A RARE CASE OF PAPILLARY CARCINOMA OF THYROID IN A YOUNG FEMALE: A CASE REPORT

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Abstract

Background: The papillary carcinoma thyroid is a rare disease in adolescents and children. A high level of suspicion should arouse as soon as the physician comes across swelling in neck. Appropriate management yields a good survival rate.

Case history: We present a case of the papillary carcinoma thyroid in a 13-year old girl presented to outdoor of Jinnah Hospital, Lahore with painless swelling in right side of neck for three months. There were associated smaller swelling matted on palpation. No history of palpitations, fever, weight loss and family history of tuberculosis contact or cancer in family. Initial radiology and blood investigations showed an euthyroid goitre. The fine needle aspiration of lymph node only showed reactive hyperplasia. The matted lymph node was partially excised for histopathology as suspicion of tuberculosis existed due to its endemic feature. Later, it was found to be papillary carcinoma of thyroid. Total thyroidectomy was done with neck dissection followed by treatment at nuclear medicine department.

Conclusion: Thyroid cancer is quite uncommon in adolescents but strong suspicion should arise when dealing with neck swelling even in this age group. Thorough history, watchful physical examination and timely investigations can save clinician from missing the diagnosis.

Keywords: Papillary carcinoma thyroid, total thyroidectomy, adolescents, Rare, Tuberculosis

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Papillary carcinoma of thyroid (PTC) is quite uncommon in children and adolescents. Among all malignancies in this age group, PTC ranges around only 1.5% to 3%. Below the age of 21 years, almost 10% of all thyroid malignancies occur.[1] Metastasis of papillary carcinoma of thyroid into lymph nodes is quite a common feature in children.[2] Thyroid swelling and enlarged cervical lymph nodes are presenting symptoms of this disease. The prognosis of papillary carcinoma in thyroid, however, is favorable despite local or regional recurrence.[3] The risk factors for development of thyroid cancers include high dose radiation exposure. These radiations cause changes in genes that may cause neoplastic transformation.[4-7] The papillary thyroid cancer in children is featured by large tumor size, more incidence of metastasis out of thyroid and also lymph nodal metastasis. The present treatment strategies of thyroid cancer management were issued first by American Thyroid Association (ATA) in 2015. They are mainly borrowed from adult treatment due to rarity in adults.[8]

The current treatment recommendation is the total thyroidectomy followed by radioiodine therapy, based on good response and high disease-free survival rate for this age group.[4] Almost eleven percent of the patients can develop recurrent disease during their lifetime. The survival is 93% at 1 year and 87% at 5 years.[7] Hence, with earlier diagnosis and appropriate timely management, the young patient can have quite chances of survival.[7] To date, we lack official data of such carcinomas in our population. We report here a case of papillary thyroid carcinoma in a 13-year old young girl.

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Case Presentation

A 13-years old girl presented in surgical Out-Patient department of Jinnah Hospital, Lahore in July 2021 with complaint of multiple swellings in neck for three months. The swelling on front right side of neck was painless and gradually enlarging. She also complained of dysphagia for 1 month. There was no history of dyspnea, stridor, and lethargy or weight loss. No history of neck irradiation in past or history of goiter in family. There was no history of contact with tuberculosis patient.

On examination, she was a young enthusiastic girl who was afebrile, had a heart rate of 75 per minute and rest vitals were stable. There was a large swelling measuring 10×7cm in front of neck, more obvious on right side, which was moving with deglutition. Swelling was firm to hard in consistency. There were multiple other ipsilateral swellings in neck. Temperature of skin was normal. There was no retrosternal extension of this swelling. Multiple enlarged hard lymph nodes at level II, III and IV of neck on right side were palpable; the largest of size 5×4 cm at level II. They seemed to be matted together. Her body mass index was 16.1 Kg/m^2 and ECOG status was 1.

On investigations, patient was euthyroid pre-operatively. Complete blood count and all other baseline investigations were also normal. Pre-operative thyroglobulin level was 100 ng/ml. Fine needle aspiration cytology of thyroid showed multinodular goitre. Fine needle aspiration of lymph node showed reactive hyperplasia. Being a young female and since tuberculosis is endemic in our population, there was a strong suspicion of tuberculosis, therefore excision biopsy of lymph node was planned. Surprisingly, excision biopsy of lymph node showed a papillary carcinoma.

The computed tomography scan was done to plan for the surgery. It showed multiple discrete, matted lymph nodes on both sides of neck, largest on right side measuring 3×3.8 mm. There were some nodes visible even in anterior mediastinum. There was asymmetrical, heterogeneously enhancing enlarged thyroid and isthmus. The enlarged thyroid was also present retrosternally but no compression existed.

Total thyroidectomy with selective (central and anterolateral) neck dissection was done. Right lobe of thyroid was about 5×6 cm and was hard in consistency. Right-sided inferior thyroid artery was displaced infe-riorly. On right side, there was severe desmoplastic reaction of tumor due to which trachea and esophagus were adherent to it. Left lobe was normal looking. Multiple enlarged lymph nodes were present in level II, III, IV and VI. The largest lymph node was at level III that was about 3×4 cm. Patient had an uneventful recovery. Drains were removed on second post-opera-tive day and discharged from ward on third post-opera-tive day. The patient was not given any thyroxine to render her euthyroid. Later her thyroid scan showed small residual tissue for which she was referred to nuclear medicine for radio-iodine ablation.

Figure 1: *Preoperative photograph of swelling of patient*

Figure 2: *Post-operative photograph of patient*

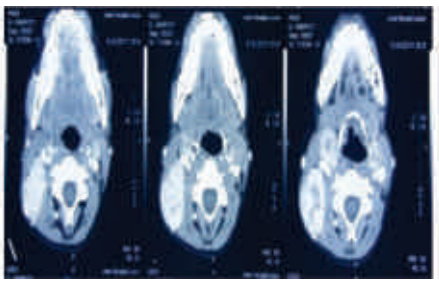

Figure 3: *CT scan of neck showing right sided cervical lymph adenopathy and also enlarged right lobe of*

thyroid

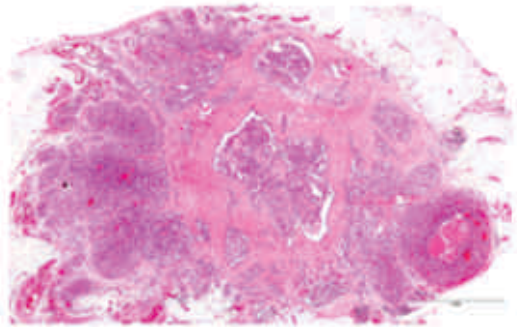

Figure 4: *Biopsy of lymph node showing papillary carcinoma*

Footnote: Pictures were taken after obtaining permission from patient and her parents.

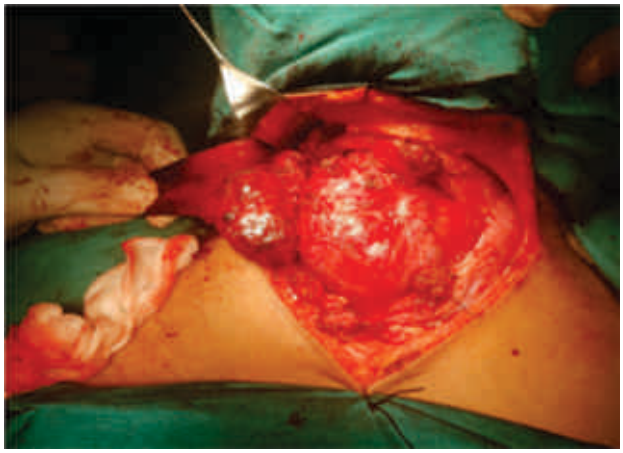

Figure 5: Intraoperative picture with thyroid exposed

DISCUSSION

The incidence of thyroid cancers has increased over time not only affecting adults but also children and adolescents. It is overall a rare tumor but among the endocrine tumors, it is the most common one. Thyroid cancers account for almost 0.5 to 1.5% of all cancers in adolescent age group. The differentiated thyroid cancers are most common type of all thyroid cancers. Their incidence is 0.02 to 0.3 per 100,000 children.[5] The children and adolescents who have locally advanced tumours tend to have a good prognosis as compared to adults with same extent of disease. The survival long-term is for decades particularly if there is no distant metastasis. The literature suggests to completely excise the tumour by a high-volume thyroid surgeon to increase the survival, especially disease-free. Such patients may not even require radioactive iodine (RAI), if distant metastasis do not exist. The patient should be counselled to follow up regularly with serum thyroglobulin levels and neck ultrasound.[10]

Most of the thyroid cancers in pediatric population are differentiated thyroid cancers which arise from thyroid follicular cells in 95% cases. Out of these, most common are papillary carcinomas accounting for 90% cases and the rest are follicular (9%). Medullary carcinoma thyroid arises from thyroid C-cells.[12] There occur wide changes in genes and lesser point mutations in proto-oncogenes in PTC. Some rearranged oncogenes include RAS, RET, TRK and p53. The radiation to neck and head are other risk factors. The ATA has subdivided PTC into pre and post-pubertal PTC.[15,16]

We reported here a rare case of papillary thyroid carcinoma in a 13- year old girl. Her presentation was with multiple neck swellings, but due to younger age group, most of our suspicion was directed towards tuberculosis. The lymph node biopsy actually done to confirm our diagnosis of granulomatous inflammation came out to be metastatic thyroid carcinoma. A key point that leads to diagnosis of PTC in children is lymphadenopathy. The lymphadenopathy, like in our case, can be very difficult to differentiate whether caused by metastasis of PTC or reactive to tuberculosis. The added toll comes when the radiology does not help in diagnosing infective or metastatic pathology.[9] A thorough examination and histopathology is crucial to such cases. Total thyroidectomy followed by radio-iodine therapy is the treatment of choice in such patients.

The patient should be investigated starting from baseline complete blood count, thyroid function tests. The initial investigations include ultrasonography and fine-needle aspiration cytology. The ultrasound focuses on suspicious nodules. But as in our case, if suspicion of malignancy is high, we can perform excisional biopsy. Staging workup include whole body CT scan.[13] No staging system for post-operative staging has been standardized yet. The most frequently used system is TNM classification to determine the mortality. There is a limitation that all adolescents having no

distant metastasis still fall under stage I. American Thyroid Association proposed the risk classification for pediatric population.[11]

The treatment for PTC even in earlier stages remains total thyroidectomy even if no extra-thyroidal spread exists. This is preferred over lobectomy as it gives good regional control and removal of multifocal spread. Thus, recurrence rate also decreases. The surgery should be performed by dedicated thyroid surgeon so lesser complications occur like nerve damage, hypoparathyroidism and hemorrhage. Then, radioactive iodine may be given for further ablation of residual tissue.

CONCLUSION

The papillary thyroid cancer is rare pathology in adolescents but its existence cannot be neglected. Hence, appropriate management is required to avoid misdiagnosing such neck swellings.

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REFERENCES

1. Palaniappan R, Krishnamurthy A, Rajaraman SS, Kumar RK. Management outcomes of pediatric and adolescent papillary thyroid cancers with a brief review of literature. Indian Journal of Cancer. 2018 Jan 1; 55 (1):105.
2. Xu Y, Wang Y, Zhang X, Huang R, Tian R, Liu B. Prognostic value of lymph node ratio in children and adolescents with papillary thyroid cancer. Clinical Endocrinology. 2021 Oct;95(4):649-56.
3. Cho JS, Yoon JH, Park MH, Shin SH, Jegal YJ, Lee JS, Kim HK. Age and prognosis of papillary thyroid carcinoma: retrospective stratification into three groups. Journal of the Korean Surgical Society. 2012 Nov 1; 83(5):259-66.
4. Vaisman F, Corbo R, Vaisman M. Thyroid carcinoma in children and adolescents-systematic review of the literature. Journal of Thyroid Research. 2011 Jan 1; 2011.
5. Loizou L, Demetriou A, Erdmann F, Borkhardt A, Brozou T, Sharp L, McNally R. Increasing incidence and survival of paediatric and adolescent thyroid cancer in Cyprus 1998–2017: A population-based study from the Cyprus Pediatric Oncology Registry. Cancer Epidemiology. 2021 Oct 1;74:101979.
6. Khan SA, Khan MM, Kamin M, Rizwan A. Thyroid Papillary Carcinoma and Hyperthyroidism: A Case Study.2021. EMJ Oncol. 2022; DOI/10.33590/ emjoncol/ 21-00176.
7. de Jong MC, Gaze MN, Szychot E, García VR, Brain C, Dattani M, Spoudeas H, Hindmarsh P, Abdel-Aziz TE, Bomanji J, Shankar A. Treating papillary and follicular thyroid cancer in children and young people: Single UK-center experience between 2003 and 2018. Journal of Pediatric Surgery. 2021 Mar 1;56(3):534-9.
8. Su Y, Cheng S, Diao C, Ma Y, Qian J, Cheng R. Surgical treatment of pediatric and adolescent papillary thyroid cancer: a retrospective study of 54 patients in a single center. Jornal de Pediatria. 2022 Feb 6.
9. Mohan N, Chia YY, Ng CF, Iyer GN, Tan HK, Tan NC, Radhziah S. Lymph Node Metastasis from Papillary Thyroid Carcinoma or Tuberculous Lymphadenitis: A Diagnostic Dilemma. International Journal of Head and Neck Surgery. 2018 Apr 1;8(3):121-4.
10. Bottomley SJ, Waguespack SG. An Adolescent with Papillary Thyroid Carcinoma and Locally Metastatic Disease but No Distant Metastases in Thyroid Cancer 2021 (pp. 93-102). Springer, Cham.
11. Sapuppo G, Hartl D, Fresneau B, Hadoux J, Breuskin I, Baudin E, Rigaud C, Guerlain J, Al Ghuzlan A, Leboulleux S, Schlumberger M. Differentiated Thyroid Cancer in Children and Adolescents: Long Term Outcome and Risk Factors for Persistent Disease. Cancers. 2021 Jul 24;13(15):3732.
12. Cherella CE, Wassner AJ. Pediatric thyroid cancer: Recent developments. Best Practice & Research Clinical Endocrinology & Metabolism. 2022 Nov 7:101715.
13. Fernández DY, Amenabar EV, Muñoz AC, Vallejo LA, León MC, Planes-Conangla M, Felip CI, Álvarez CS, Burrieza GG, Campos-Martorell A. Ultrasound criteria (EU-TIRADS) to identify thyroid nodule malignancy risk in adolescents. Correlation with cytohistological findings. Endocrinología, Diabetes y Nutrición (English ed.). 2021 Dec 1;68(10):728-34.
14. Zdravkovic V. Update on the management of pediatric thyroid cancer. International Journal of Pediatrics and Adolescent Medicine. 2018;1:1-5.
15. Pekova B, Sykorova V, Dvorakova S, Vaclavikova E, Moravcova J, Katra R, Astl J, Vlcek P, Kodetova D, Vcelak J, Bendlova B. RET, NTRK, ALK, BRAF, and MET fusions in a large cohort of pediatric papillary thyroid carcinomas. Thyroid. 2020 Dec 1;30(12): 1771-80.
16. Elsayed WA, Hamed MA, Ali RA, Bakheet RA. Pediatric Differentiated Thyroid Cancer: Our Experience. Cureus. 2019 May 17;11(5).