International Medicine
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Research Article

Papillary Thyroid Carcinoma in a 14-Year-Old Boy Manifested as Goiter, Lacking Microcalcifications and Accompanied by Swollen Cervical Lymph Nodes

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ARTICLE INFO

Article History:

Received: 12-04-2024

Accepted: 08-05-2024

Keywords:

Cervical Lymph Nodes

Thyroid Carcinoma

Histopathological examination

Thyroid Disease

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ABSTRACT

In this case report, we discuss the unusual presentation of papillary thyroid carcinoma (PTC) in a 14-year-old boy who exhibited no prior exposure to radiation or familial history of thyroid cancer. The patient presented with goiter and multiple bilateral enlarged cervical lymph nodes, yet standard thyroid function tests returned normal results. Notably, the thyroid was multinodular and hypervascularized, measuring 3.5 x 2.5 x2 cm, with numerous nodular formations in the cervical area that mimicked the structure of thyroid tissue on ultrasonography. Further assessments including an FDG18 PET scan confirmed the hypermetabolic nature of the thyroid and cervical lymph nodes. Initial blood tests suggested normal thyroid profile. However, in fine needle aspiration cytology papillary thyroid carcinoma was suspected and later confirmed by histopathological examination. Despite these initial findings, the presence of a palpable goiter and enlarged lymph nodes warranted a more invasive approach, leading to a lymph node biopsy and a left hemithyroidectomy. The patient underwent further treatment with I (131). This case underscores the critical need for a thorough diagnostic evaluation and a high index of suspicion in pediatric patients presenting with atypical symptoms of thyroid enlargement and lymph node involvement, even in the absence of microcalcifications. This case serves as a poignant reminder of the imperative for comprehensive diagnostic evaluation and a vigilant index of suspicion, particularly in pediatric patients displaying atypical symptoms of thyroid enlargement and lymph node involvement. Notably, the absence of microcalcifications, which often serve as a hallmark of PTC, underscores the necessity for clinicians to remain astute to diverse presentations of this malignancy, especially in younger populations where such occurrences are rare.

INTRODUCTION

Papillary thyroid carcinoma (PTC) in children is a rare but serious condition, representing only 1.8% of thyroid cancers diagnosed during childhood. This low incidence contributes to the limited amount of pediatric-specific data available on this disease. Typically, papillary thyroid carcinoma is the most common type of thyroid cancer in children, often developing after exposure to radiation. The typical presentation of PTC includes the appearance of a thyroid nodule, which may or may not be accompanied by swollen cervical lymph nodes[1-3].

Papillary thyroid carcinoma often manifests as a palpable thyroid nodule in the neck. In some cases, these nodules are detectable during a physical examination or incidentally discovered through imaging that is performed for other reasons. In pediatric patients, the detection and diagnosis of PTC are complicated by the general rarity of the condition and the subtle nature of its initial symptoms [4.5].

In children, PTC usually presents more aggressively compared to adults. While adults may have a single nodule, children often present with multiple nodules and more extensive involvement of cervical lymph nodes. This extensive nodal involvement in children can complicate both diagnosis and subsequent treatment strategies [6].

The usual presentation of PTC in children, apart from nodules, can

include symptoms such as a noticeable swelling in the neck (goiter), changes in voice, difficulties in swallowing, and in some cases, respiratory difficulties if the tumor is large enough to compress the airway. Despite these potential symptoms, many cases in children are asymptomatic and are only discovered during routine physical examinations or assessments for unrelated medical issues[7-9].

The standard features of PTC on imaging include the presence of a thyroid nodule and possibly microcalcifications, tiny deposits of calcium within the thyroid that appear as bright spots on ultrasound. These microcalcification are often considered a key diagnostic feature as they imply the presence of PTC. However, their absence does not rule out the disease, particularly in pediatric cases, which can present with unique and varied imaging features compared to adult cases. In the pediatric population, the absence of microcalcifications can lead to diagnostic challenges. Without this typical feature, clinicians must rely more heavily on other diagnostic criteria and possibly a more extensive use of diagnostic imaging and histopathology to confirm the presence of cancer[10].

We report a particularly uncommon presentation of PTC in a boy, who presented with a goiter, an enlarged thyroid gland, but without the typical microcalcifications. This case is significant because it highlights the variability in presentation of PTC among pediatric patients and the need for awareness among healthcare providers about the less typical manifestations of the disease. In this case, the boy did not exhibit the common signs of microcalcifications, which are often sought as an indicator of PTC on diagnostic imaging. Instead, his condition was identified due to the presence of a visibly enlarged thyroid gland (goitre) and swollen cervical lymph nodes. These symptoms prompted further investigation into the cause of the enlargement and swelling[11,12].

Given the absence of microcalcifications, the diagnosis required a more nuanced approach. The healthcare team conducted a series of diagnostic tests, including blood tests to assess thyroid function, ultrasound to examine the structure of the thyroid gland and the extent of lymph node involvement, and fine-needle aspiration of the thyroid nodules and lymph nodes to confirm the presence of malignancy. These tests were crucial in ruling out other causes of thyroid enlargement, such as Hashimoto's thyroiditis or benign thyroid nodules, which are more common in pediatric patients than malignancy.

This case underscores the importance of considering a diagnosis of PTC even in the absence of some of the disease most characteristic signs, such as microcalcifications. It also highlights the need for a high index of suspicion and a thorough diagnostic evaluation in children presenting with atypical symptoms such as a non-specific goitre and lymph node enlargement without other typical features of PTC. The rarity of pediatric thyroid cancer, coupled with the variable presentation, makes it crucial for healthcare providers to be vigilant and proactive in assessing symptoms that could indicate underlying malignancy. Early and accurate diagnosis is essential for effective treatment and management, which can significantly improve prognosis and outcomes in children diagnosed with this rare form of cancer[17-19].

CASE PRESENTATION

A young boy presented with a significantly enlarged thyroid gland (goiter) and multiple swollen lymph nodes in the neck area, but without any personal or familial history of thyroid cancer or exposure to radiation. His thyroid was clinically evaluated at grade 2, and he exhibited multiple enlarged bilateral cervical lymph nodes. Despite these concerning signs, his thyroid function tests returned normal results[20].

During an ultrasound examination, the boy thyroid was observed to be multinodular and hypervascularized, measuring 3.5x2.5x2 cm. Additionally, numerous bilateral cervical nodular formations were seen, which mirrored the ultrasound structure typically seen in thyroid tissue. An FDG18 PET scan further illustrated a hypermetabolic thyroid and similarly active cervical lymph nodes, although no other hypermetabolic areas were detected elsewhere in the body [21].

Blood tests ruled out an inflammatory condition, and tumor markers, including calcitonin, were not present, suggesting no active malignancy initially. Fine needle aspiration cytology of the thyroid was suspicious for carcinoma. On the basis of these findings and presence of a palpable goiter and enlarged lymph nodes led to the decision to proceed with a lymph node biopsy and left hemithyroidectomy[22].

After surgery, the thyroid tissue send for histopathological examination revealed papillary thyroid thyroid carcinoma, confirmed through positive thyroglobulin staining. Histopathology identified the thyroid cancer as a papillary thyroid carcinoma (PTC). The postoperative care regimen included T3 (Cynomel) to manage thyroid function, along with calcium and Alfacalcidiol for hypoparathyroidism caused by the surgery. The patient continues to be closely monitored and is on a regimen of suppressive T4 therapy (125 µg/day), calcium (1.25 g/day), and alfacalcidiol (1.4 µg/day), aimed at managing his condition and mitigating the spread of cancer[24, 25].

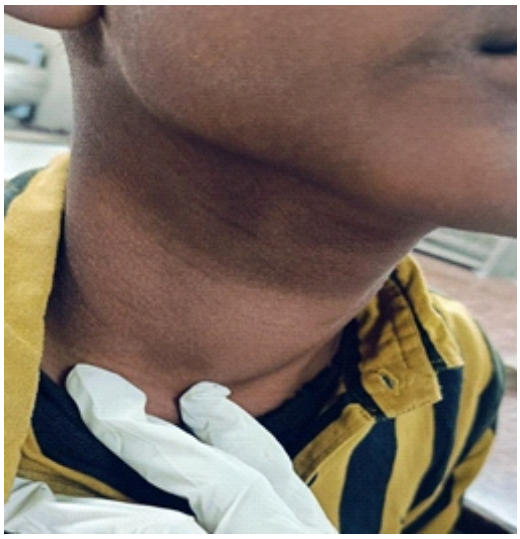

Figure 1: Swollen Lymph Nodes

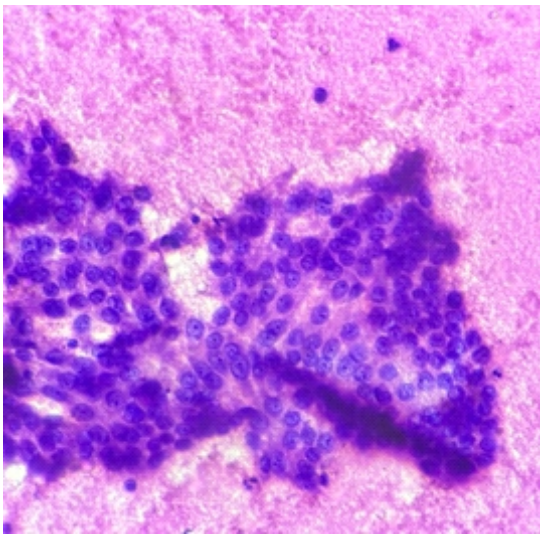

Figure 2: FNAC (40X)

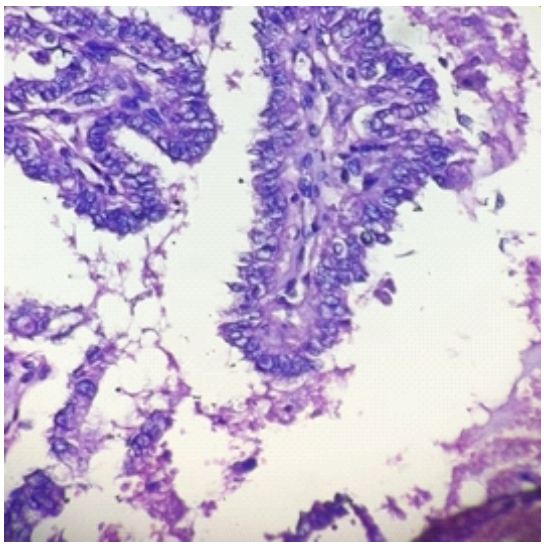

Figure 3: Histopathology (40x)

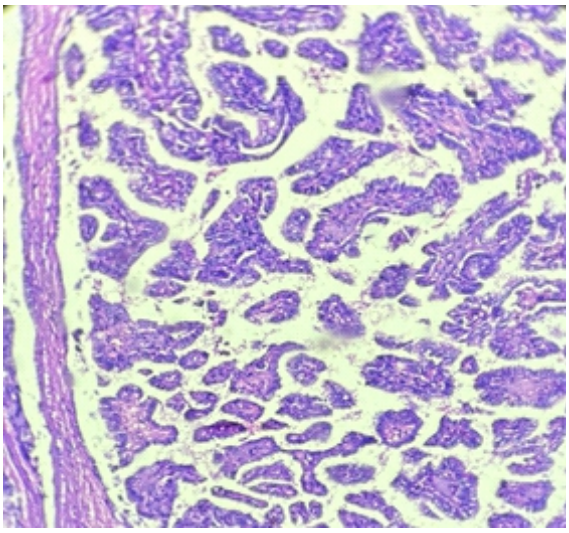

Figure 4: Histopathology (20x)

CONCLUSION

Thyroid cancer during childhood is an uncommon occurrence, particularly when it manifests as a diffuse infiltration throughout the thyroid gland. The rarity of this disease in young patients often leads to challenges in timely diagnosis and management. When thyroid cancer presents in this manner, the entire thyroid gland may appear irregular and enlarged, indicating a pervasive spread of the cancerous cells. In cases where there is an involvement of the lymph nodes, referred to as lymphadenopathies, the likelihood of thyroid cancer increases. Lymphadenopathies are significant because they often indicate an underlying systemic issue, such as an infection or, more seriously, cancer. The swollen lymph nodes, especially those located around the neck area, can be a critical clue in diagnosing thyroid cancer in children. Typically, the presence of microcalcifications within the thyroid gland is a significant indicator of papillary thyroid carcinoma, the most common type of thyroid cancer in both adults and children. These tiny calcium deposits show up as bright spots on an ultrasound, helping to pinpoint areas of potential malignancy. However, their absence does not definitively rule out the disease. In pediatric patients, the absence of microcalcifications complicates the diagnostic process, requiring clinicians to rely on other diagnostic tools and indicators, such as the physical examination of the thyroid gland, detailed medical imaging like ultrasound or MRI, fine needle aspiration cytology and histopathological examination . It is crucial for medical professionals to maintain a high index of suspicion for thyroid cancer in children presenting with diffuse thyroid infiltration and lymph node involvement, even when microcalcifications are not observed. This understanding emphasizes the need for thorough evaluations and perhaps a more aggressive diagnostic approach when typical signs are absent. Recognizing the potential for thyroid cancer in the presence of diffuse gland infiltration and lymph node swelling, without the confirmation of microcalcifications, is essential for early

CONFLICTS OF INTEREST

Authors declared that there is no conflict of interest.

FUNDING

None

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All necessary consent & approval was obtained by authors.

CONSENT FOR PUBLICATION

All necessary consent for publication was obtained by authors

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