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Case Report

Pediatric Hashimoto's thyroiditis: evaluating a rare cause of midline neck swelling

N. R. Ankle, Akash Rai*, Tejaswini Palagadu, Ayushi Mehta, Tharun Choudary

KLE University, Belagavi, Karnataka, India

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***Correspondence:**
Dr. Akash Rai,
E-mail: aakashrai1995@gmail.com

ABSTRACT

The incidence of Hashimoto's thyroiditis (HT) in childhood reaches its peak between early to mid-puberty. The AIT's clinical presentation is optimally assessed with thyroid function, as pediatric patients may exhibit a range of thyroid statuses. A 9-year-old female presented to the ENT OPD with a midline neck swelling, and was diagnosed to have HT. This case report discusses the evaluation and relevant management of this disorder.

Keywords: Hashimoto's, Thyroiditis, Pediatric, Evaluation, Management

INTRODUCTION

Most children's neck masses in primary care are benign, reactive lymph nodes caused by frequent pediatric viral infections. Atypical disorders, such as neoplasms, vascular lesions, and embryologic anomalies occur in pediatric otolaryngology practices.[1]

Children's neck masses are frequently divided into three groups: neoplastic, inflammatory, and congenital. The majority of childhood neck tumors are benign, though malignancies may develop.[1]

Thyroglossal duct cysts represent the most prevalent congenital neck masses. Dermoid, as well as epidermoid cysts, are midline lesions that generally don't raise after tongue protrusion or swallowing. Similar to TDCs, dermoid as well as epidermoid cysts are distinctly well-defined and generally asymptomatic. Plunging ranulas may be acquired or congenital lesions. Midline cervical clefts are congenital neck lesions resulting from branchial arches in anterior neck's inadequate union.[2]

Salivary gland tumors, fibromas, neurofibromas, lipomas, and pilomatrixomas are examples of common benign neoplastic lesions. Thyroid carcinoma, rhabdomyosarcoma, lymphoma, and metastatic nasopharyngeal carcinoma are among the malignant neck lesions that can occur in youngsters, although they are uncommon.[3]

The most effective imaging procedure for a palpable or developing mass is ultrasonography. When assessing a suspected retropharyngeal or deep neck abscess or a malignancy, computed tomography with intravenous contrast media is advised.[3]

CASE REPORT

A 9-year-old female patient arrived at the otolaryngology OPD with concerns regarding midline neck swelling for four months. No H/O rapid enlargement of the swelling, voice change, dysphagia, odynophagia, or respiratory distress were present. No signs of hypo or hyperthyroidism were elicited.

Local examination-4×3 cm solitary, ovoid, swelling present in the midline. Skin over the swelling appears normal, borders appear regular, swelling moves on

deglutition, non-tender, no local rise in temperature, firm, non-reducible, non-fluctuant, margins-regular.

TSH-108 mcIU/ml (0.6-4.8) was drastically elevated, fT4 was 4.1 µg/ml(increased), USG thyroid revealed- thyroid was bulky with heterogenous echotexture and increased vascularity was visible on Doppler study- suggestive of thyroiditis. Anti-TPO antibody was 376 IU/ml (0-35) was also exceedingly elevated- suggesting HT.

A pediatric endocrine opinion was sought, they advised starting on Levothyroxine with follow-up bianually with TSH reports.

The patient was started on the medications and discharged.

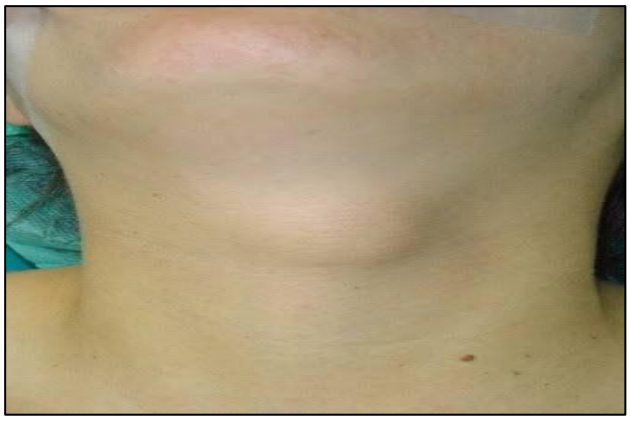
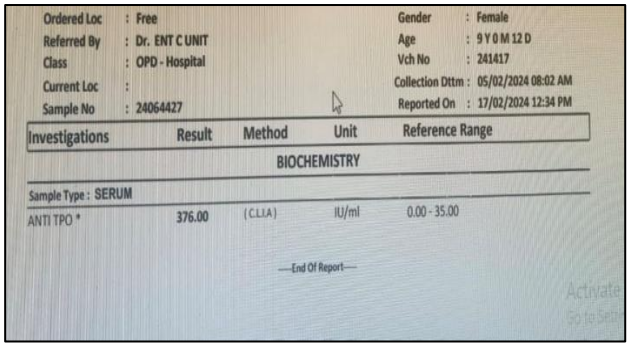


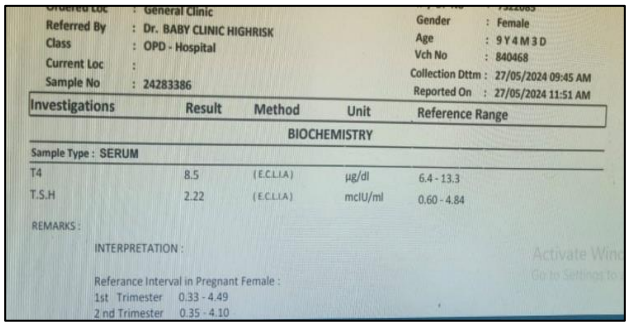
Figure 1: Midline neck swelling for four months.



Ordered Loc : Free			Gender : Female	
Referred By : Dr. ENT C UNIT			Age : 9 Y 0 M 12 D	
Class : OPD - Hospital			Vch No : 241417	
Current Loc :			Collection Dttm : 05/02/2024 08:02 AM	
Sample No : 24064427			Reported On : 17/02/2024 12:34 PM	
Investigations	**Result**	**Method**	**Unit**	**Reference Range**
BIOCHEMISTRY				
Sample Type : SERUM				
ANTI TPO *	376.00	(CLIA)	IU/ml	0.00 - 35.00

—End Of Report—

Figure 2: TSH reports.



Referred By : Dr. BABY CLINIC HIGHRISK			Gender : Female	
Class : OPD - Hospital			Age : 9 Y 4 M 3 D	
Current Loc :			Vch No : 840468	
Sample No : 24283386			Collection Dttm : 27/05/2024 09:45 AM	
			Reported On : 27/05/2024 11:51 AM	
Investigations	**Result**	**Method**	**Unit**	**Reference Range**
BIOCHEMISTRY				
Sample Type : SERUM				
T4	8.5	(ECLIA)	µg/dl	6.4 - 13.3
T.S.H	2.22	(ECLIA)	mcIU/ml	0.60 - 4.84

REMARKS :

INTERPRETATION :

Referance Interval in Pregnant Female :

1st Trimester 0.33 - 4.49

2nd Trimester 0.35 - 4.10

Figure 3: TSH reports.

DISCUSSION

HT, or autoimmune thyroiditis, is a condition marked by diminished thyroid function due to antibodies produced by the body that target the thyroid gland. The disease initiates with lymphocytic infiltration and ultimately advances to permanent fibrosis, resulting in the loss of thyroid function.[8] Impacting roughly 1-2% of the pediatric population.[9]

The incidence of AIT in childhood reaches its peak between early to mid-puberty. The emergence of conditions is infrequent before 3 years, however, instances in infancy have been documented. A significant female predominance has been observed, with a female-to-male ratio reaching 3.4:1, particularly prevalent in individuals with Down and Turner syndromes.[5]

Data regarding the prevalence of HT in pediatric population is limited, mainly due to evolving diagnostic criteria throughout time. Rallison et al conducted the only published epidemiological study on a population of 5,179 children, showing a 1.2% prevalence. However, true prevalence was likely underestimated since thyroid had been assessed solely through palpation rather than ultrasound. Consequently, numerous instances of thyroiditis were likely undiagnosed.[4]

The conventional diagnostic criteria, as outlined by Fisher, included the appearance of a goitre, high antithyroid antibodies, a thyroid scintigram with enhanced irregular tracer uptake, as well as a positive perchlorate discharge test.[4]

The AIT's clinical presentation is optimally assessed with thyroid function, as pediatric patients may exhibit a range of thyroid statuses, including full euthyroidism, severe overt hypothyroidism, mild subclinical hypothyroidism, or subclinical or overt hyperthyroidism (Hashitoxicosis). Most children diagnosed with AIT are either subclinically hypothyroid or euthyroid.[5]

The most reliable diagnostic tool is the thyroid ultrasonography, which has mostly substituted fine-needle biopsy.[4]

The standard ultrasonography reveals a hypo-echoic heterogeneous thyroid. Hypo-echogenicity results from lymphocyte aggregations, manifesting as highly homogeneous tissue devoid of reflective surfaces.[4]

Imaging procedures, such as thyroid ultrasound &/or thyroid uptake as well as scan, can be conducted if thyroid Ab tests yield negative results or if a nodule is visible; however, they are rarely needed. Heterogeneous echogenicity observed on ultrasound examination has occasionally been reported before emergence of Abs.[6]

Since euthyroidism occurs frequently in HT, evaluating thyroid function is only beneficial when it is aberrant.

Although circulating antithyroid Abs are absent in 10-15% of individuals with HT, the presence of thyroglobulin Abs and TPO Abs supports the diagnosis but their absence does not rule it out. These antibodies have a high sensitivity but a low specificity.[4]

The assessment of serum TSH levels is the most effective preliminary screening test for primary hypothyroidism. An increased TSH level necessitates the assessment of serum free thyroxine (fT4) concentration to differentiate between subclinical (normal fT4) and overt (low fT4) hypothyroidism in the child. The presence of elevated serum levels of Tg Abs and/or TPO Abs confirms an AIT diagnosis.[6]

In 50% of instances, subclinical hypothyroidism is identified by elevated TSH levels alongside normal FT4 levels. Fewer than 10% of patients exhibit moderate hyperthyroidism. The latter typically remains unnoticed as it is transient, persisting for merely a few months.[6]

In individuals with severe, chronic hypothyroidism, gradual correction using LT4 is recommended to reduce the risk of adverse effects, including decline in academic performance, diminished attention span, insomnia, hyperactivity, as well as behavioral issues.[7]

AIT-induced subclinical hypothyroidism in children has a high propensity to remit, based on long-term follow-up. Therefore, in the absence of a significant hypothyroidism family history and if patients exhibit no symptoms, it is prudent to reevaluate thyroid function in 6 months. Conversely, several originally euthyroid people may develop hypothyroidism with time. Consequently, consistent follow-up is essential.[6]

In pediatric patients, typical replacement dosage of LT4 is nearly 100 µg/m^2 or 4-6 µg/kg for children aged 1-5, 3-4 µg/kg for those aged 6-10, and 2-3 µg/kg for those aged 11 and above. A slightly higher dosage of LT4 is given to goiter patients to retain their TSH levels within low normal range (0.3-1.0 mU/L in an ultrasensitive assay), hence reducing the goitrogenic effect of the drug. T4 as well as TSH levels must be assessed following a minimum of 6-8 weeks of the prescribed dosage administration in the child. After the attainment of euthyroid condition, patients ought to be administered every 6-12 months. Even in cases of severe hypothyroidism, thyroid hormone replacement doesn't result in a substantial reduction in children's weight who are overweight.[6]

CONCLUSION

A proficient clinician's comprehension of anatomical neck spaces as well as prevalent causes of children's neck masses may significantly diminish unnecessary evaluation, expenses, therapy delays, and parental anxiety.

Timely and precise diagnosis of thyroid problems in the pediatric population is crucial for ensuring appropriate physical and cognitive development.

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