CASE REPORT

Unusual diagnosis of a solitary thyroid nodule in the paediatric population: cervical thymic cyst

Dhalapathy Sadacharan,^{1,2,3} Anjali Sathya,² Divya Ravikumar,³ Deepakala Nallapa⁴

¹Department of Endocrine Surgery, Madras Medical College, Chennai, Tamil Nadu, India

²Department of Endocrinology and Endocrine Surgery, Vijaya Group of Hospitals, Chennai, Tamil Nadu, India

³Endocrine and Speciality Clinic, Chennai, Tamil Nadu, India

⁴Department of Pathology, Vijaya Group of Hospitals, Chennai, Tamil Nadu, India

Correspondence to

Dr Dhalapathy Sadacharan, drsdhalapathy@gmail.com

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SUMMARY

We present a case of an 8-year-old girl with a painless swelling in her neck. An ultrasonogram revealed a cystic nodule with internal echoes, lying posterior to right lobe of thyroid, and MRI confirmed it. Thyroid scintigraphy did not show any uptake in the swelling. Intraoperatively, the lesion was densely adherent to the thyroid gland, hence a hemithyroidectomy was performed. Histopathology showed it to be an ectopic cervical thymic cyst with parathyroid tissue.

BACKGROUND

Cervical thymic cyst (CTC) is a very rare congenital neck anomaly with an incidence of 0.3% among all congenital cervical cysts in children.¹ Preoperative radiological investigations cannot reliably identify a neck mass as a CTC and differentiate it from other cystic neck masses. Third arch anomalies can be found anywhere along the tract of descent of the thymus and can commonly be associated with other third arch derivatives, such as the parathyroid glands. Histopathology is the gold standard for diagnosis. Surgery remains the primary treatment modality for this unusual entity. High clinical suspicion and the possibility of this rare entity in the differential diagnosis are of paramount importance. It is invariably diagnosed on histopathology and a preoperative diagnosis is seldom made. However, making a preoperative diagnosis is vital, as an inadvertent excision of thymic cyst can result in immunodeficiency, if it is the only functioning thymic tissue with absent mediastinal thymus.²

CASE PRESENTATION

We present a case of an 8-year-old girl with a swelling on the right side of her neck for 10 months. The incidentally detected swelling was painless, with no compressive features. Family history was unremarkable. General examination was normal. Examination of the right side of the neck revealed a solitary swelling that was non-tender, firm, mobile, measuring about 4.0×4.0 cm in size and moving up with deglutition. Provisional diagnosis of a solitary thyroid nodule was entertained.

INVESTIGATIONS

Thyroid function tests, serum calcium, phosphorus and intact parathormone were within normal limits. High resolution ultrasonography (USG) revealed a cystic mass measuring 2.3×1.8 cm, with internal echoes in the posterior aspect of the right lobe of thyroid. MRI revealed a cystic lesion measuring 3.0×2.9×1.9 cm in the right paratracheal

region, extending to C4 and C5 prevertebral spaces; the right lobe of the thyroid was being pushed anteriorly. Technetium 99 m pertechnetate scintigraphy showed non-uptake of the tracer (cold nodule) and normal uptake in the remaining part of the thyroid gland ([figure 1](#)). Fine-needle aspiration cytology revealed nodular colloid goitre.

DIFFERENTIAL DIAGNOSIS

Solitary thyroid nodule, parathyroid cyst and branchial cyst were considered in the differential diagnosis.

TREATMENT

Intraoperatively, the nodule was in the superoposterior aspect of the right lobe and non-separable from it, necessitating a hemithyroidectomy. The left lobe of the thyroid was normal and there were no enlarged cervical lymph nodes ([figure 2](#)).

OUTCOME AND FOLLOW-UP

Histopathological examination revealed a unilocular cyst lined by cuboidal epithelium containing compressed thymic tissue with adjacent parathyroid tissue in a fibrocollagenous stroma ([figure 3](#)). The patient had an uneventful postoperative period on follow-up and now, 3 years later, has no residual/recurrent disease.

DISCUSSION

Cervical thymic anomalies are branchial arch anomalies because of their embryological derivation from the third arch. CTCs are more common than ectopic thymic tissue but remain a very rare presentation of congenital neck lesions.³ Embryologically, the thymus and inferior parathyroid glands are derived from the third pharyngeal pouches. They migrate together in a caudal and medial direction and reach their usual location.⁴ Primordial thymic tissue is initially connected to the pharynx by hollow structures called thymopharyngeal ducts.⁵ During their path of descent, remnants of thymic tissue may be left behind, leading to the formation of a cyst.⁶ The parathyroid gland may be found in the periphery of the cyst, indicative of the common embryonic origin from the third branchial pouch.¹ The most common presentation of cervical thymic anomalies is a mass with associated compressive symptoms. CTCs have a slight preponderance for males under the age of 10 years, and are more commonly located on the left side of the neck.⁷ A key clinical piece of information that can lead to suspicion of a third arch anomaly is the close relation of these arch elements to the thyroid gland.

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Figure 1 (A) Clinical image showing right solitary thyroid nodule (arrow) interpreted as a (B) cold nodule in Technetium 99 m thyroid scintigraphy, (C) hypointense lesion in T1-weighted MRI and (D) hyperintense lesion in T2-weighted MRI.

Inflammation of these anomalies can often lead to recurrent bouts of thyroiditis.⁸ Although the diagnosis can be suspected on clinical history and physical examination alone, the definitive diagnosis of a CTC comes from surgical excision and pathological examination.

CTC are mostly unilocular.⁷ The cyst contents vary from a clear or straw coloured to a cloudy, dark brown fluid. Occasionally, the contents are gelatinous or semisolid and may contain necrotic debris.⁹ The pathological hallmark is the thymic parenchyma with lymphoid tissue and Hassall corpuscles

Figure 2 (A) Intraoperative picture showing mass in the right thyroid lobe and (B) right hemithyroidectomy specimen picture showing thymic cyst (short arrow) in continuity with right thyroid lobe (long arrow).

Figure 3 Photomicrograph (×10) showing cyst wall showing compressed thymus (short arrow) and parathyroid tissue (long arrow).

found within the cyst wall, sometimes accompanied by parathyroid tissue.⁵ USG usually demonstrates a round mass with uniform low echogenicity and a lack of internal septations with no acoustic enhancement. USG can be useful in determining the relationship of the lesion to the cervical vasculature.¹⁰

CT may show a well-circumscribed lesion with thin walls and central mucous attenuation (10–25 HU). When infected, the

cyst wall or tract tends to become thickened, irregular and enhancing, with intravenous contrast. The main drawback of CT is the radiation exposure.¹⁰ MRI may show a cystic lesion with low-to-intermediate T1-weighted and high T2-weighted signal intensity. The excellent soft tissue detail and lack of radiation exposure make it the primary choice over CT.¹⁰

Complete surgical excision is curative and remains the mainstay of management. Complication rates are very low and recurrence is rare.⁷

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Competing interests None declared.

Patient consent Obtained.

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Learning points

- Branchial cleft anomalies should be strongly suspected in every case of neck swelling in the paediatric age group.
- Recurrent thyroiditis should raise a suspicion of third arch anomalies.
- The definitive diagnosis of cervical thymic cyst is by histopathological examination.

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