

Letters to editor

Thyroid gland with absent isthmus

Introduction.

The thyroid gland is a palpable endocrine gland placed in the anterior lower neck at the level from fifth cervical to first thoracic vertebrae¹. A normal thyroid gland has two lobes which are connected by the isthmus. The normal size of the gland is 5cm by 3cm by 2cm. It is brownish red in colour and it's highly vascular. It's covered by pretracheal fascia and is in close relation to the recurrent laryngeal nerves. The thyroid gland is the second most common site for endocrine tumours, only second to gonadal tumors². It can have varieties of developmental abnormalities but isthmus agenesis is rare. It's available as case reports in electronic literature³.

We treated a 34-year-old female patient who presented to our unit with a right sided solitary nodule of the thyroid. Fine needle aspiration cytology revealed a BETHESDA 5 lesion. She had no complaint other than the neck lump. No history of other congenital abnormalities. On examination, there was a nodule attached to the upper region of the right lobe. Left lobe and isthmus were not palpable. No cervical lymph nodes were enlarged. Pulse rate was 76 bpm. The rest of the examination was normal. Her thyroid hormone levels were in normal limits with normal TSH levels. The rest of the investigations were also normal. An Ultrasound Scan was done to assess the thyroid gland and it was showed a normal size thyroid with a solitary nodule attached to the right upper pole. She underwent total thyroidectomy and during the surgery, it was noticed that there was no isthmus. The thyroid lobes were in normal position bilaterally at the normal tracheal level, there was a 1.5 x 1.5 cm size nodule in the right lobe. There were no abnormalities detected in vasculature or related structures. Patient had an uneventful postoperative period and was discharged from the ward after 48 hours.

Discussion.

Thyroid gland is developed from the endoderm of the primitive pharynx. Para follicular cells arise from the neural crest cells. The thyroglossal duct bifurcates and gives rise to both lobes and the isthmus⁴. The degeneration of the cephalic part of the thyroglossal duct gives rise to the normal thyroid gland⁵. Absent isthmus can be due to high separation. Some studies suggest that chromosome 22 plays a role in thyroid development⁶. Identifying an abnormal thyroid anatomy is important during patient management as ectopic thyroid tissue can be missed and malignant transformation can occur in these ectopic thyroid tissues (the risk is similar to normal thyroid tissue) Anatomical abnormalities of the gland are important as it can complicate the surgery. The recurrent laryngeal nerves, superior laryngeal nerves and parathyroid glands lie in close proximity to the gland. Identification of these structures are done using the surgical landmarks mainly related to the gland. When there is an abnormality, identification of these vital structures can be a challenge and hence make them more vulnerable. In this patient we identified the abnormality during surgery. With the absent isthmus, there was a chance to dissect on the tracheal wall laterally endangering the recurrent laryngeal nerve.

Abnormalities can be missed with ultrasonography as it is machine and operator dependent. In this patient it was missed in the ultrasound scan. CT scans for thyroid are not in routine practice. Most of the people with thyroid isthmus agenesis are difficult to identify biochemically as they are euthyroid⁷. In this patient

the thyroid hormone levels were normal. Thyroid isthmus agenesis can be associated with other congenital abnormalities such as agenesis of a thyroid lobe, ectopic thyroid tissue and familial syndromes⁸. In our patient, there were no other abnormalities. The abnormality is also important in tracheostomy⁹. Diagnosis of agenesis of isthmus can be done with ultrasonography, computed tomography, MRI or with scintigraphy. As in our case, it can also be identified during surgery. Even though agenesis of isthmus is a rare abnormality, awareness of potential isthmus agenesis in patients with lower neck surgery will significantly contribute to limit complications.

Key Messages

1. Agenesis of thyroid Isthmus is surgically significant for the following reasons
 - a. There is a chance ectopic thyroid tissue can be missed
 - b. Identification of vital structures can be a challenge and hence make them more vulnerable
 - c. If we were to perform a tracheostomy
2. Preoperative evaluation is important in patients with absent isthmus, dysorganogenesis, ectopic thyroid and a familial history of such.

Thank you,

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