by an isthmus. It is found at the front of the neck, below the Adam's apple. The thyroid gland secretes three hormones, namely the two thyroid hormones (thyroxine/T_4 and triiodothyronine/T_3), and calcitonin. The thyroid hormones primarily influence the metabolic rate and protein synthesis, but they also have many other effects, including effects on development. Calcitonin plays a role in calcium homeostasis.[1]

Hormonal output from the thyroid is regulated by thyroid-stimulating hormone (TSH) secreted from the anterior pituitary gland, which itself is regulated by thyrotropin-releasing hormone (TRH) produced by the hypothalamus.[2]

The thyroid may be affected by several diseases. Hyperthyroidism occurs when the gland produces excessive amounts of thyroid hormones, the most common cause being Graves' disease, an autoimmune disorder. In contrast, hypothyroidism is a state of insufficient thyroid hormone production. Worldwide, the most common cause is iodine deficiency. Thyroid hormones are important for development, and hypothyroidism secondary to iodine deficiency remains the leading cause of preventable intellectual disability.[3] In iodine-sufficient regions, the most common cause of hypothyroidism is Hashimoto's thyroiditis, also an autoimmune disorder. In addition, the thyroid gland may also develop several types of nodules and thyroid cancer.

Aim and objectives of the study

To study the length and origin of superior and inferior thyroid arteries and To study the variations of inferior thyroid artery with relation to recurrent laryngeal nerve

MATERIALS AND METHODS

This descriptive study was done on 30 patients collected during a period of 3 years, at the department of Surgery, Kanachur Institute of Medical Sciences, Mangalore.

The sternocleidomastoid muscle has displaced laterally. To expose thyroid gland the infrahyoid muscles has reflected. After exposing thyroid gland the fascia has removed from the lobes of the thyroid exposing its arteries and veins. All the arteries of the thyroid gland had exposed and observations were documented. The lower part of the gland has lifted up to expose the lateral surfaces of trachea and oesophagus with recurrent laryngeal nerve in the groove between them along with the inferior thyroid artery .Relationship between inferior thyroid artery and recurrent laryngeal nerve has observed.

The data was collected after getting approval from institutional ethics committee.

RESULT

It is observed that superior thyroid artery (STA) was present in all the patients. STA was taking origin from the external carotid artery (ECA) in 19 patients on the right side. On the left side it was taking origin from ECA in 11 patients.

STA was taking origin from carotid bifurcation in 7 cases on the right side. On the left side it was arising from carotid bifurcation in 5 cases. It was also found that in 1 case STA was taking origin from common carotid artery (CCA).

Relation of recurrent laryngeal nerve (RLN) with inferior thyroid artery (ITA)

It was observed that RLN was posterior to the ITA in 80% on the right side. On the left side RLN was posterior to the ITA in 90%. The recurrent laryngeal nerve was anterior to the ITA in 10% on the right side. In 10 % RLN was anterior to the ITA on the left side.

The recurrent laryngeal nerve was passing through the branches of ITA in 10% on the right side and on the nil on the left side.

DISCUSSION

Meta-analysis conducted by Toni et al. to investigate whether the presence, numerical variations and site of origin of the superior thyroid artery (STA) are influenced by the ethnic group and gender has revealed a higher frequency of its origin from the external carotid artery in Caucasoid than in East Asians. No gender differences were found in East Asians.

An author[5] conducted study on 46 cadavers (36 males and 10 females). They undertook dissection of neck region bilaterally to expose the origin of the superior thyroid artery. It originated from the external carotid artery common carotid artery and linguo-facial trunk in 80%, 13% and 6.5% of the cadavers respectively on the right side. All but one of the superior thyroid arteries were ventral branches. There was asymmetric origin in 6.5% of cases .

An author[6] studied the anatomy of the superior thyroid artery in 50 formalin preserved cadavers between the ages of 60 to 80 years. The location of the origin of the superior thyroid artery according to common carotid artery was evaluated as above the bifurcation of common carotid artery 77 %(right-43 and left-34), at same level the bifurcation of common carotid artery 23% (Rt-7 & Lt-16) and below the bifurcation of common carotid artery (0%).

An author[7] (2015) dissected 40 cadavers ,the mean length of STA was found to be 4.38±1.42cm with right being 4.48±1.53cm and left being4.23±1.30cm.they also observed that STA was arising predominantly from ECA.

An author[8] observed the origin of inferior thyroid artery, its length from origin, distance from midline to entry of artery to gland in 50 cadavers. The mean + SD length on the right side

was 5.3840±0.216 cm and on the left side was 5.7640±0.237 cm.

Unpaired Student's 't' test was Applied and Statistically significant variation ($p<0.001$) of mean length of inferior thyroid artery between the right and left side of cadaver was found, indicating mean length was more on left side.

CONCLUSION:

We are in agreement with the other similar studies that were compared with but there was not even a single study where they concentrated on only the female cadavers.

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