

Arterial Variations of Thyroid Gland in Females - A Cadaveric Study

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Abstract

The numbers of female that suffer from thyroid diseases are vast. But the question of the hour is whether there are any arterial variations in the female population of the costal population. The Thyroid gland is richly supplied by the blood vessels. In fact according to some studies its blood supply can be compared to that of the kidneys. 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.

Keywords: Artery, Variations, Thyroid Gland.

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INTRODUCTION

India being a tropical country faces the problem of vast amount of land that is away from rich mineral content that is useful in normal thyroid functioning. The numbers of female that suffer from thyroid diseases are vast. But the question of the hour is whether there are any arterial variations in the female population of the costal population.

Knowledge of arterial variations of thyroid gland is helpful to surgeons to minimize the complications during thyroidectomy. The thyroid gland is highly vascular endocrine gland which is supplied by a pair of superior thyroid artery and inferior thyroid arteries. The gland also gets blood supply from thyroidea ima artery which is occasionally present. The superior thyroid artery (STA) and inferior thyroid artery (ITA) are also important because of their close proximity with the important nerves i.e external laryngeal nerve (ELN) and recurrent laryngeal nerve (RLN) respectively. Thorough anatomical knowledge about the arteries and nerves related to them are beneficial for surgeons performing thyroidectomy and head and neck surgeries. 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.

Aim and objectives of the study

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

MATERIALS AND METHODS

This descriptive study was done on 30 embalmed adult female cadavers collected during a period of 3 years, at the department of anatomy, Yenepoya medical college Mangalore.

The dissection of the neck has done according to methods described in the Cunningham's manual Vol; 03. After removing the skin, platysma (subcutaneous muscle of the neck) and deep fascia of the neck was removed. 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 specimens. STA was taking origin from the external carotid artery (ECA) in 23 specimens on the right side. On the left side it was taking origin from ECA in 24 specimens.

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).

The mean length of STA was found on right side was 39.5 ± 2.9 and on the left side 39.6 ± 2.7 mm.

The inferior thyroid artery (ITA) was arising from thyro cervical trunk in all the specimens.

The mean length of ITA was found on right side was 51.2 ± 2.9 and on the left side 50.2 ± 3.4 mm.

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.*, [1] 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.

Ongeti *et al.*, [2] 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.

Jitendra P Patel *et al.*, [3] 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%).

Shailaja shetty *et al.*, [4] dissected 40 cadavers, the mean length of STA was found to be 4.38 ± 1.42 cm with right being 4.48 ± 1.53 cm and left being 4.23 ± 1.30 cm. they also observed that STA was arising predominantly from ECA.

Roshan *et al.*, [5] 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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