Case Report

An Unusual Case of Follicular Variant of Papillary Thyroid Carcinoma with Temporal Bone Metastasis Diagnosed by Cytology

Poonam G Lahane*, Prashant Kumavat, Kavita Khedekar, Nitin M Gadgil and Chetan S Chaudhari

Dept. of Pathology, LTMMC & LTMGH, Sion, Mumbai. India

Keywords: *FNAC, Follicular, Metastases, Papillary, Thyroid, Skull*

ABSTRACT

Skull metastasis of thyroid cancer is rare and majorities are of the follicular subtype, rather than papillary thyroid carcinoma. Here, we present a case of follicular variant of papillary thyroid carcinoma (FVPTC) with temporal metastasis. A 45yrs female presented with thyroid swelling since 8 months and scalp swelling since few days. Fine needle aspiration of thyroid and scalp swelling as well showed features of FVPTC. On CT examination, there was focal osteolytic erosion suggestive of lytic bone metastasis. Histopathological examination after total thyroidectomy confirmed a diagnosis of papillary thyroid carcinoma follicular variant involving regional lymph nodes.

Skull metastasis should be considered at the outset of the clinical course of thyroid carcinoma and all patients should be meticulously investigated with a multidisciplinary approach as if detected early it improves the prognosis. Fine needle aspiration cytology (FNAC) and histopathology plays key role in diagnosis along with radiological and clinical examination correlation.

***Corresponding author:**
Dr. Poonam G. Lahane, F2/5 D.A.D Residential Complex, Kanjurmarg West, Mumbai, Maharashtra, INDIA. Pincode:400078
Phone: +91 9920825352
E-mail: poonamlhn2@gmail.com

Introduction

Thyroid carcinomas are relatively less common comprising approximately 1.1% of all carcinomas, and 0.2% of all carcinoma deaths.[1] Among these, differentiated thyroid carcinomas (DTC) comprising papillary and follicular thyroid carcinoma subtypes, represent more than 90% of all thyroid carcinomas. Papillary thyroid carcinoma (PTC) is the most common type of DTC and FVPTC is one of the variants of PTC. PTC is indolent in nature, as it is typically low-grade and slowly progressive. Hence, the prognosis is usually favorable with high survival rate. FVPTC shows similar prognosis as that of PTC but with greater risk of vascular invasion and distant metastasis. The most frequently occurring metastasis affects the cervical and mediastinal nodes while distant metastasis goes to lung and bone. Bone metastases are most likely to occur in the scapula, sternum and ilium and rarely in the skull.[1]

Differential diagnosis of osteolytic skull metastases are often from primaries of lung, breast and prostate malignancies rather than thyroid carcinoma. Around 2.5% to 5% of cases of thyroid cancers may present with skull metastasis.[2] Here we report an unusual case of FVPTC with temporal bone metastasis at initial presentation.

Case Report

45year female patient presented to us with anterior neck swelling since 6 years (Fig.1) which was progressively increased in size since last 8 months with scalp swelling over left temporal region since few days. Scalp swelling was soft 2cm in diameter hemispheric tumor. Patient had no history suggestive of hypothyroidism, hyperthyroidism, or blood pressure symptoms. Neck swelling was more prominent on left side with firm to hard on palpation and moving with deglutition. Thyroid function test was normal. Ultrasound of neck showed enlarged left lobe with a heterogeneous hypoechoic nodule (size of 3.1 cm) and two such nodules in right lobe of thyroid (largest of size 1.4 cm) reported as colloid nodules, and left cervical lymph node mass likely to be metastases. Subsequently patient underwent fine needle aspiration cytology (FNAC) of hypoechoic thyroid nodule which showed thyroid epithelial cells arranged in papillae and in microfollicles at places with nuclear overlapping, granular chromatin, nuclear grooves and nuclear clearing, diagnosis offered as FVPTC Bethesda VI. (Fig.2).

To map the disease burden, contrast enhanced computerized tomography(CT) of skull to pelvis was done which showed solitary lytic bone metastasis in squamous part of temporal bone with left cervical level V lymph node metastases (lung was normal).

FNAC of cervical lymph nodes and temporal bone lesion (scalp swelling) shown the similar picture as that of thyroid FNAC, suggesting the diagnosis of FVPTC metastases (Fig.3). Total thyroidectomy with left sided modified neck dissection was done. Histopathology report of thyroid specimen given was differentiated papillary carcinoma thyroid follicular variant involving right and left lobe with regional lymph node metastases (Fig.4). For the management of metastatic lesion patient received radioactive iodine therapy (RAI). After receiving RAI therapy size of temporal bone lesion was reduced significantly.

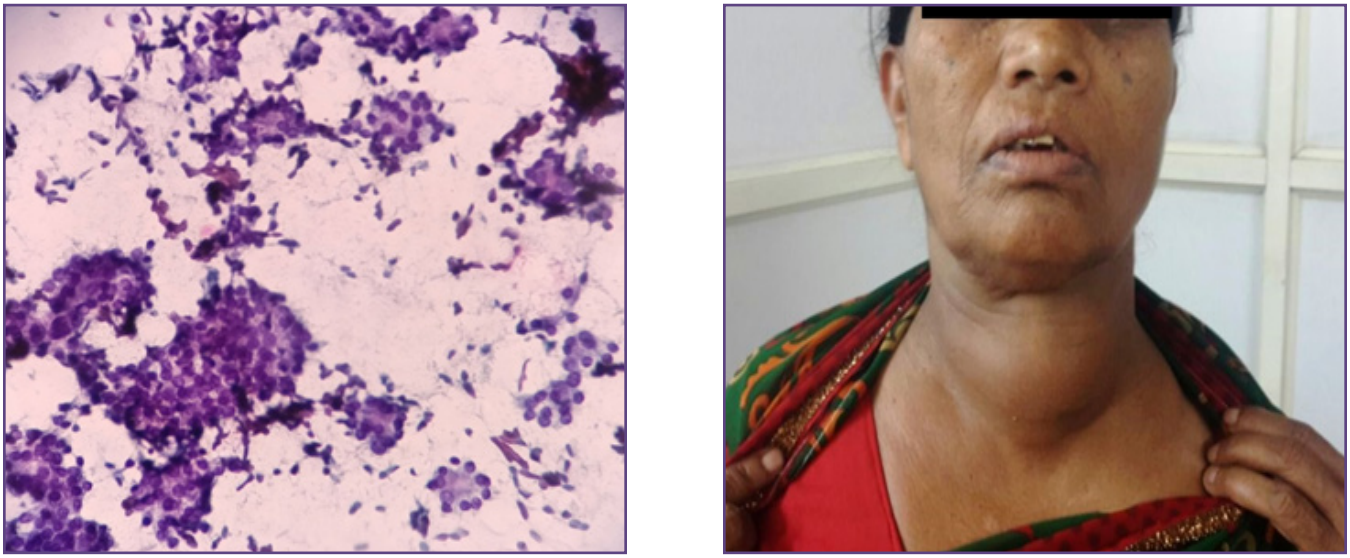

Fig. 1: Neck swelling more on left side.

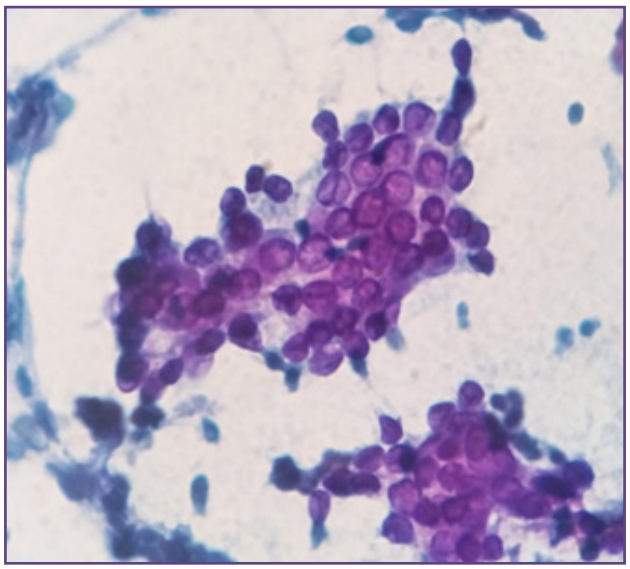

Fig. 2: Thyroid FNAC-(Papanicolaou stain) Thyroid follicular epithelial cells arranged in papillae and follicles with nuclear enlargement, fine powdery chromatin, nuclear groves and intranuclear clearing.

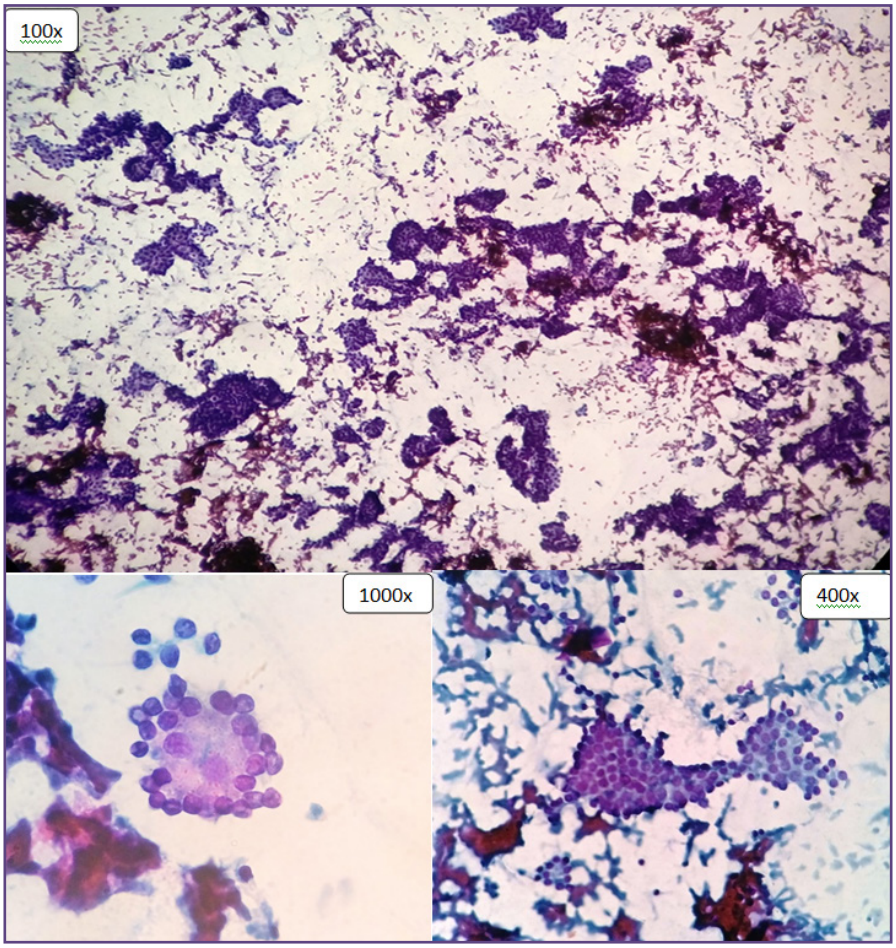

Fig. 3: Scalp swelling FNAC –(Papanicolaou stain) Thyroid follicular epithelial cells arranged in papillae and microfollicles shows nuclear overlapping, powdery fine chromatin, nuclear groves, and intranuclear inclusions.

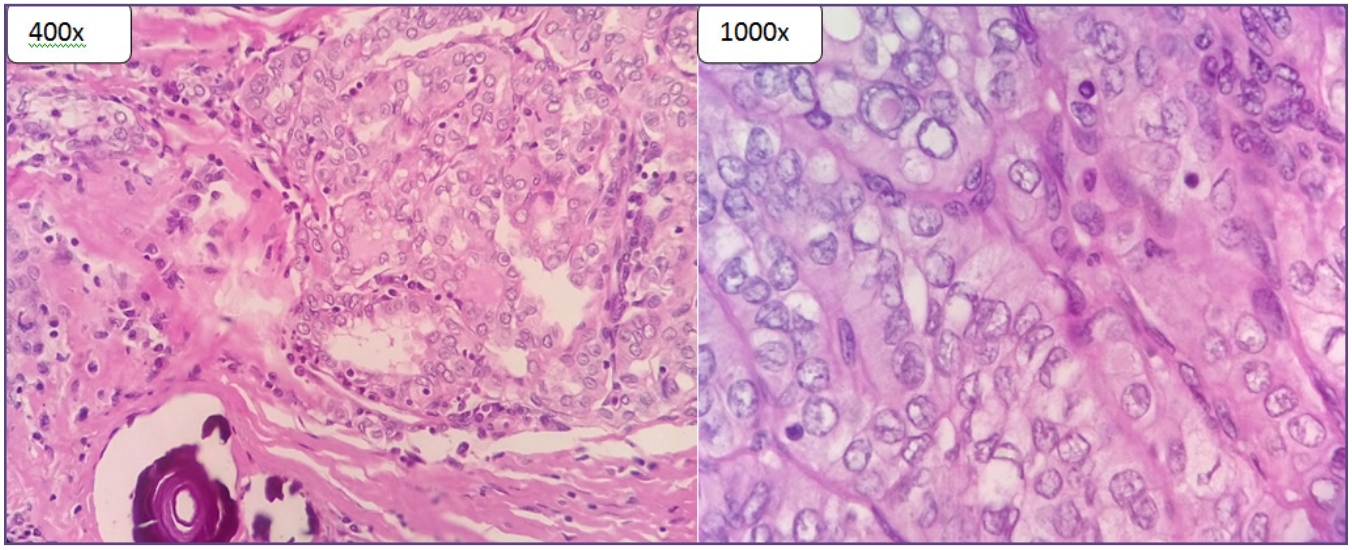

Fig. 4: H&E stained section from thyroid nodules shows tumour composed of follicles with nuclear features of PTC i.e nuclear clearing, powdery chromatin, nuclear groves, and intranuclear inclusions. Occasional psammoma bodies seen.

Discussion

Thyroid tumours are more prevalent in females with a female to male ratio of 2.6:1.[2] Papillary carcinoma of thyroid is the most common type of thyroid cancer, accounting for 70%-90% of well differentiated thyroid malignancies. While incidence of FVPTC is difficult to determine as it was misdiagnosed in past as follicular adenoma or follicular carcinoma in some cases.

Usually, thyroid carcinoma presents with a neck mass which can be solitary or multinodular. The incidence of metastases to the bone from thyroid carcinoma has been reported from 1% to more than 40%, forming the second most common site following lung involvement. The initial presentation of distant metastases (3-4%) in patients with DTC is a rare event. However, as reflected in this case report, thyroid carcinoma may present with asymptomatic bone metastases and should be considered amongst the potential differential diagnoses.[3] Skull metastases from thyroid cancers are usually soft, hemispheric tumours resting on the skull as seen in our case. These tumours are usually highly vascular, with evident osteolytic changes in the skull.[2]

In literature, follicular carcinomas have been reported to show a greater prevalence to distant metastases than other subtypes of DTC. This may be attributed to the generic use of the term follicular carcinoma prior to the recognition of specific sub-types, including FVPTC. Although, FVPTC is thought to behave in a similar clinical manner to true papillary thyroid carcinoma, in some cases it may present with the pathologic features and clinical behavior similar to that of follicular carcinoma.[3]

However, the relatively recent studies by Wood et al,[4] Ruegemer et al,[5]and Mizukami et al[6] report a much higher relative incidence of papillary carcinoma among their cases with bone metastases (41%– 77%), as seen in our case. This relatively higher incidence may be due to overwhelming majority of PTCs amongst thyroid cancers. [7]

10-year survival rate of patients with DTC is 80–95% while it is reduced to 40% in presence of distant metastases.[8] Early detection of bone metastasis improves the prognosis. [3] This means presence of bone metastasis worsens the prognosis which can be prevented by early detection.

The mean period from the initial diagnosis of thyroid papillary carcinoma until the detection of skull metastasis has been reported as 23.3 years.[9] in contrast to our case where we diagnosed both the conditions simultaneously. Skull is a rare site for metastases, which when they occur, are most commonly located in the occipital region presenting as a soft, painless lump [9] while in present case temporal bone involvement by metastasis indicates the rarity of presentation.

Diagnosis of a skull metastasis from thyroid carcinoma is usually based on clinical judgment, in conjunction with results of radiological investigations and biopsy findings.

Current guidelines advise bone metastases should be treated with a combination of surgery, external beam radiotherapy, and 131Iodine therapy.[10]

Conclusion

In summary, although this is a rare case, papillary thyroid malignancy follicular variant should be considered as a

potential primary malignancy in patients who present with suspicious skull metastases on initial presentation. Prompt diagnosis and appropriate treatment are essential keys to successful management. FNAC and Histopathology plays important role in the diagnosis of primary as well as metastatic skull bone tumors in case of thyroid cancer.

Abbreviations and Symbols:

- FVPTC- Follicular variant of papillary thyroid carcinoma
- CT- computerized tomography
- FNAC- Fine needle aspiration cytology
- DTC- Differentiated thyroid carcinoma
- PTC- Papillary thyroid carcinoma
- Fig.- Figure
- RAI- Radioactive iodine
- H & E – Haematoxylin and eosin

Acknowledgements
None

Funding
None

Competing Interests
None Declared

Reference
1. Li X1, Zhao G, Zhang Y, et al. Skull metastasis revealing a papillary thyroid carcinoma. Chin J Cancer Res. 2013 Oct;25(5):603-7.
2. Manju P. Antony, Meer M. Chisthi, Tessy P. Joseph, et al. Follicular carcinoma thyroid presenting as skull metastasis: a rare case report. Int J Otorhinolaryngol Head Neck Surg. 2015 Jul;1(1):40-44.
3. Siddiq S, Ahmad I, Colloby P, et al. Papillary thyroid carcinoma presenting as an asymptomatic pelvic bone metastases. JSCR.2010: 3:2.
4. Wood W,. Singletary SE, Hickey RC, et al. Current results of treatment for distant metastatic well-differentiated thyroid carcinoma. Arch Surg 1989;124:1374–1377
5. Ruegemer, JJ, Hay ID, Bergstralh EJ, et al. Distant metastases in differentiated thyroid carcinoma: a multivariate analysis of prognostic variables. J ClinEndocrinol Metab 1988; 67:501–508.
6. Mizukami Y T. Mishigishi, Nonomura A. et al. Distant metastases in differentiated thyroid carcinomas: a clinical and pathologic study. Hum Pathol 1990;21:283–290.
7. Tickoo S, Pittas A, Adler M, et al. Bone metastases from thyroid carcinoma: a histopathologic study with clinical correlates. Arch Pathol Lab Med 2000;124:1440-1447.
8. Muresan M, Olivier P, Leclere J, et al. Bone metastases from differentiated thyroid carcinoma. EndocrRelat Cancer 2008;15:37-49.
9. Nigam A, Singh AK, Singh SK, et al. Skull metastasis in papillary carcinoma of thyroid: A case report. World J Radiol2012 June 28; 4(6): 286-290
10. British Thyroid Association, Royal College of Physicians. Guidelines for the management of thyroid cancer. 2nd edition. Perros P,(ed). Report of the Thyroid Cancer Guidelines Update Group. London: Royal College of Physicians, 2007.