



SKULL METASTASES OF FOLLICULAR CARCINOMA THYROID: A RARE CASE REPORT

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INTRODUCTION

The thyroid gland, usually located below and anterior to the larynx, consists of two bulky lateral lobes connected by a relatively thin isthmus. The thyroid is divided by thin fibrous septae into lobules composed of about 20 to 40 evenly dispersed follicles, lined by a cuboidal to low columnar epithelium, and filled with PAS-positive thyroglobulin.^[1] The thyroid secretes hormones that control the heart rate, blood pressure, body temperature and basal metabolic rate.

There has been a dramatic increase in the number of people diagnosed with thyroid cancer in the past few decades.^[2] This may be attributable to the widespread use of imaging studies, such as ultrasounds, computed tomography, magnetic resonance imaging and positron emission tomography (PET) scans that incidentally detect thyroid nodule.^[3]

Thyroid cancer occurs more frequently in women than in men, at an approximate ratio of 3:1, more so in adults aged 45 to 54 years, with a mean age of 50 years at diagnosis.^[4]

Follicular thyroid carcinoma is the second most frequent malignancy of the thyroid gland after papillary carcinoma. It accounts for about 10% of thyroid malignancies, with a higher occurrence in women aged 40–60 years.^[5] They are usually slow growing tumours and known to disseminate hematogenously and metastasize in advanced cases. Distant metastases are seen in about 10–15% cases, with bone and lungs as preferred metastatic targets.^[6] FTC metastases to the skull are exceedingly rare and challenging.

From available data, around 2.5% to 5% of cases of thyroid cancers may spread to the skull.^[7]

We present a rare case report of follicular thyroid carcinoma metastasis to skull.

CASE REPORT

A 64 years old female from rural part of Jharkhand presented to the surgery out-patient department with complaints of swelling in the right side of head since two months. It was small initially but grew to a size of 13*10. There was no pain or any other distressing symptom. On examination, the swelling was soft and fluctuant with engorged veins on the surface and was fixed to underlying bone. There was no appreciable pulsation or cough impulse over the swelling. Further, a swelling measuring about 15*5 cm was noticed on her neck suggestive of thyroid enlargement.[Figure 1] The swelling moved on deglutition and was multinodular on morphology. There were no palpable regional lymph nodes. On taking a detailed history, she revealed that she was having this swelling for about 20 years but since she did not have any symptom associated with the swelling, she had not undergone any evaluation for the same and was not under any

medication. Also, she had not noticed any recent increase in the size. Apart from these, the patient had no symptoms suggestive of pressure on neck structures, no features of toxicity and no features of any swellings elsewhere in the body. All the other systems including the respiratory and central nervous systems were found to be normal.

Thyroid function test revealed normal values and euthyroid status. An ultrasound of the neck was done and the report was given as 'Multi-nodular goitre involving both lobes of the thyroid gland, with a hypo-echoic suspicious area of differentiated thyroid malignancy in the left lobe'.

An X-ray of the skull was done and it revealed a discrete osteolytic lesion in the frontal bone on the left side. CT scan revealed no dural defects or intracranial lesions.

A Fine Needle Aspiration Cytology (FNAC) of the thyroid swelling was done which showed a highly cellular smear of follicular epithelial cells in microfollicular pattern reported as Follicular neoplasm. [Figure 2,4] FNAC of the skull lesion showed similar pattern of cells and suggested a possibility of metastases from differentiated thyroid neoplasm.[figure3]. A cell block preparation was made using 2ml isopropyl alcohol and 2ml normal saline along with FNAC of aspirate and a pallet was obtained. Slide was prepared from the pallet and stained with hematoxylin and eosin. Highly cellular smear with follicular cells in micropapillary pattern was seen. [Figure 5] Chest X-ray and other routine investigations were all within normal limits. Based on these findings, the patient was diagnosed as follicular thyroid carcinoma with skull metastases.

DISCUSSION

Follicular carcinoma is the second most frequent malignancy of thyroid gland after papillary carcinoma among the various subtypes. It occurs in much older age group than papillary i.e. in the 40 to 60 years.^[8] and generally seen in elderly females, primarily having longstanding non-toxic multi-nodular goitre (50.2%), solitary thyroid nodule (44.2%) and rarely in patients with endemic goitre.^[9] Unlike papillary cancers which metastasizes mainly to lymph nodes, FTC metastasizes to lymph nodes in only 5% to 10% of patients at the time of diagnosis. Haematogenous spread is much more common in FTC. Lungs and bones are commonly involved sites by metastasis but the brain, skin, liver, adrenal gland and even mediastinum may also be involved.^[10]

They are slow growing tumours, probably induced by chronically elevated Thyroid-Stimulating Hormone (TSH) levels.

There are reported cases of metastases from follicular carcinoma to the kidneys and even the choroid of the eye.^[11] Among bones, skull is a rare site for metastasis.

The commonest mode of presentation of skull metastases from follicular cancer is as pulsatile skull swelling. Symptoms due to increased intracranial pressure, features of cranial nerve dysfunction or focal deficit maybe present rarely. These tumours are usually highly vascular, with evident osteolytic changes in the skull. The largest case series of skull metastases from all types of thyroid cancers consists of 12 cases reported by Nagamine et al.^[7] In this series, mean time from the diagnosis of thyroid tumour until discovery of skull metastasis was 23.3 years.

Histologically these lesions demonstrate features of well differentiated follicular adenocarcinoma. They can be distinguished from other adenocarcinoma metastasis by immunohistochemistry using Thyroid Transcription Factor-1(TTF-1) and Thyroglobulin (TG).^[12] Also these lesions are highly vascular on angiographic assessment^[13] and can cause significant morbidity and mortality during surgical resection. So it is recommended that resection of the metastatic lesion should only be performed in carefully selected cases because of the associated complications.^[14]

CONCLUSION

Though the incidence of papillary thyroid carcinoma is much higher, mortality is associated more with follicular carcinoma.^[15] The prognosis of follicular carcinoma commonly depends on the presence and extent of distant metastatic disease. In locally limited disease, 90% ten year survival can be expected, whereas with distant disease that value drops to below 50%. Thus metastasis from differentiated thyroid malignancy should always be suspected in patients who present with suspicious skull metastases.



Figure 1 Appearance of thyroid mass and skull swelling

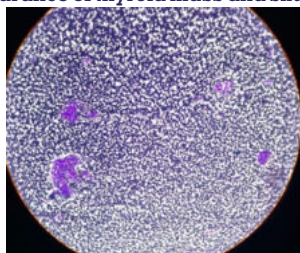


Figure 2. clusters of follicular epithelial cells (Thyroid: LG 10X)

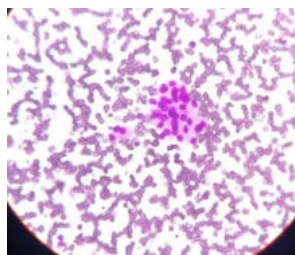


Figure 3. follicular epithelial cells from skull swelling (LG 40X)

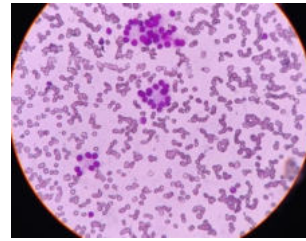


Figure 4.Follicular cells showing micro-follicular arrangement (LG 40X)

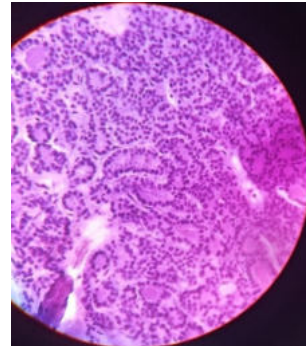


Figure 5. Cell Block preparation showing microfollicles (LG 40x)

REFERENCES

1. Robbins & Cotran; Pathologic Basis of Diseases: 9th Edition Chater 24: 1082
2. Smith LH, Danielsen B, Allen ME & Cress R 2003 Cancer associated with obstetric delivery: results of linkage with the California cancer registry. *American Journal of Obstetrics and Gynecology* **189** 1128–1135.
3. Tagle P, Villanueva P, Torrealba G & Huete I 2002 Intracranial metastasis or meningioma: an uncommon clinical diagnostic dilemma. *Surgical Neurology* **58** 241–245.
4. Ogawa Y, Sugawara T, Seki H & Sakuma T 2006 Thyroid follicular carcinoma metastasized to the lung, skull, and brain 12 years after initial treatment for thyroid gland-case report. *Neurologia Medico-Chirurgica* **46** 302–305.
5. D’Avanzo A, Treseler P, Ituarte PHG, Wong M, Streja L, Greenspan FS, et al. Follicular thyroid carcinoma: histology and prognosis. *Cancer*. 2004;100:1123–9.
6. McHenry CR, Phitayakorn R. Follicular adenoma and carcinoma of the thyroid gland. *Oncologist*. 2011;16:585–93.
7. Nagamine Y, Suzuki J, Katakura R, Yoshimoto T, Matoba N, Takaya K. Skull metastasis of thyroid carcinoma. Study of 12 cases. *J Neurosurg*. 1985;63:526–31.
8. Shah S, Muzaffar S, Soomro I, Hasan S. Morphological pattern and frequency of thyroid tumours. *J Pak Med Assoc*. 1999;49:131–3.
9. Rao RS, Parikh HK. Prognostic factors in well-differentiated carcinoma of thyroid. In: Shah DH, Samuel AM, Rao RS, eds. *Thyroid Cancer - An Indian Perspective*. 1st ed. Mumbai, India: Quest Publications; 1998: 443-450.
10. Schlumberger M, Tubiana M, De Vathaire F, Hill C, Gardet P, Travaglini JP, et al. Long term results of treatment of 283 patients with lung and bone metastases from differentiated thyroid carcinoma. *J Clin Endocrinol Metab*. 1986;63:960–7.
11. Guignier B, Naoun O, Subilia A, Schneegans O. Choroidal metastasis from follicular thyroid carcinoma: a rare case. *J Fr Ophthalmol*. 2011 May; 34(5):329.e1-5.
12. Sathiyamoorthy S, Maleki Z. Cytomorphologic overlap of differentiated thyroid carcinoma and lung adenocarcinoma and diagnostic value of TTF-1 and TGB on cytologic material. *Diagn Cytopathol*. 2014 Jan;42(1):5-10.
13. Akdemir I, Erol FS, Akpolat N, Ozveren MF, Akfirat M, Yahsi S. Skull metastasis from thyroid follicular carcinoma with difficult diagnosis of the primary lesion. *Neurol Med Chir (Tokyo)*. 2005;45:205-8.
14. Mydlarz WK, Wu J, Aygun N, Olivi A, Carey JP, Westra WH, et al. Management considerations for differentiated thyroid carcinoma presenting as a metastasis to the skull base. *Laryngoscope*. 2007
15. Grebe SK, Hay ID. Follicular thyroid cancer. *Endocrinol Metab Clin North Am*. 1995;24:761-801.