

Nasopharyngeal Metastasis of Papillary Thyroid Carcinoma An Unusual Site of Distant Metastasis: A Case Report

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Abstract

Background: Papillary thyroid carcinoma (PTC) despite of an indolent clinical behavior is known to cause locoregional recurrence and distant metastasis. Lung and bone are the common site of distant metastasis. Nasopharynx is a very rare site of metastasis.

Figure 1

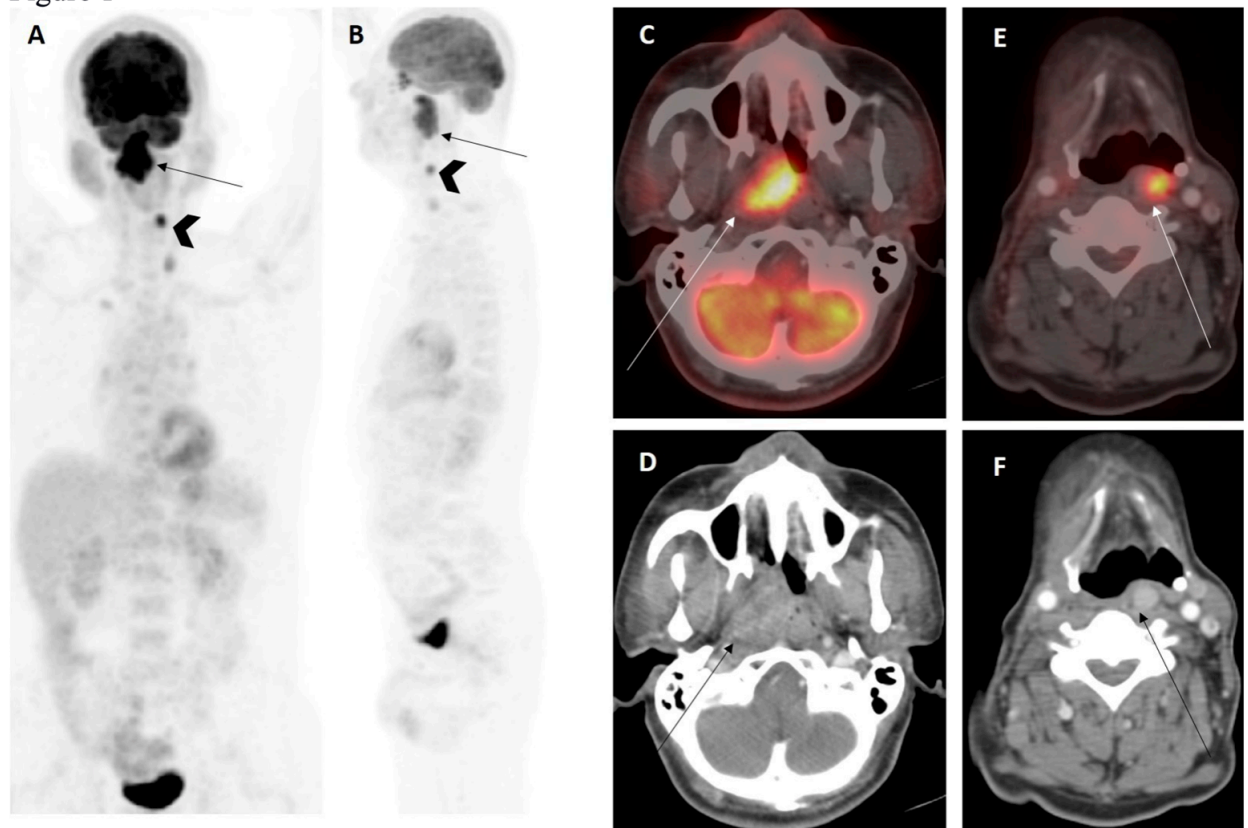


Figure 1. Figure A & B: Anterior and lateral view of FDG PET MIP (maximum intensity projection) Figure showing focal abnormal tracer concentration in nasopharyngeal region (arrow) and neck region (arrowhead). Figure C: Fused PET/CT Figure showing increased tracer uptake in right lateral and posterior wall of nasopharynx (arrow). Figure D: CECT Figure showing enhancing soft tissue mass in nasopharynx (arrow). Figure E: Fused PET/CT Figure showing increased tracer uptake in left retropharyngeal region (arrow). Figure F: CECT Figure showing enhancing left retropharyngeal node (arrow)

Methods: Case report

Results: A case is discussed in which patient was diagnosed with PTC and had undergone total thyroidectomy with lymph node dissection with subsequent radiotherapy. Patient presented with nasopharyngeal metastasis within 3 years of diagnosis.

Conclusion: Classic PTC can cause recurrence in the form of metastasis in distant rare sites including nasopharynx. It is necessary to keep patients in regular frequent follow-up after initial management especially when associated with high risk factors.

Keywords: Nasopharynx, papillary thyroid carcinoma, thyroidectomy, radiotherapy, distant metastasis

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Introduction

Papillary thyroid carcinoma (PTC) is a follicular cell-derived malignant neoplasm of the thyroid with distinct nuclear features. PTC is the most common endocrine malignancy both in the adult and paediatric population. PTC is an indolent malignancy with long-term survival rate of 90% at 20 years (1). Another follicular cell-derived malignancy of the thyroid is follicular thyroid carcinoma (FTC). They have a follicular arrangement and lack the nuclear features of PTC. Papillary and follicular carcinomas of the thyroid gland are often referred to together as differentiated thyroid cancers (DTC).

Though known to have an excellent prognosis, PTC can take up an aggressive clinical course. Clinicopathological features such as age, gender, tumor size, lymph node metastases, extra-thyroidal extension, local recurrence, TNM stage, and distant metastases are considered to be prognostic factors affecting survival (2). Common sites for distant metastasis (DM) are lung and bone. Other sites of DM that have been reported are the liver, brain, skin, skeletal muscle, ovaries, oropharynx, submandibular gland, sphenoidal sinus, adrenal gland, and pancreas (3). The nasopharynx is a very rare site of metastasis for PTC. Patients presenting with distant metastasis have less favorable outcomes (2,3).

Thyroid-like low-grade nasopharyngeal papillary adenocarcinoma is a very rare nasopharyngeal tumor, occurring in a wide age range and with no gender predilection. It is a very close mimicker of PTC. Immunohistochemistry using PAX8 and thyroglobulin antibodies helps in differentiating both tumors (4). We present this case report in accordance with CARE reporting guidelines.

Case Presentation

A 50-year-old male was diagnosed with PTC and was operated on in August, 2021. The final histopathology of total thyroidectomy was reported as Classic PTC with multiple ipsilateral lymph node metastases (Pathology TNM stage pT3bN1bM0). The tumor was located in the right lobe of the thyroid and measured 10 x 7.3 x 5.7 cm. The tumor showed both lymphatic and angioinvasion and was seen involving the strap muscles. The patient underwent radiotherapy and was kept on follow-up. After 2 years, the patient presented with symptoms of nasal obstruction. Upon evaluation was found to have a mass occupying the nasopharynx. Whole-body PETCT showed uptake in the retropharyngeal lymph nodes as well as nasopharyngeal mass (Fig. 1). Biopsy of the lesion showed features suggestive of metastasis from PTC with positivity for PAX8,

Thyroglobulin and TTF1 on IHC (Fig. 2 and 3). No other distant site of metastasis was noted. The patient received radiotherapy and is on follow-up.

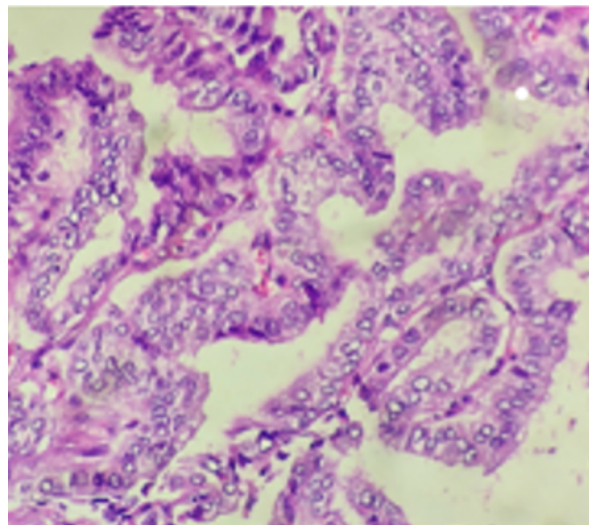


Fig. 2. 40X magnification of hematoxylin and eosin section of nasopharyngeal papillary thyroid carcinoma metastasis

Discussion

PTC comprises 80%-85% of adults, and 90% of all paediatric thyroid malignancies and its incidence has been increasing over the past few decades. Despite an indolent clinical course, PTC is known to have adverse clinical behavior. Histological subtypes that have aggressive outcomes are diffuse sclerosing, tall cell, columnar cell, solid, and hobnail subtypes (5). The overall recurrence rate in PTC is approximately 15-35% with recurrence seen in tumor bed, cervical neck lymph nodes, or rarely distant sites (6). Cervical nodal metastases can occur in about 60% of patients with PTC. Distant metastases are more commonly seen in patients with FTC and less commonly seen in PTC (10% of patients). This difference is attributed to the more lymphatic invasion seen in PTC and more hematogenous invasion in FTC (7).

Risk factors for DM include male gender, advanced age, histologic type, completeness of removal of the primary tumor with a negative margin, extrathyroidal extension, and lymph node metastasis at the time of diagnosis. Common sites of distant metastasis are lung and bone. Single-organ metastasis is more commonly seen at the time of presentation than multiorgan metastasis. Metastasis to the brain and liver has shown the worst prognosis with a significant decrease in survival (2,8).

Apart from cervical lymph nodes, other sites of DTC metastasis in the head and neck region are

the retropharyngeal space, parapharyngeal space, nasal cavity, and paranasal sinus (9). The nasopharynx is a rare site for distant metastasis from DTC and is limited in the literature to case reports. A review of the literature until March 2024 yielded only three cases of DTC metastases to the nasopharynx (10-12). Among three, two were of PTC and one was FTC. TS Patel et al reported a case of FTC metastasis to the nasopharynx. The patient was a 52-year-old female managed with near-total thyroidectomy 6 years back for FTC. The patient presented with nasal discharge

the patient was lost to follow-up (11). Xu A. et al reported a case that was initially evaluated for suspicious nasopharyngeal carcinoma later on histopathology evaluation was determined to be metastasis from PTC after 4 decades (12).

Tian L et al reported an unusual case of papillary thyroid carcinoma arising in an ectopic thyroid tissue with adenoid hypertrophy. The patient was a 16-year-old girl who presented with symptoms related to adenoid hypertrophy. Nasal endoscopy showed a pedicled mass located in the posterior

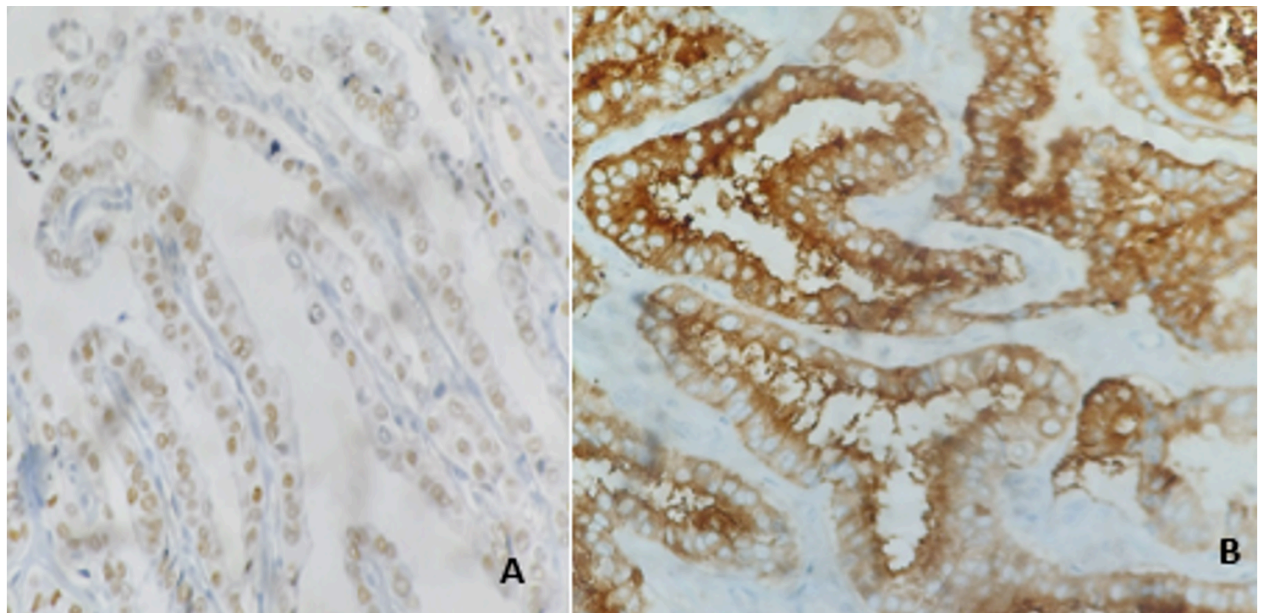


Fig. 3 A) 40X magnification of immunohistochemical stain showing tumor cell positive for PAX8. - B) 40X magnification of immunohistochemical stain showing tumor cell positive for thyroglobulin

and stiffness of one-month duration. CT scan of the brain with paranasal sinus showed a nasopharyngeal mass with bone erosion and intracranial metastasis. Histopathology showed extensive clear cell change and was first thought to be renal cell carcinoma metastasis. However, immunophenotyping showed positivity for thyroglobulin (Tg) in all tumor cells (10). The two cases of PTC metastasis to the nasopharynx were of females in their 6th decade. In both cases, there was a significant time gap between initial diagnosis and DM. Limpawittayakul P et al reported a case of DM of PTC origin after 21 years of initial diagnosis and treatment by left hemithyroidectomy. This patient presented with right-sided epistaxis and CECT showed a nasopharyngeal mass with extensive local spread with lateral retropharyngeal node with features suggestive of extranodal extension. She also had lung and pleural metastasis. IHC showed CK7, TTF1, and thyroglobulin positivity. She was managed with a completion thyroidectomy with lymph node dissection and the patient was planned for radioactive iodine therapy post-operatively but

wall of the nasopharynx. Endoscopic-assisted tumor resection was performed. Histopathology showed ectopic thyroid tissue with PTC arising from it. IHC showed positivity for TTF1, CK, and Tg. On further workup thyroid gland was normal and no cervical lymphadenopathy was noted. However, the patient didn't undergo thyroidectomy or radioactive therapy (13). Our patient is an elderly man, with a large primary tumor with extrathyroidal extension, and lymph nodal metastases. The patient had received radiotherapy post-surgery. The patient had extensive locoregional disease at the time of initial presentation and this could be the reason for possible early DM in this case.

PTC metastasis is essential to differentiate from thyroid-like low-grade papillary adenocarcinoma of the nasopharynx. This is a rare tumor with no gender predilection occurring in a wide age range. Histopathological examination shows complex arborizing papillae with fibrovascular core and nuclear features of PTC. IHC shows CK7 and TTF1 positivity but negative for PAX8

and Tg. They do not have a defined genetic alteration to date and surgical resection is curative (14).

In general primary modality of treatment of nasopharyngeal malignancy is radiotherapy for early stages and combined chemoradiotherapy for late stages (15). In the case of nasopharyngeal DM other tumor-targeted therapy may be considered.

Conclusion

The Nasopharynx as a distant site of metastasis from papillary thyroid carcinoma is very rare. Lung and bone are the most common sites of metastasis. This is the third reported case of nasopharyngeal metastasis of PTC. Regular follow-up is imperative in classic PTC, especially in patients with extensive locoregional disease and other high-risk factors.

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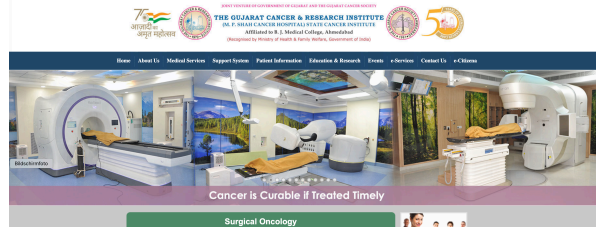
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