Journal of Morphological Sciences
J Morphol Sci
Brazilian Society of Anatomy

Case Report
J Morphol Sci 2025;42:155-156

Absence of Isthmus of Thyroid Gland in Adult Female Cadaver - A Case Report

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Disclose and conflicts of interest: none to be declared by all authors

ABSTRACT

Introduction: Thyroid gland is a brownish red, H-shaped highly vascular largest endocrine gland located in the lower front and side of the neck, extending from C5, C6, C7 and T1 vertebrae, secreting T3, T4 and Calcitonin. During the routine dissection for 1st year MBBS students in the Department of Anatomy, JSS Medical College, an absence of isthmus in a 58 years old-female cadaver was observed. However, the cadaver had both the lateral lobes and on observation the lateral lobes were present in the normal position and supplied by superior and inferior thyroid arteries branching from external carotid and thyrocervical trunk. During the 3rd week of intrauterine life, thickening of the thyroglossal duct in the floor of pharynx behind the tuberculum impar and descends in front of the neck and passes in front of hyoid bone. Understanding of thyroid gland variations helps the surgeons during tracheostomy, thyroidectomy. To avoid the misdiagnosis of agenesis of isthmus of thyroid, ultrasonography, scintigraphy can be used.

Keywords: Thyroid Gland; Absence of isthmus; lateral lobes; Thyroidectomy.

Introduction

Thyroid gland is a brownish red, H-shaped highly vascular largest endocrine gland located in the lower front and side of the neck, extending from C5, C6, C7 and T1 vertebrae, secreting T3, T4 and Calcitonin. It normally weighs about 25gm, measuring 5 cm long (each lobe), 3 cm wide, 2 cm thick and isthmus measuring 1.25 cm transversely and vertically connecting the two lateral lobes. Pre-tracheal fascia splitting and encloses the thyroid gland forming false capsule[1,2].

Thyroid gland with anomalies, agenesis has clinical implications and functional disorders[2]. however, agenesis of isthmus had no clinical symptoms to manifest and often mistaken for thyroid pathologies[3].

Case Report

During the routine dissection for 1st year MBBS students in the Department of Anatomy, JSS Medical College, an absence of isthmus in a 58 years old-female cadaver was observed. However, the cadaver had both the lateral lobes and on observation the lateral lobes were present in the normal position and supplied by superior and inferior thyroid arteries branching from external carotid and thyrocervical trunk. Also, nerve supply to both the lateral lobes appeared to be normal. Right lateral lobe measured 5.4 cm and left lateral lobe measured 5.1 cm. No sign of thyroidectomy is observed before the dissection.

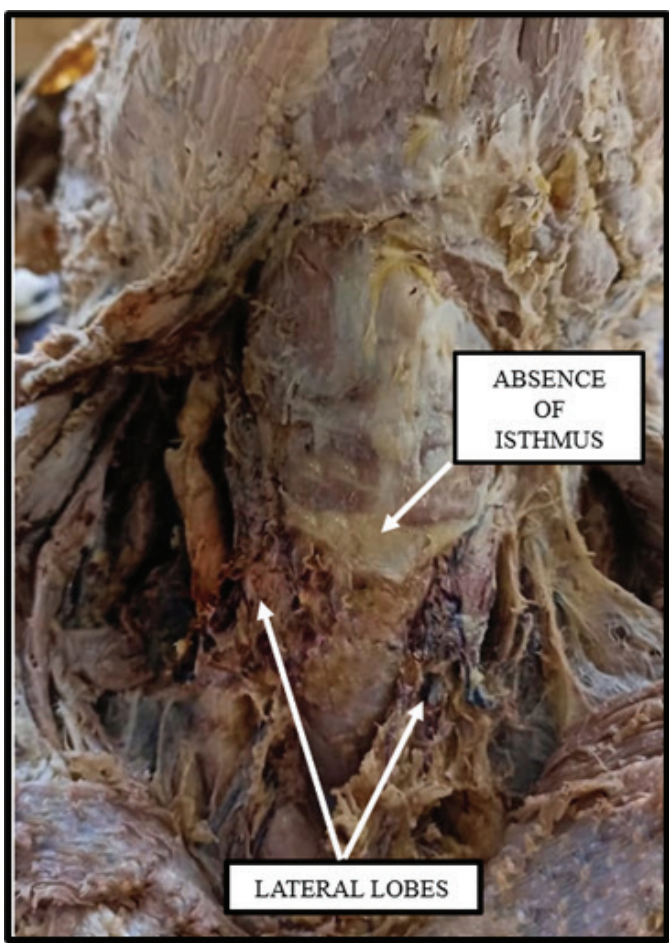

Figure 1. Absence of Isthmus in 58 - year - old female cadaver. The lateral lobes are seen in normal anatomical position. Image source: Department of Anatomy JSS medical college, Mysuru.

DOI: 10.51929/jms.42.155.2025
ISSN 2177-0298

Discussion

During the 3rd week of intrauterine life, thickening of the thyroglossal duct in the floor of pharynx behind the tuberculum impar and descends in front of the neck and passes in front of hyoid bone. By the 7th week it reaches in front of trachea and by bifurcating it forms two thyroid lobes connected by a median lobe called isthmus. Anomalous development of thyroglossal duct due to its fusion in the midline, it causes the formation of two independent lateral lobes and the absence of isthmus. The genes responsible for this condition is TITF1-2 genes[1,4]. Various investigators, have found clinical implications of the following condition as follows.

Omer Faruk Ozkan Mehmet Asik *et al* reported loss of weight, myalgia, shortness of breath, palpitation in a 41 years - old woman and on physical examination revealed tachycardia, diffuse palpable goitre. Later, in surgery they confirmed agenesis of isthmus[5].

The incidence of agenesis of isthmus is observed between 5 – 10% in gross specimens reported in north west part of India[4].

Ranade A V and Rai R studied 105 thyroid gland (88 male and 17 female) out of which 33% of specimens revealed agenesis of isthmus and accessory thyroid tissue is observed in one of the cadavers[6].

Devi Sankar K and Sharmila Bhanu P also reported thyroid gland with two separate lobes with complete agenesis of isthmus. No accessory thyroid artery or tissue is observed in their study[7].

Duh QY and Ciulla TA reported one patient with agenesis of isthmus and other one had left thyroid lobe hemi-agenesis. A subtotal parathyroidectomy was performed due to the parathyroid hyperplasia in both the patients[8].

Conclusion

Understanding the variations of the thyroid gland helps the surgeons during tracheostomy, thyroidectomy. To avoid the misdiagnosis of agenesis of isthmus of thyroid, ultrasonography, scintigraphy can be used. Generally, absence of isthmus is misdiagnosed as thyroiditis, carcinoma, metastasis.

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Received: December 4, 2025
Accepted: December 17, 2025

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