



Agenesis of Thyroid Isthmus Associated with Thyroid Papillary Carcinoma: A Rare Case

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Abstract

Anatomical anomalies of the thyroid gland are very important for the management of thyroidectomy operations. The thyroid gland consists of two lobes and the isthmus connecting them. The absence of the isthmus of the thyroid gland is defined as thyroid isthmus agenesis and very few cases have been reported in the literature. In the present case, isthmus agenesis was detected during thyroidectomy operation performed due to suspicion of malignancy. Caution should be exercised in terms of possible complications during thyroid surgery in cases with TIA and it should be kept in mind that different anomalies may accompany.

Keywords: Anatomical Anomaly; Thyroid Isthmus Agenesis; Thyroidectomy

Introduction

The thyroid gland is an endocrine gland located in the midline of the neck, consisting of two lobes and the isthmus connecting them. The thyroid gland has important functions on growth, regulation of metabolism and electrolyte balance. Various variations such as hypoplasia, hemiagenesis, ectopia have been described in the literature about the thyroid isthmus. Although agenesis of the thyroid isthmus is found between 3%-10% in clinical and cadaveric studies, few cases have been published in the literature. In this article, we present a case of agenesis of the thyroid isthmus found during thyroid surgery [1, 2].

Case Report

The patient, a 40-year-old woman, presented to our clinic with the complaint of swelling in the neck for about 2 years. On physical examination, there was a palpable nodule in the right lobe of the thyroid. Thyroid ultrasonography showed isoechoic solid nodules measuring 21x20x15 mm in the right lobe and 20x11x15 mm in the left lobe. Fine needle aspiration biopsy performed twice at 3-month intervals from the dominant nodule was reported as atypia of uncertain significance. Thyroid hormone level was found to be euthyroid in blood tests. Surgical treatment was recommended to the patient because of progressive increase in the diameter of the dominant nodule in ultrasonographic follow-up. Bilateral total thyroidectomy was planned. Total thyroidectomy was performed under general anaesthesia using intraoperative nerve monitoring. During surgical exploration, it was found that there was no thyroid isthmus, both thyroid lobes were independent from each other and extended laterally. The trachea was clearly seen in the midline (Figure 1).

After total thyroidectomy, a 2 cm nodule was found in the right lobe and a 1 cm nodule in the left lobe. The pathology picture of both lobes were taken (Figure 2).

The pathology result showed a 0.2 cm diameter papillary thyroid microcarcinoma in the right lobe thyroid nodule. Left lobe was reported as lymphocytic thyroiditis. The microscopic picture were taken (Figure 3).

Discussion

Thyroid isthmus agenesis (TIA) is the complete and congenital absence of the thyroid isthmus as defined by Pastor et al. Absence of the isthmus can be explained as an embryological developmental anomaly. It has been reported to be associated with genetic factors, chromosome 22 and TITF 1-2 gene mutations [2, 3]. Thyroid isthmus agenesis is a rare condition that usually occurs without any findings and is usually detected in cadaveric studies or during thyroid surgery. Detection of TIA is important for surgeons working on thyroid gland surgery [1].

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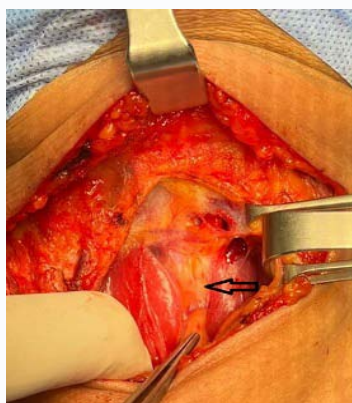


Figure 1: Trachea shown with arrow.



Figure 2: Macroscopic picture thyroid lobes.

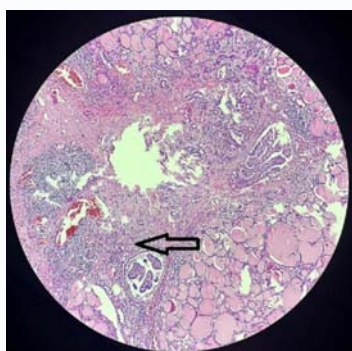


Figure 3: Tumor cells shown with arrow.

The incidence of TIA was found to be between 5% and 10% in cadaveric studies. In the study by Dixit et al. TIA was observed in 6 of a total of 41 cadavers and the incidence was 14.6% with a male to female ratio of 5:1 [4].

In the thyroid gland examination series performed by D. Joshi et al. on 90 male cadavers, absence of isthmus was found in 15 (16.6%) cases. The presence of thyroid lobe agenesis, ectopic thyroid, parathyroid hyperplasia, which are some developmental anomalies that may be associated with TIA, should be determined. The surgeon planning thyroidectomy should investigate these anomalies around the normally located thyroid gland [4, 5].

Ultrasonography, computed tomography and magnetic resonance imaging can be used in the diagnosis. In cases with hyperthyroidism, thyroid scintigraphy can be detected. However, preoperative diagnosis cannot always be made and intra-operative diagnosis is

possible. In our case, the absence of isthmus could not be detected by thyroid ultrasonography and we made the diagnosis intraoperatively. Seung Kwam Kim et al. found agenesis of the thyroid isthmus in 69 patients (41 males, 28 females) with an incidence of 4.77% [6, 7].

In the presence of thyroid isthmus agenesis on thyroid fine needle biopsy, the importance of preoperative differentiation between benign and malignant lesions is critical, considering the surgical procedure and the possibility of impairment of thyroid function [8].

When TIA is diagnosed in clinical practice, pathologies including thyroiditis, autonomous thyroid nodule, primary thyroid carcinoma, metastasis and amyloidosis should be considered in the differential diagnosis [8].

In conclusion, TIA developmental anomaly is especially important for surgeons interested in thyroid surgery in terms of determining the surgical strategy and development of complications. In this case, we present a female patient with thyroid papillary carcinoma in the right lobe with agenesis of the thyroid isthmus. Preoperative detection of the presence of TIA in a patient scheduled for thyroid surgery is important in terms of the surgical strategy.

Conflict of Interest

The authors declare no conflicts of interest related to this study.

Support Resources

No financial support was used by authors during this study.

Statement of Ethics

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and the Helsinki Declaration of the World Medical Association. The authors declare that the manuscript, complete or in parts, does not infringe any copyright and does not violate any privacy rights. The authors declare that no experiments were performed on humans or animals for this investigation. The authors state that the subject has given his written informed consent to publish his case, including publication of images.

Data Availability Statement

The authors confirm the data supporting the findings of this case report are available within the article. Raw data that support the findings of this case report are also available from the corresponding author, upon reasonable request.

Authorship Contributions

Güvenç Diner: Conceptualization, Design, Investigation, Methodology, Project administration, Validation, Writing – original draft.

Güven Erdoğan: Data collection, Methodology, Formal Analysis, Writing – review & editing.

Mustafa Uğur: Data collection, Formal Analysis, Methodology, Writing – review & editing.

All authors approve the final version of the manuscript and agree to be accountable for all aspects of the work. Authors confirm that their work is original, has not been published elsewhere, and is not under consideration by another journal.

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