

CASE REPORT**Skull metastasis of follicular thyroid carcinoma: a rare case report**

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Abstract:

Follicular thyroid carcinoma is a malignant epithelial tumor arising in both eutopic thyroid gland and/or heterotopic thyroid tissue. Follicular cancer accounts for 5-15% of all thyroid cancers in iodine sufficient areas i.e. is the second commonest form of differentiated thyroid malignancy. It spreads via haematogenous routes. So it spreads to lungs and bones. In thyroid cancer only 2.5 % cases shows skull metastases. Here, presenting a 61 year old female with a swelling in the skull left frontotemporal region for 4 years duration with proptosis. She also had thyroid swelling of 20 years duration which is asymptomatic. Cytological confirmation was done to diagnose follicular carcinoma with skull bone metastasis. After total thyroidectomy external beam radiotherapy was given to skull metastases in view of threatened vision. Radioiodine therapy was given afterwards.

Keywords: follicular thyroid carcinoma, Metastasis, proptosis

Introduction:

Follicular carcinoma is the second most common thyroid malignancy. Generally very slow growing in nature. Distant spread may occur to bones, lungs, brain, skin and sometimes kidneys and adrenal glands. According to literature, the reported incidence of distant metastasis is between 10% and 25%, but it is very uncommon for the disease to present with distant metastasis at initial presentation itself ⁽¹⁾. From available data, around 2.5% to 5% of cases of thyroid cancers may spread to the skull ⁽²⁾. Skull bone metastasis is common in prostate, lung, breast carcinomas, but very rare for thyroid carcinoma. Metastasis in thyroid cancer occurs in long standing cases generally 15-20 years duration. Here we present a case who has presented with skull swelling along with long standing neck swelling.

Case report:

The patient, a 60 years old female presented to the out-patient department with complaints of swelling in the left side of head of 4 years duration. The patient complained that the swelling has gradually grown in size but not

causing pain or any other distressing symptom. There is significant proptosis of left eye is seen due to swelling. Also she complained of diminution of vision of left eye.



Figure 1: left frontotemporal skull metastasis with proptosis of left eye

On detailed history, she revealed that she was having a swelling in the neck for about 20 years. Since she did not have any symptom associated with the swelling, she did not undergo any evaluation for the same and was not under any medication for the same. Also, there was no history of any recent increase in the size of the neck swelling. 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. There were no other comorbidities associated with this.

On examination, the patient was found to have large, well circumscribed swelling in the left frontotemporal region of skull, of about 6.5 x 7.5 cm size and with smooth surface (Figure 1). The swelling was found to be hard,

immobile and fixed to underlying bone. There was no appreciable pulsations or cough impulse over the swelling.



Figure 2: Right neck swelling of thyroid origin

On examination of neck 5 x 6.5 cm size well rounded mass of right thyroid gland is seen, it was hard in consistency and with restricted mobility (Figure 2). Left thyroid was looking normal. There was no sign of any retrosternal extension. There were no palpable regional lymph nodes. The trachea was central. There were no features of carotid compression. All the other systems including the respiratory and central nervous systems were found to be normal.

The patient underwent thyroid function test which revealed normal values and euthyroid status. CT scan of brain showed heterogeneous mass arising from left temporal bone which was compressing and displacing left orbital contents with stretching of optic nerve (Figure 3). CT scan of neck revealed right lobe thyroid heterogeneous swelling with peripheral enhancement s/o thyroid malignancy (Figure 4). There were no detectable lymph nodes in

the neck. A Fine Needle Aspiration Cytology (FNAC) of the nodule showed diagnosis of Follicular neoplasm. FNAC of skull lesion suggested follicular carcinoma cells. CT thorax and other routine investigations were all within normal limits. Based on these findings, the patient was diagnosed as Follicular thyroid carcinoma with skull metastases and proptosis.

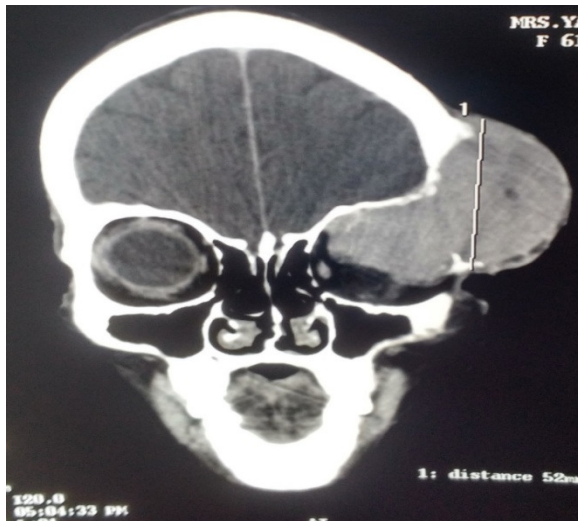


Figure 3: CT Scan of skull metastasis

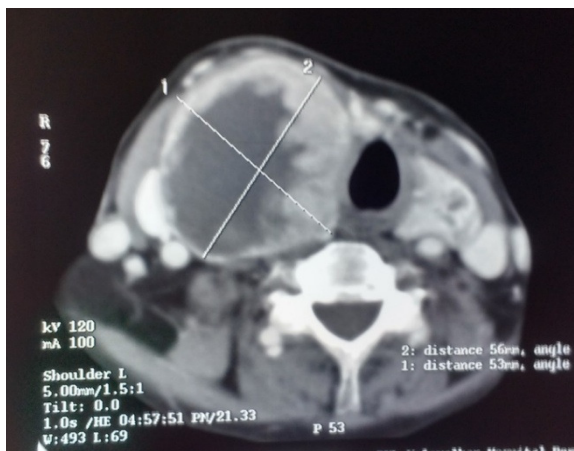


Figure 4: CT scan of neck showing right thyroid enlargement with heterogeneous appearance.

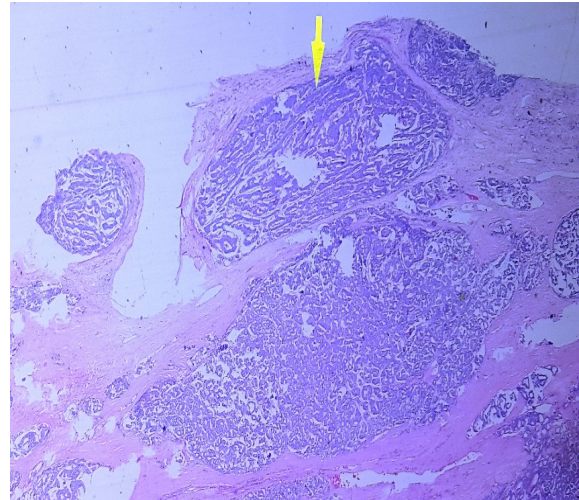


Figure 5: Section from cystic nodule of right thyroid lobe showing capsular invasion (arrow) and underneath tumor cells in repetitive follicular pattern (H&E, X 40).

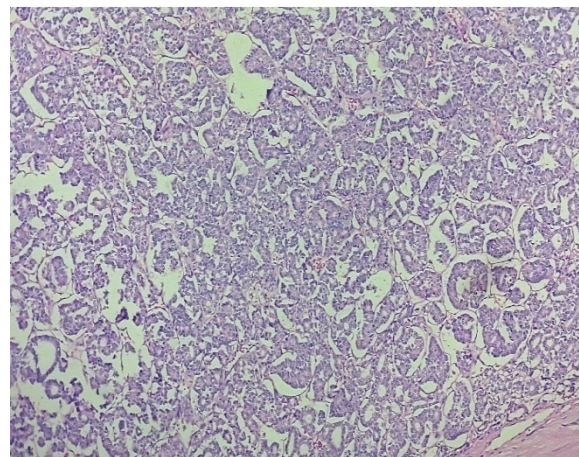


Figure 5: Section from cystic tumor of isthmus nodule showing tumor cells in repetitive follicular pattern (H&E, X 400).

After complete preoperative profile and ophthalmic checkup, patient was taken for total thyroidectomy. Intra-operatively the gland was found to have multiple nodules on right side with left side looking normal. Total thyroidectomy with bilateral level II to IV and

central compartment neck dissection was done. Post-operative histopathology confirmed diagnosis of follicular carcinoma (figure 5, 6) Post-operative period was uneventful. Postoperatively patient received 30Gy (10#) external beam radiotherapy for skull metastasis. After completion of EBRT patient was referred for radioactive iodine therapy.

Discussion:

Follicular thyroid cancer (FTC) is second most common thyroid cancer around 10% of all thyroid cancers. Generally bone metastasis of thyroid tumors are multiple with ribs, sternum and vertebrae as common sites⁽³⁾. Skull is a rare site of metastasis with occipital region as commonest one. Follicular thyroid carcinoma occurs in much older age group than papillary i.e. in the 40 to 60 years of age group⁽⁴⁾. This carcinoma is generally seen in elderly females, with longstanding non-toxic multi-nodular goiter (50.2%), solitary thyroid nodule (44.2%) and rarely in patients with endemic goiter.⁽⁵⁾ This type of neoplasm is probably induced by chronically elevated Thyroid-Stimulating Hormone (TSH) levels. Follicular cancers are slow growing tumors. Haematogenous spread is however much more common in FTC with almost 20% of patients having distant haematogenous metastasis at the time of presentation. Although lungs and bones are commonly involved sites by metastasis, the brain, skin, liver, adrenal gland and even mediastinum may also be involved by thyroid cancers⁽⁶⁾. There are reported cases of metastases from follicular carcinoma to the kidneys and even the choroid of the eye⁽⁷⁾. Among bones, skull is a rare site for metastasis.

The largest case series of skull metastases from all types of thyroid cancers consists of 12

cases reported by Nagamine et al⁽²⁾. In this series, mean time from the diagnosis of thyroid tumor until discovery of skull metastasis was 23.3 years. Skull metastases from thyroid cancers are usually soft, hemispheric tumors resting on the skull. These tumors are usually highly vascular, with evident osteolytic changes in the skull. The commonest mode of presentation of skull metastases from follicular cancer is as pulsatile skull swellings. Very rarely, there can be features of cranial nerve dysfunction, focal brain symptoms or symptoms due to increased intracranial pressure. Rarely do they cause proptosis with loss of vision as in our case. These lesions are osteolytic on skull X-ray and CT scan and highly vascular on angiographic assessment⁽⁸⁾.

One of the significant problems in skull metastases is the bone defect which may require bone resection and cranioplasty. Most of these tumors are highly vascular, and there is potential for significant morbidity and mortality associated with surgical resection. As per general recommendations, histopathologic tissue diagnosis should always be attempted, followed by total thyroidectomy, radioiodine ablation, or external beam radiation, and chronic thyroid stimulating hormone suppression. However, experts recommend that surgical resection of the metastatic lesion should only be performed in carefully selected cases because of the associated morbidity⁽⁹⁾.

We have managed proptosis in this case with EBRT in view of threatened vision due to involvement of optic nerve. EBRT can give good palliation in cases where metastases is diffuse, inoperable and involving important structure like optic nerve. Surgical debulking is also an option in case of sudden diminution

of vision. The effectiveness of Iodine-131 (I-131) in bone metastases treatment is suboptimal. Even in patients who have bone metastases that avidly take up I-131, only a very small proportion is able to achieve complete response following I-131 therapy. Bone metastases associated with radiographic changes are particularly known not to respond well to I-131 therapy.⁽¹⁰⁾

The prognosis of FTC is not as extremely favorable as papillary, but much better than anaplastic thyroid cancer or other cancers in the body. Prognosis 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%. In summary, metastasis from differentiated thyroid malignancy should always be suspected in patients who present with suspicious skull metastases. After confirmation such patients should undergo thyroidectomy and radio-iodine ablation or external irradiation for the metastases as they can have a good prognosis.

Conclusion:

It is rare presentation of follicular carcinoma of thyroid showing skull metastasis and specifically in frontotemporal region causing proptosis. So in differential diagnosis of skull metastasis one must keep in mind about follicular thyroid carcinoma.

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