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Papillary Carcinoma of Thyroid Diagnosed Primarily in Frontal Bone with Occult Primary - Rare Case Report

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Abstract

Thyroid cancer is the most common endocrine cancer in the world, with a rising global incidence over the last three decades. Skull metastasis from a differentiated thyroid malignancy is a rare occurrence.

An unusual case of papillary carcinoma thyroid metastasizing in bone and brain which obscuring vision in 70-year-old female did not have any apparent primary in thyroid region. All routine investigations were normal. FNAC revealed - Benign Adnexal Tumor which was Radio logically diagnosed as- Benign Vascular lesion. Craniotomy was done and tumor sent for histopathology, revealed Papillary carcinoma Thyroid metastasizing to bone and involving to brain.

Patient referred to oncology. Finally, thyroidectomy was done which was radiologically diagnosed as colloid goiter. Histopathology revealed - Follicular variant of papillary carcinoma Thyroid (pT1N0M1). Patient has been kept on radioiodine therapy and three month follow up reveals good response to therapy.

Conclusion: The conventional therapy for metastatic PTC includes a total thyroidectomy, removal of resectable metastatic lesions and a supplementation with radioactive iodine (RAI) and/or external beam radiation at the sites of the metastases. This case and our literature review illustrate that skull metastases should be considered in the clinical course of PTC so that appropriate management can be started.

Keywords: ***Papillary carcinoma; Metastasis; Bone & brain; Histopathological examination; IHC; Radiologically***

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1. Introduction

Papillary thyroid carcinoma (PTC) is well known indolent tumor and usually confined to the thyroid, It rarely metastatise to distant organs except local regional lymph nodes (40%). Distant metastasis occurs in ~9%-14% of the cases. Common sites for metastases are lung (49%), bone (25%), and brain (12%). Vertebrae are the favorable site for bone metastasis [1]. Metastasis to skull is rarely seen and reported in literature.

We found 16 cases of PTC are reported in world literature in female that metastasized to the skull. In only two of these cases, brain infiltration was seen. In one case, neurosurgery was performed to excise metastatic tumor, but the patient died after 17 months [2,3]. The follow-up of the other patient is not known [4].

In our case also PTC which was diagnosed initially as primary brain tumor and wrongly diagnosed by us on FNAC as Benign Adnexal Tumor. Therefore, tumor excised later on diagnosed as PTC on histopathological examination. It's extreme rarity of metastastic PTC presented as primary brain tumor.

2. Case Report

A 70-year-old Female came in Opthalmology Opd with complaint of large bulging mass in frontal region measuring 10 cm × 10 cm in Anterio posterior diameter, which obscured her vision since ten years. Because of metastatic PTC infiltrating to frontal bone (Skull & Brain)

FIG. 1. **70 year old lady presented with frontal swelling since 8 years.**

3. Investigations

Patient's all routine investigations were normal.

3.1 On FNAC

Smears of moderate cellularity reveal clusters and acini formed by basaloid cells in myxomatous background patient diagnosed wrongly by us as - Benign Adnexal tumor - Cylindroma ? / Mixed Tumor?

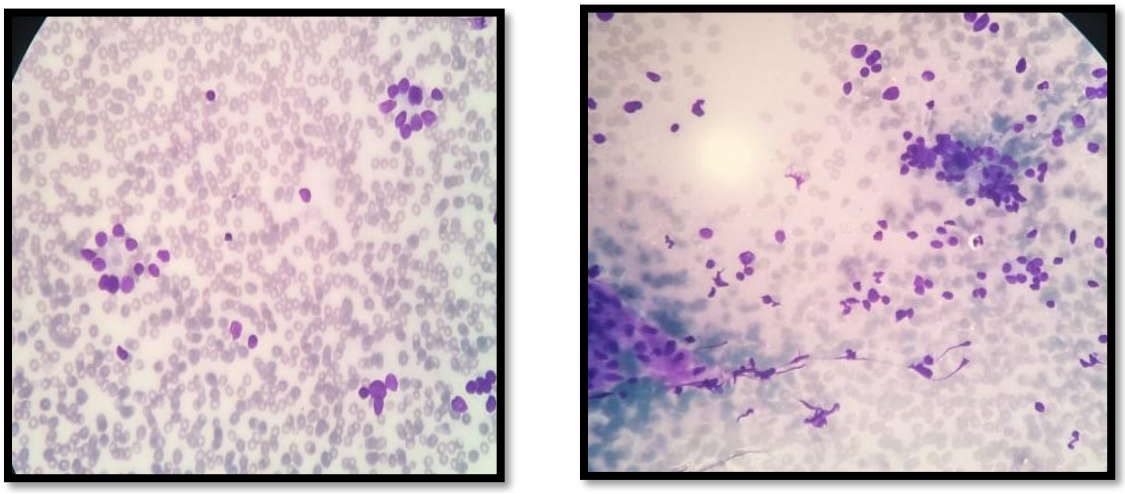

FIG. 2. **FNAC reveals clusters of epithelial cell- misdiagnosed as benign adnexal tumor.**

3.2 On radiological evaluation

CECT revealed well defined lobulated mass measuring 8.6 cm × 12.6 cm × 12.3 cm in frontal region, lesion causing destruction of both frontal bone and orbital roof with extradural extension. On radiological evaluation diagnosed as Benign vascular tumor - Hemangio pericytoma.

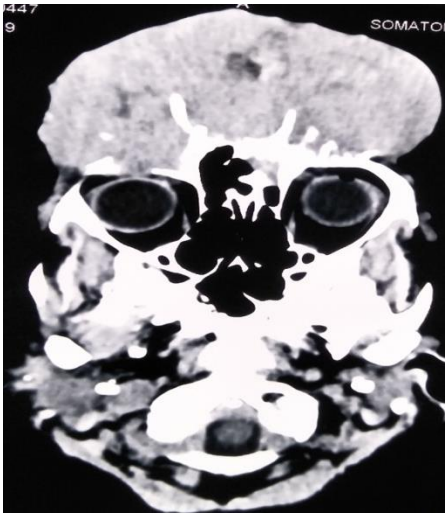

FIG. 3. **CT scan reveals growth invading the frontal lobe and obscuring the vision.**

Craniotomy done and tumor sent for histopathological evaluation and reported as - Papillary Carcinoma thyroid metastasizing to frontal bone.

3.3 Gross picture

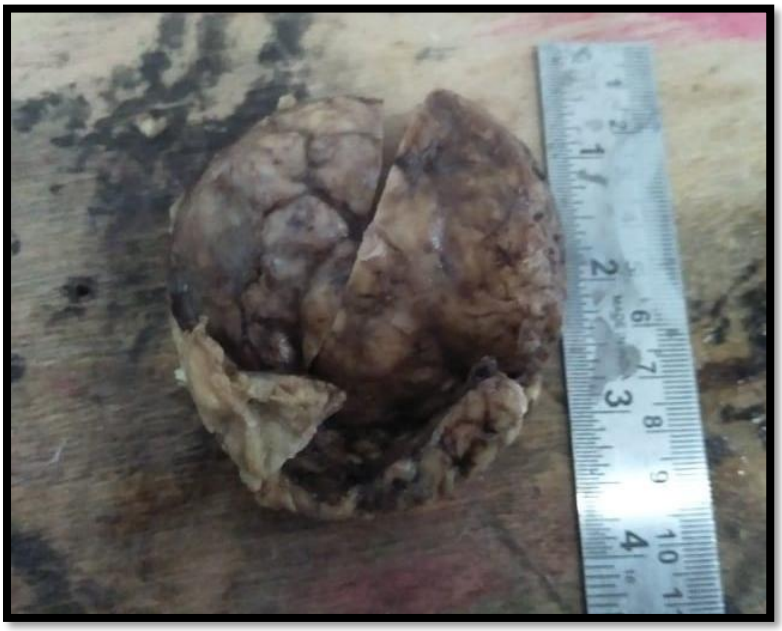

FIG. 4. **Gross specimen received - globular mass measuring 6 cm in diameter.**

3.4 Histopathology reveals

Section studied from multiple fragments of tissue revealed papillary projection with fibro vascular core, these papilla are lined by cuboidal cells having ground glass clearing (Orphans Annie eye appearance), pseudo inclusion, nuclear grooving with histological evidence of capsular invasion and bone invasion noted in section studied. Occasional psammoma bodies also seen.

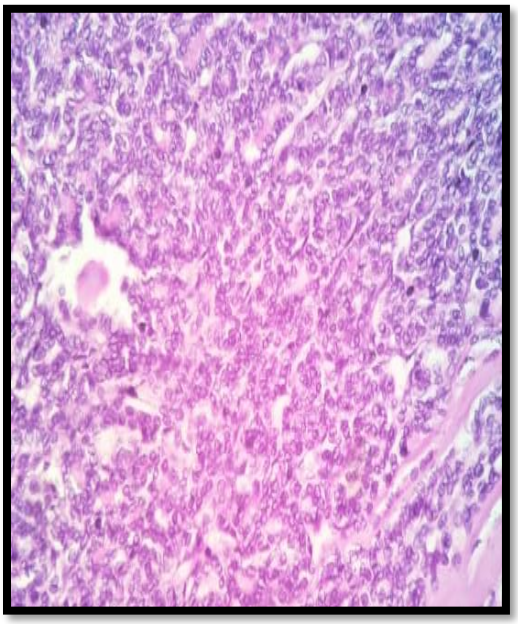

FIG. 7. **10× reveals cluster and sheets of malignant cells showing papillary and acini formation.**

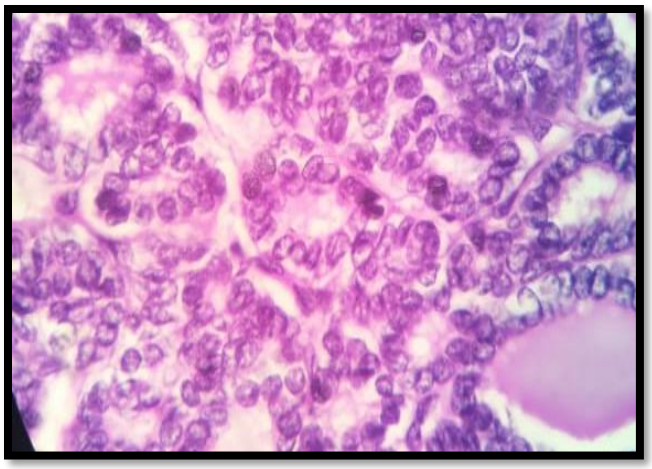

FIG. 8. **40× reveals nuclear features- clearing, pseudo inclusion, nuclear grooving suggestive of papillary carcinoma thyorid.**

Immuno histochemistry - showed nuclear immuno positivity for TTF1 (Thyroid transcription factor-1).

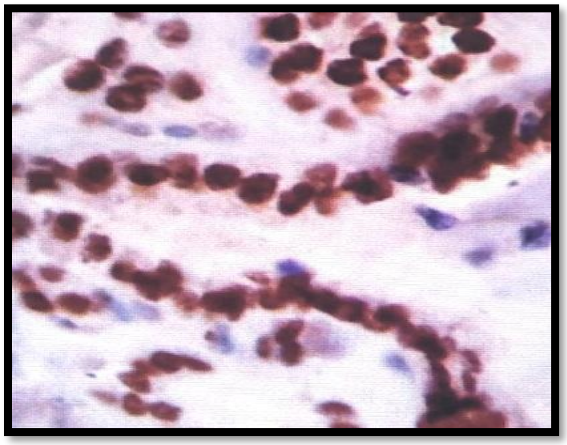

FIG. 9. **TTF-1 positivity.**

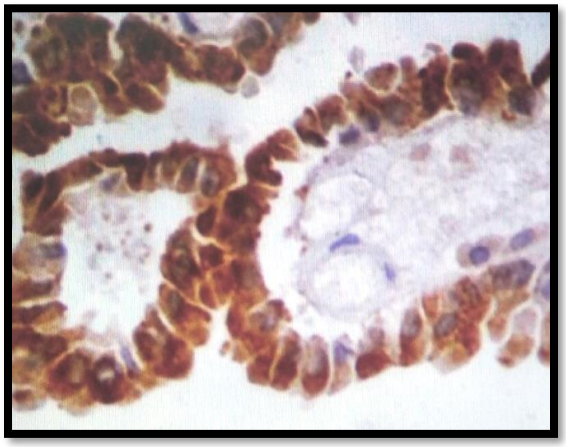

FIG. 10. **HBME-1 positivity.**

On the basis of histopathological report patient re- evaluated, thyroid profile was normal and radiologicaly diagnosed as colloid goiter in right. lobe of thyroid.

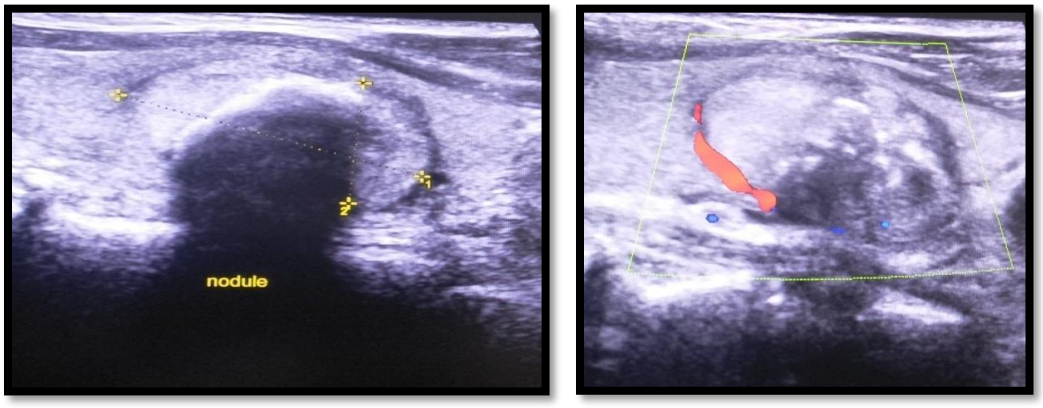

FIG. 11. **USG Reveals Colloid Goitre of Thyroid.**

3.5 Treatment plan

Patient referred to oncology department total thyroidectomy was done, Grossly- well defined thyroid nodule seen with peri nodular fibrosis seen. Finally diagnosed as- Follicular variant of papillary carcinoma thyroid (pT1N0M1). After total thyroidectomy patient was kept on radioiodine therapy and after three months follow up, patient responded well to treatment and was cured.

4. Discussion

Thyroid cancer is the most common endocrinal cancer in the world, with a rising global incidence over the last three decades [4]. Only a small proportion (2%-13%) of the patients afflicted with thyroid carcinoma develop bony metastasis; unfortunately, this decreases the survival rate by more than 60%.

The metastasis in skull develops in 2.5%-5.8% of the cases and mostly affects the base and the tissues that dwell within, such as the sella turcica, pituitary gland and vascular structures such as the cavernous and sphenoid sinuses. Metastatic tumors to skull are infrequent and arise mostly from the lung, breast, prostate, and renal cell carcinoma.

The incidence of skull metastasis from thyroid carcinoma is 1.8%-5.8%, predominantly from follicular carcinoma of thyroid [2]. Outcome of patients with skull metastasis due to PTC are poor with a mean survival time of 4.5 years, ranging from 5 months to 17 years in a series of 12 patients with thyroid carcinoma including both papillary and follicular subtypes [5].

Though PTC has an indolent course, skull metastasis appears to be the clinical parameter with poor outcome which requires prompt management decision. A close follow- up of the thyroidectomy patient should be done to detect these metastatic spots at an early phase because metastasectomy provide better survival in these patients.

In our study papillary carcinoma was indolent since ten years and patient had only complaint of swelling over forehead which obscured her vision. Later on, she was suddenly diagnosed as metastatic tumor of thyroid origin. And after removal of tumor and on radioiodine therapy tumor respond and patient become asymptomatic.

5. Conclusion

PTC with distant metastases is associated with poor prognosis. It is rarely associated with a metastatic spread to the skull and brain. Diagnosing such a rare clinical entity is a challenging task and is made possible via strong clinco pathological correlation. In our case Metastatic growth presents as an asymptomatic Primary brain tumor which is located in the occipital region, creating obstructed vision due to its large size.

Total thyroidectomy done with the removal of resectable metastatic lesions, RAI and external beam radiation at the sites of metastases provided in our case. Literature review illustrate that skull metastases should be considered in the clinical course of PTC because early diagnosis leads to prompt treatment which can improve patient survival.

6. Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

7. Financial Support and Sponsorship

Nil.

8. Conflicts of Interest

There are no conflicts of interest.

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