CASE REPORT

Papillary Thyroid Carcinoma Presenting as Benign Thyroid Nodule Preoperatively in a Child: A Case Report

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ABSTRACT

We report a case of papillary thyroid carcinoma in a 6-year-old male child who presented with a solitary midline thyroid nodule initially diagnosed as adenomatous goiter on fine needle aspiration cytology. Our case highlights the need for careful preoperative workup, management and follow-up of such cases in the pediatric age group.

Keywords: Solitary thyroid nodule, papillary thyroid carcinoma and pediatric age group

INTRODUCTION

Solitary thyroid nodules in children are uncommon, with a prevalence of 1-1.7%, and are more likely to be malignant (22-26%) when compared to adults (7-15%) and hence require close monitoring.[1] Thyroid cancer is the most common endocrine malignancy in the paediatric population[2] and papillary thyroid carcinoma (PTC) accounts for 90% or more of all childhood cases[1]. Thyroid cancer management in children requires a multidisciplinary team, including a paediatric endocrinologist, high-volume thyroid surgeon, nuclear medicine physician, paediatric radiologist, paediatric oncologist and a psychosocial support team. Despite the aggressive nature of paediatric DTC compared with adults, overall survival is excellent. Paediatric thyroid cancer has an excellent prognosis as compared to adults, with 30-year survival rates of 99-100% for PTC and 91% for non-PTC.[3]

We report a case of a 6-year-old child who presented with clinical features initially suggestive of benign goitre, which postoperatively turned out to be PTC after histological examination of the excised thyroid specimen. The report highlights the difficulties that one may encounter in terms of diagnosing and managing papillary thyroid carcinoma in a child.

Case Presentation:

A 6-year-old male child presented to our ENT-OPD with complaints of anterior midline neck swelling for the past 1 year which was gradually increasing in size. He denied any compressive symptoms such as dysphagia, dyspnea or hoarseness. He had no family history of thyroid disease.

On physical examination, a single well-defined, smooth surface, soft to firm globular midline swelling measuring around 1.5 × 1.5 cm and the swelling moved with deglutition (Fig 1). His thyroid function test was within normal limits. Thyroid ultrasound indicated a solid, slightly hypoechoic nodule involving the isthmus of 1.3 × 0.7 cm with no calcification or cervical lymphadenopathy corresponding radiologically to TIRADS 3 (Fig 2). Computed tomography (CT) scan of the neck indicated a well-defined hypodense solid nodule involving the isthmus measuring 1.4 × 0.9 cm without invasion of adjacent structures (Fig 3). Final needle aspiration cytology showed Adenomatous goiter – Bethesda grade.[2]

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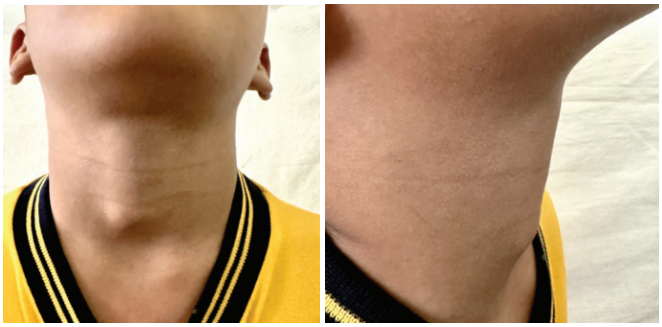

Fig 1: Anterior midline neck swelling

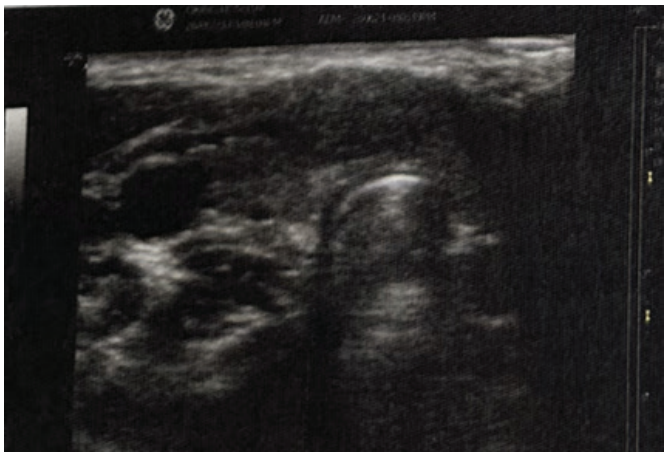

Fig 2: Ultrasound neck showing a hypoechoic nodule 1.3 x 0.7 cm involving the thyroid isthmus

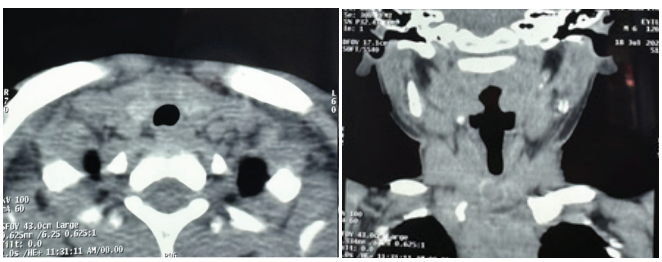

Fig 3: CT neck showing a well-defined hypodense solid nodule involving the isthmus measuring 1.4 x 0.9 cm without invasion of adjacent structures.

The patient underwent isthmusectomy, and the postoperative period was uneventful. Macroscopic examination of the excised specimen showed a well-circumscribed, solid, nodular lesion measuring 1X1 cm in size (Fig 4).

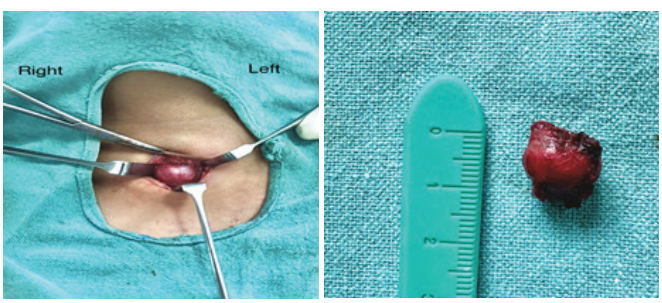

Fig 4: Intra-op finding of a single well-defined thyroid mass involving the thyroid isthmus

Hematoxylin and eosin-stained sections of the lesion showed histologic features of an encapsulated lesion showing papillary architecture with round-oval nuclei showing nuclear clearing and grooves, and focal areas of calcification suggestive of encapsulated PTC. The tumor margins were 1mm. There was no perineural or perivascular invasion or extra-thyroidal extension.

The tumor been small 1 × 1 cm in size with no high-risk features in the post operative HPE report, the option of close follow-up or total thyroidectomy was offered to the patient.

On follow-up after 3 months, a repeat US was done, which revealed an absent isthmus with no residual or recurrent mass. No suspicious metastatic cervical node was seen. Following a 3-year follow-up, the patient remains disease-free.

DISCUSSION

Thyroid nodules in children are rare, and if present, they indicate a higher risk of malignancy.

The initial manifestation of thyroid cancer is usually asymptomatic solitary neck mass with normal thyroid hormone levels in 70% of cases. Based on pathological examination, thyroid nodules in children are reported to have a higher incidence of malignancy than in adults (22-26% and 5-15%, respectively). Similarly, our patient also presented with an asymptomatic neck mass with normal thyroid hormone levels. The risk factors for PTC are female sex, a positive family history of thyroid disease and exposure to low-level head and neck irradiation.[2] PTC in females is due to a correlation between sex hormone changes during puberty and/or pregnancy and the increased risk of thyroid cancer.[3]

In our case, it was a male child with no history of exposure to radiation or family history of TC or any other thyroid disease. Evaluation and management of thyroid nodules in children requires a staged approach. Ultrasound is the first-line imaging investigation for thyroid nodules. US characteristics and clinical context should be used rather than size alone to identify nodules that warrant FNA. MRI or CT with contrast is considered in patients with large or fixed thyroid masses, vocal cord paralysis, or bulky metastatic lymphadenopathy to optimise surgical planning. Correspondingly, after the standard work-up, our patient was diagnosed with a benign lesion – adenomatous goitre. The recommended surgery for thyroid cancer in children is total thyroidectomy[2,4,5] due to the high risk of bilateral or multifocal disease and recurrence[2,5] and it also facilitates the use of radioactive iodine therapy and serum thyroglobulin levels for surveillance postoperatively. However, according to Sudoku et al, a thyroid lobectomy and central neck dissection may be considered for unifocal T1a PTC.[12] Neck dissection is recommended for patients with any involved lymph nodes to improve local and regional control, but prophylactic lymph node dissection is debatable and is not generally recommended for children,[6] but there are studies

where TT with prophylactic CND has shown increased DFS, as high as 95% at 5 and 10 years.[7,8,9]

When differentiated thyroid cancer is discovered on the pathological examination of partial thyroid resections, then completion thyroidectomy is recommended.[10] However, some argue that lobectomy and isthmusectomy followed by radioiodine ablation of remaining thyroid tissue and suppression of TSH with thyroid hormone replacement leads to excellent long-term survival.[11]

Our patient underwent isthmustectomy for adenomatous goitre, but postoperatively, the histology showed PTC. Since the patient belonged to a low-risk group, the patient was advised to be on close follow-up, considering the age and complications post-total thyroidectomy.

Total thyroidectomy has higher operative risks in children compared with adults, which include hypoparathyroidism and recurrent laryngeal nerve injury. Lifetime thyroid hormone replacement has potentially greater effects on young patients as well1. Hence, it is still not clear if total thyroidectomy is mandatory for paediatric PTC since risks may outweigh benefits or if limited surgery is more beneficial. Currently, there is a lack of data to predict which children may be candidates for more limited surgery. Patients with PTC require a regular follow-up by testing serum Tg level and performing neck ultrasonography. The target level of suppressed TSH should be obtained. In addition, if the Tg level increases and thyroid ultrasound is normal, a chest CT scan or a WBS should be performed.

In the multidisciplinary tumor board (MDT), the patient was discussed the option of total thyroidectomy or close follow-up. After discussing with the patient party, we chose to follow up the patient with regular neck ultrasound in view of the postoperative histopathology report showing` 1mm all around the tumor mass with no aggressive features related to the tumor. Our patient has been on regular follow-up and is disease-free for the past 3 years.

CONCLUSION

Isthmusectomy may be done for small-sized papillary thyroid carcinoma involving the isthmus with no aggressive features related to the tumor to improve the quality of life for the patient, like lifelong thyroxine medication after total thyroidectomy.

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