

## ABSENCE OF ISTHMUS AND LEFT INFERIOR THYROID ARTERY- A CASE REPORT

**Dr. G. Praveen kumar**

Associate professor Department of Anatomy, Meenakshi Medical College and Research Institute, Enathur, Kanchipuram, Tamil Nadu, 631 552, India.

### ABSTRACT

In routine dissection classes in the Department of Anatomy a male cadaver showed the absence of Isthmus or Median lobe of the thyroid gland. In the same cadaver left inferior thyroid artery was absent. In addition, a pyramidal lobe and levator glandulae thyroideae was also seen arising from the right lobe. The Isthmus connects the two lateral lobes of the thyroid gland and lies over the second, third and fourth tracheal rings. In the present cadaver it was absent. The inferior thyroid artery commonly arises from the thyrocervical trunk, passes posterior to the carotid sheath and supplies the inferior pole of the corresponding lobe of the thyroid gland, its branches can course anterior or posterior to or between the branches of the recurrent laryngeal nerve. In the present cadaver the inferior thyroid artery on the left side was absent. The left superior thyroid artery arose from external carotid artery and ramified over whole of the left lobe of the thyroid gland to supply it.

The pyramidal lobe of the thyroid gland is the remnant of caudal end of the thyroglossal duct and in the present cadaver it arose from the right lobe of the thyroid gland.

**KEYWORDS :** Isthmus, Inferior Thyroid Artery, Right Lobe, Thyrocervical Trunk, thyroglossal Duct

### INTRODUCTION:

Thyroid gland an Endocrine gland with rich in vascular, situated in the neck anteriorly placed from cervical 5th vertebra to thoracic 1st vertebrae, which is enclosed by pretracheal layer of deep cervical fascia. The thyroid gland has been designed with two lateral lobes with an Isthmus which connects both lobes these lobes are conical in shape with an average of 5 cm long and the isthmus measures about 1.25 cm and occupies the second and third cartilages. The Inferior thyroid artery commonly arises from the thyrocervical trunk, passes posterior to the carotid sheath and supplies the inferior pole of the corresponding lobe of the thyroid gland, its branches can course anterior or posterior to or between the branches of the recurrent laryngeal nerve. The left superior thyroid artery arose from external carotid artery and ramified over whole of the left lobe of the thyroid gland to supply it.

As this gland is considered as first endocrine gland to develop so various anomalies during development are considered, the pyramidal lobe and thyroglossal duct are the commonest anomalies



**FIG 1** Shows the absence of Isthmus, pyramidal lobe and levator glandulae thyroideae seen arising from the right lobe

### DISCUSSION

**ISTHMUS:** Variations in the morphology of thyroid gland in children was reported as early as 1895 by Marshall<sup>1</sup>. He reported about 60 cases which were apparently abnormal. In more cases, one lobe is markedly larger than the other. In six cases (10%) isthmus was entirely absent. The absence of Isthmus of the thyroid gland was also reported in 1952 by Allan<sup>2</sup>. He states that isthmus was absent in 2 to 4% of cases. The variations in the size, shape and relative level of the thyroid gland was reported by Anson<sup>3</sup> in 1996. He states that isthmus was absent in 6 to 8% of cases.

**INFERIOR THYROID ARTERY:** Sherman<sup>4</sup> JH 2000 reported a case of

absence of the left inferior thyroid artery, its usual area of distribution to the gland was supplied by the right inferior thyroid artery. Absence of the left inferior thyroid artery occurs in 1 to 6% of cases. Jele VL<sup>5</sup>, surchev 2001 reported a case of absence of right inferior thyroid artery. Amongst the most impressive findings is lack of right inferior thyroid artery combined with abnormal ramification of the right superior thyroid artery. Poyraz<sup>6</sup> H 2002, made a study on blood supply of thyroid gland and found that inferior thyroid artery was missing bilaterally in one cadaver and unilaterally in 2 cadavers. Faysal, Jihaad<sup>7</sup> 2004 reported a case of absence of left inferior thyroid artery and its usual area of distribution came from arteria thyroideae ima arising from the brachiocephalic trunk.

**Pyramidal Lobe:** Anson and Mcvay<sup>8</sup> 1984 described that there are many variations in size, shape and relative level of the gland. A vertical cephalic prolongation of the thyroid gland known as the pyramidal lobe is a common finding. It may arise from isthmus or superior pole of the lateral lobe and commonly extends to the hyoid bone where it is attached by a firm fibrous strip. The presence of pyramidal process was also found in 43% cases by Marshall<sup>9</sup> in 1975. Often pyramidal process was found connected to the isthmus and to one of the other lobes.

**Levator Glandulae Thyroideae:** Elsler<sup>10</sup> 1922 has made an extensive study on the levator glandulae thyroideae and its innervations, the levators of the thyroid gland are divisible into three groups the anterior, lateral and posterior levators derived from cricothyroid, infrahyoid and inferior constrictor muscle of pharynx. Allan<sup>11</sup> observed that a band of connective tissue named levator glandulae thyroideae extended from the apex of right or left lobe or isthmus of the thyroid gland to the hyoid bone.

**CONCLUSION:** Thyroid hemiagenesis<sup>12</sup> is a rare embryological anomaly in which one lobe of the thyroid along with isthmus fails to develop. Most of the patients diagnosed have associated thyroid diseases which include benign adenoma, multinodular goitre, hyperthyroidism, chronic thyroiditis and rarely carcinoma. The commonest pathology involved in thyroid hemiagenesis is hyperthyroidism.<sup>13</sup> The diagnosis of thyroid hemiagenesis should be considered in any patients where on physical examination, no apparent thyroid tissue is noted on one side of the neck. Sonography demonstrates an absent lobe or an absent isthmus and eventually co-existing pathological condition in the remaining thyroid tissue.<sup>14</sup> Congenital Hypothyroidism is most frequently caused by thyroid developmental abnormalities and found that it has a familial component. A segregation analysis led to the conclusion with an autosomal dominant mode of inheritance.

Lack of any individual artery in either Caucasians or Asians might influence the distribution of autonomic supply that runs with

thyroid vessels to the thyroid parenchyma<sup>15</sup>. This appears functionally relevant in cases of traumatic or surgical lesions of the cervical sympathetic chain involving thyroid nerves.<sup>15</sup> During thyroid surgery it is imperative to identify the relationship of the inferior thyroid artery to the recurrent laryngeal nerve or to establish its absence because injury to the nerve can be a major complication. Significant variations of the surgical anatomy of the thyroid gland are important for preserving the important structures.

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