

Mature Cystic Teratoma of the Thyroid in an 11-Year-Old Child: A Case Report

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Abstract

Mature thyroid teratomas are rare, particularly beyond the neonatal period, and may resemble more common congenital anterior neck lesions. An 11-year-old boy presented with a five-year history of a slowly enlarging anterior neck mass associated with exertional dyspnea. The mass moved with swallowing. Ultrasonography demonstrated a large cystic midline and paramedian lesion with internal echoes and a category 4 nodule in the right thyroid lobe according to the American College of Radiology Thyroid Imaging, Reporting, and Data System (TI-RADS). Fine-needle aspiration cytology of the nodule showed benign lymphoid tissue, and aspiration of the mass showed anucleate squames only, without follicular cells. Magnetic resonance imaging and computed tomography revealed a 42 x 65 x 63 mm heterogeneous lesion containing cystic, fatty, soft-tissue, and calcific components, inseparable from the inferior right thyroid lobe and displacing the trachea to the left without local invasion. The patient underwent right thyroid lobectomy. Histopathological examination identified mature derivatives of all three germ layers without immature elements, atypia, or malignancy, confirming a mature cystic teratoma. Recovery was uncomplicated. At three months, the patient was asymptomatic with an intact voice, showed no clinical evidence of recurrence, and postoperative thyroid function was normal. This case emphasizes the value of correlating imaging, cytology, operative findings, and histopathology when a pediatric neck mass has overlapping thyroglossal duct cyst, dermoid cyst, and teratomatous features.

Categories: Otolaryngology, General Surgery, Pediatrics

Keywords: anterior neck mass, histopathology, magnetic resonance imaging, mature cystic teratoma, pediatric neck mass, thyroid lobectomy, thyroid teratoma

Introduction

Anterior neck masses are common in pediatric surgical and otolaryngology practice. Head and neck teratomas are rare, accounting for about 1%-6% of pediatric teratomas [1]. Dermoid cysts may contain keratinous material, fat, or calcification, whereas teratomas may demonstrate heterogeneous components on imaging [2]. Thyroglossal duct cysts are the most common congenital midline neck lesions and typically move with swallowing or tongue protrusion [3].

Head and neck teratomas usually present in the neonatal period, when airway obstruction can be life-threatening [4-6]. Primary thyroid teratomas are especially uncommon. We report a mature cystic teratoma replacing the right thyroid lobe in an 11-year-old boy and describe the diagnostic reasoning, operative treatment, and histopathological findings.

Case Presentation

An 11-year-old boy was referred with a five-year history of an anterior neck swelling that had gradually enlarged. The swelling moved with swallowing and was associated with dyspnea on exertion. There was no dysphagia, stridor, weight loss, fever, or other constitutional symptoms. Examination showed a large, non-tender, firm-to-cystic mass occupying the midline and right lower neck. It moved with deglutition. The overlying skin was normal, and no cervical lymphadenopathy was detected.

Ultrasonography demonstrated a large cystic mass in the midline and paramedian neck, inferior to the right thyroid lobe, with internal echoes and debris (Figures 1A-1C). A right thyroid lobe nodule with macrocalcification was classified as category 4 according to the American College of Radiology Thyroid Imaging, Reporting, and Data System (TI-RADS) (Figure 1D, arrow) [7]. No suspicious cervical lymph nodes were identified. Fine-needle aspiration cytology (FNAC) of the right thyroid nodule showed benign lymphoid tissue.

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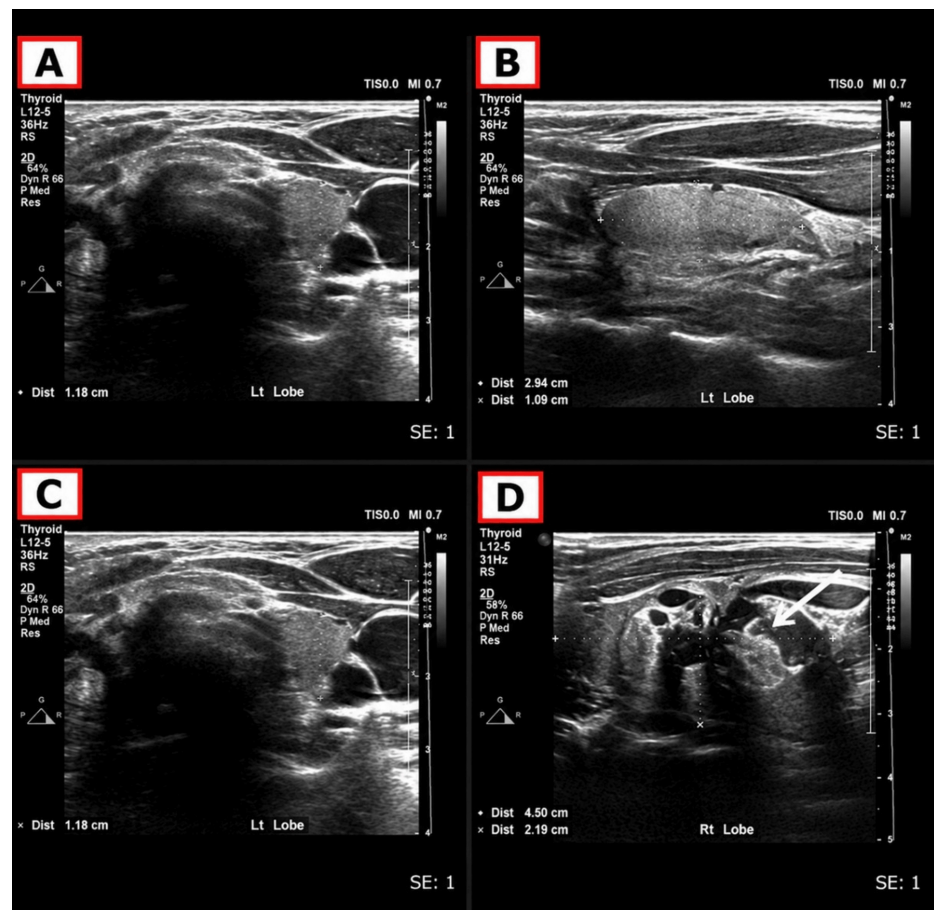


FIGURE 1: Ultrasonographic images of the neck.

(A-C) Large anterior cystic neck mass with internal echoes. (D) Right thyroid lobe nodule with macrocalcification (arrow).

Magnetic resonance imaging (MRI) revealed a $42 \times 65 \times 63$ mm heterogeneous lesion containing cystic, fatty, soft-tissue, and calcific components, extending from C5 to T2 level (Figure 2A). The lesion was inseparable from the inferior right thyroid lobe, with right-sided predominance and leftward displacement of the airway (Figure 2B).

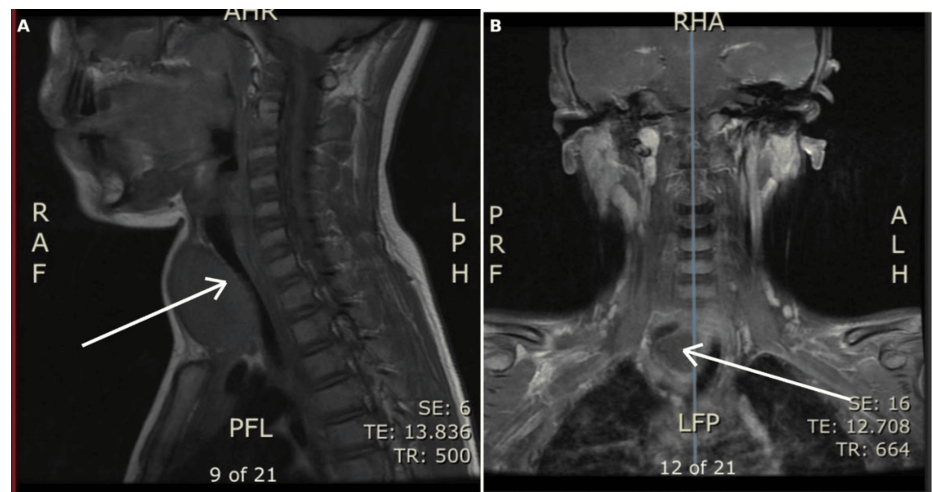


FIGURE 2: Magnetic resonance imaging of the neck mass.

(A) Sagittal image demonstrating the extent of the anterior neck mass (arrow). (B) Coronal image demonstrating the right-sided predominance of the lesion and leftward displacement of the airway (arrow).

Sonar-guided FNAC of the mass showed numerous anucleate squames only, without follicular cells. The possibilities included an epidermal inclusion cyst or part of a teratoma, and histopathological examination was recommended.

Complementary contrast-enhanced computed tomography (CT) showed a large, defined, lobulated heterogeneous mass in the anterior lower neck, right paratracheal and pretracheal in location, with post-contrast enhancement of the solid component. Superiorly, the lesion was inseparable from the inferior surface of the right thyroid lobe and shifted it superiorly. Inferiorly, it reached the upper border of the manubrium with no intrathoracic extension. It compressed the trachea with leftward deviation and luminal attenuation (least diameter approximately 9.5×7 mm) and shifted the carotid sheath laterally, with no evidence of local invasion (Figure 3).

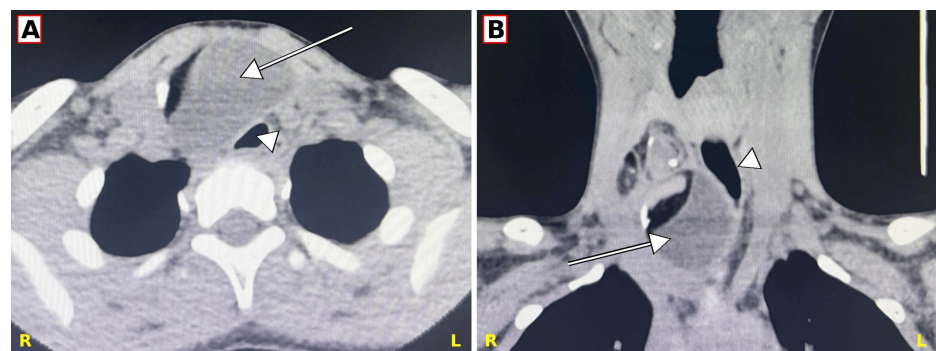


FIGURE 3: Contrast-enhanced computed tomography of the neck.

(A) Axial image showing the heterogeneous mass (arrow) compressing the trachea and displacing it to the left (arrowhead). (B) Coronal image showing the heterogeneous mass (arrow) with leftward tracheal deviation (arrowhead) and no intrathoracic extension.

As the mass kept growing over the past five years, with tracheal deviation to the left and displacement of the surrounding structures, surgical excision was planned, and a right lobectomy was performed. Right lobectomy was chosen because the mass was localized to the right lobe and did not invade the surrounding structures.

Elective excision was performed under general anesthesia. Despite the tracheal compression, endotracheal intubation was performed routinely and without difficulty. Through a transverse cervical incision, subplatysmal flaps were elevated, and the strap muscles were separated in the midline. The right thyroid lobe was markedly enlarged and replaced by a well-defined multiloculated lesion with solid and cystic components. There was no gross invasion of adjacent structures (Figure 4). The gland was mobilized with

preservation of the surrounding vital structures, and a right thyroid lobectomy was completed. Hemostasis was secured, and the wound was closed in layers.



FIGURE 4: Intraoperative photograph of the right thyroid lesion.

The right thyroid lobe is markedly enlarged and replaced by a well-defined lesion, with no gross invasion of adjacent structures (arrow).

The right thyroid lobectomy specimen showed an excised well-circumscribed mass (Figure 5). The cut surface showed fat, bone, sebum, and hair, occupying the whole lobe (Figure 6, arrows). Focal residual normal thyroid tissue was identified at the upper pole.

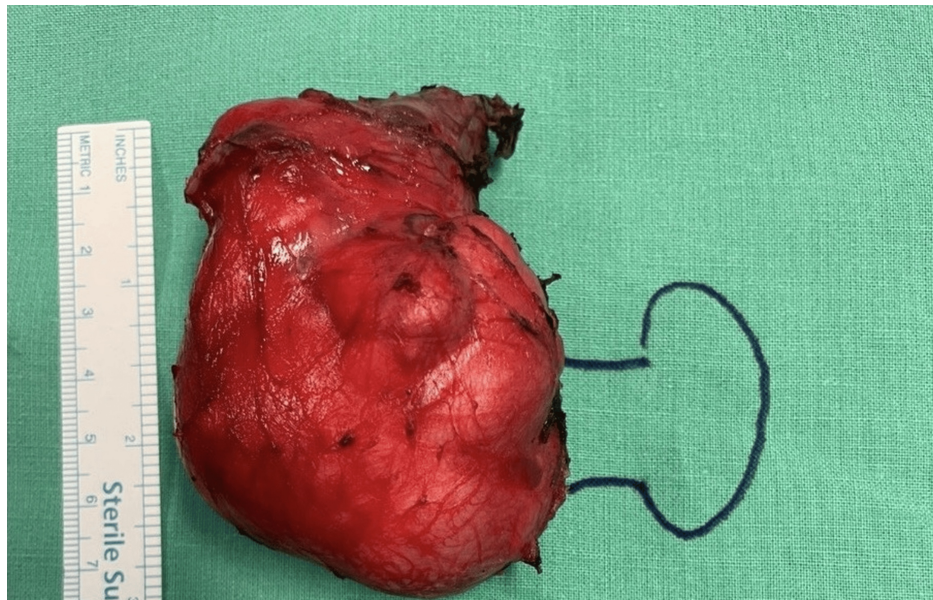


FIGURE 5: Gross specimen of the right thyroid lobectomy.

The excised well-circumscribed mass.

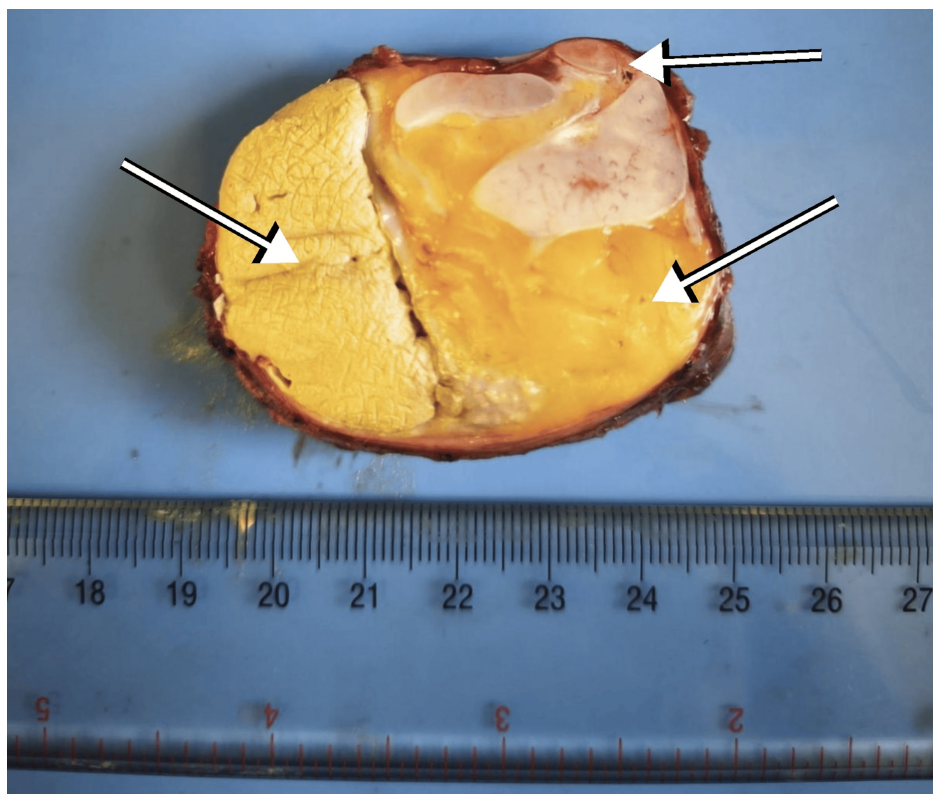


FIGURE 6: Cut surface of the mature cystic teratoma.

The cut surface shows sebaceous material (left arrow), fat (right arrow), and bone (top arrow).

Histopathological examination identified mature derivatives of all three germ layers without immature elements, atypia, or malignancy, confirming a mature cystic teratoma.

Recovery was uncomplicated. The patient was followed up at two weeks, two months, and three months after surgery. At the two-month follow-up, he was clinically well and asymptomatic, with no reported

complaints, and had returned to normal daily activities without limitations. His voice was intact, with no hoarseness, indicating preserved recurrent laryngeal nerve function. The surgical wound was well healed, with no signs of infection or other complications, and there were no features suggestive of hypocalcemia (Figure 7). Postoperative thyroid function tests were normal. At the three-month follow-up, he remained well, with no evidence of recurrence, and he was advised to continue routine follow-up with clinical and thyroid function monitoring.



FIGURE 7: Postoperative follow-up photograph.

Well-healed transverse cervical incision with no visible neck swelling at two months postoperatively.

Discussion

Cervical teratomas are rare germ cell tumors and are usually recognized antenatally or during the neonatal period because of a visible neck mass or airway compromise [4–6,8]. Thyroid teratomas are rarer still. Presentation at 11 years of age after five years of slow enlargement therefore differs from the typical neonatal presentation. Although this patient reported exertional dyspnea and had radiographic tracheal deviation, he had no stridor or acute airway compromise.

The principal diagnostic challenge was the overlap with more common midline cystic neck lesions. Movement with swallowing and the midline component suggested a thyroglossal duct cyst, while anucleate squames on cytology were compatible with a dermoid or epidermal inclusion cyst [2,3]. However, the combination of fat, calcification, soft tissue, and fluid on MRI and CT, together with inseparability from the right thyroid lobe, favored a thyroid teratoma [2,9]. In this setting, aspiration cytology helped characterize the cyst contents but could not establish the full range of tissue elements required for diagnosis.

Cross-sectional imaging was essential for defining the lesion composition, thyroid relationship, airway displacement, and lack of invasion of surrounding structures. These findings informed airway preparation and surgical planning. Complete surgical excision is the primary treatment for pediatric head and neck teratomas [5,6]. A right lobectomy was appropriate in this patient because the lesion had replaced the right lobe while remaining well circumscribed and noninvasive, allowing preservation of the contralateral thyroid and adjacent vital structures.

Histopathological examination remains definitive. The mature ectodermal, mesodermal, and endodermal derivatives in this specimen, combined with the absence of immature or malignant tissue, established the diagnosis of a mature cystic teratoma. Complete resection is generally associated with favorable outcomes; however, recurrence has been reported, and continued follow-up remains appropriate [4,5]. Postoperative thyroid function should also be monitored after thyroid lobectomy; in our patient, postoperative thyroid function tests were normal.

This report is limited by the absence of documented preoperative serum alpha-fetoprotein and beta-human chorionic gonadotropin levels and by the relatively short follow-up of three months. Longer clinical surveillance is required to document sustained disease control.

Conclusions

A mature cystic teratoma should be considered when a pediatric anterior neck mass contains a mixture of

cystic, fatty, calcific, and soft-tissue components, even when its midline location and movement with swallowing initially suggest a thyroglossal duct cyst. Cytology may identify keratinous contents but may not reliably distinguish a dermoid cyst from a teratoma.

In this patient, MRI and CT identified continuity with the right thyroid lobe and guided operative planning. Right thyroid lobectomy achieved complete excision, and histopathology confirmed a mature teratoma without immature or malignant elements. The uncomplicated recovery illustrates the favorable outcome expected after complete resection, while longer clinical and thyroid function follow-up remains necessary.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Omar Altawash, Mohammad Zanki, Mariam Alshammari

Acquisition, analysis, or interpretation of data: Omar Altawash, Mohammad Zanki, Mariam Alshammari

Drafting of the manuscript: Omar Altawash, Mohammad Zanki, Mariam Alshammari

Critical review of the manuscript for important intellectual content: Omar Altawash, Mohammad Zanki, Mariam Alshammari

Supervision: Mohammad Zanki

Disclosures

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