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A RARE PRESENTATION OF CALVARIAL METASTASIS FROM FOLLICULAR CARCINOMA THYROID -A CASE REPORT

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ABSTRACT: Bone metastases are common but serious complication of aggressive thyroid carcinoma, but calvarial metastasis is relatively uncommon complication of the primary tumor of thyroid gland. We are presenting an unusual case report of large calvarial metastasis which had both intracranial and extra cranial components of a previously diagnosed and operated case of follicular carcinoma of thyroid.

KEY WORDS: Calvarial metastasis, primary follicular carcinoma of thyroid, skeletal metastasis in thyroid carcinoma.

INTRODUCTION: Metastases to the skeletal system from thyroid carcinoma are a well-known event, constituting the second most common systemic site of involvement after lungs. The poor prognosis associated with bone metastases of differentiated thyroid cancer might partly be due to the fact that they are rarely detected at an early stage. Carcinoma of the thyroid gland is one of the possibly curable cancers. At the time of initial diagnosis, 1%–3% of patients with thyroid cancer may have distant metastases, whereas another 7%–23% will develop distant metastases during the disease course^{2, 12, 16}. The distant metastases, especially those involving bone, increase mortality rate, compromise quality of life and shorten patient survival.

After lung, bone is the most common site of systemic metastasis from thyroid carcinoma^{1,2}, the overall reported incidence ranging from 1%³ to more than 40%⁴. This incidence varies according to the primary tumour type, with follicular carcinoma showing a much higher frequency than the papillary or anaplastic subtypes in most reported series^{1, 2, 5-8}. Approximately 90% of non-medullary thyroid malignancies are well differentiated and are classified as papillary or follicular. Patients with differentiated thyroid carcinoma (DTC) have a high 10-year survival rate (80%–95%), except in the presence of metastatic disease (40% 10-year survival). Incidence of bone metastases is Vertebrae (54%), Pelvis (50%), Ribs (31%), Femur (21%), Skull (13%) and Humérus (11%).

Among the different histologic subtypes, follicular carcinoma is most likely to show bone metastases, with reported incidences ranging from 7% to approximately 28%. The poor prognosis associated with bone metastases of differentiated thyroid cancer might partly be due to the fact that they are rarely detected at an early stage. The influence of the microscopic tumor type and tumor differentiation on survival after bone metastasis primarily appears to be due to the much worse prognosis among anaplastic and medullary carcinomas. Age at diagnosis of bone metastases does not influence survivals.

CASE REPORT: A 44 year old woman with past history of total thyroidectomy for follicular thyroid carcinoma, proved postoperatively, presented with large gradually increasing swelling in the occipital region since 6 to 7 years with no significant associated pain.

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The patient was subjected to radiograph of skull AP & lateral views, CT Brain, CT angiography and MRI Brain. Radiograph skull showing large osteolytic lesion causing near total destruction of the bone and associated with large disproportionate soft tissue component. CT brain plain and contrast showed evidence of large heterogenous predominantly soft tissue density lesion with destruction of the underlying occipital bone and a large extradural component causing compression of occipital and parietal lobes. The lesion is showing heterogenous enhancement on contrast administration with multiple focal non-enhancing hypodense areas, suggestive of cystic / necrotic areas. MRI brain showed large lobulated heterointense lesion predominantly iso to hyper intense on FLAIR, T1WI & T2WI in the occipital region. The lesion is causing destruction of underlying bone & extending intracranially into the extradural space, causing mass effect in the form of compression of bilateral occipital, parietal lobes with no significant adjacent cerebral edema. On contrast administration the lesion showed heterogeneous enhancement. CT angiogram showed the lesion is intensely vascular. The diagnosis is of a highly vascular predominantly soft tissue density lesion causing destruction of the underlying occipital bone and a large extra dural component. In view of a known primary in the thyroid with post total thyroidectomy possibility of a metastatic lesion was considered. Surgery was done and the specimen sent for histopathology, it revealed evidence of follicular pattern cells with nuclear cluster with features of tumor emboli suggestive of follicular carcinoma thyroid deposit.

DISCUSSION: Metastases to the skeletal system from thyroid carcinoma are a well-known event, constituting the second most common systemic site of involvement after lungs ^{1, 2, 9}. The overall reported incidence of bone metastasis from thyroid carcinoma has ranged from less than 1% to more than 40% ^{2-4, 8, 9-11}. Among the different histologic subtypes, follicular carcinoma is most likely to show bone metastases, with reported incidences ranging from 7% to approximately 28% ^{8, 9, 12}. Most studies of thyroid carcinomas that result in bone metastases show a preponderance of follicular over papillary carcinoma (46%–93% versus 7%–40%) or other types of thyroid cancers ^{8, 11, 13, 14}. However, the relatively recent studies by Wood et al ¹⁵, Ruegamer et al ¹⁶, and Mizukami et al ¹⁷ report a much higher relative incidence of papillary carcinoma among their cases with bone metastases (41%–77%).

Calvarial metastases are usually asymptomatic and discovered incidentally on radiographic studies. The imaging techniques to detect bone metastatic lesions include plain radiography, computed tomography (CT), magnetic resonance imaging (MRI), isotope bone scans, positron emission tomography (PET), radioiodine uptake, and others. The management of primary thyroid cancer is multidisciplinary, including surgeons, endocrinologists, nuclear medicine physicians, and radiotherapists. The 5-year survival rates for patients with bone metastases ranged from 53% to 84% in previous reports ^{2, 18, 19}. The most common presenting symptom is a visible, localized swelling of the skull produced by a growing tumor that erodes the outer table. Tumors can also expand through inner skull tables and apply direct pressure on adjacent brain parenchyma. Rarely, they may be associated with either subdural or epidural hematomas. Focal sensorimotor deficits and seizures occasionally result from progressive inward growth of a calvarial metastatic lesion or associated subdural hematoma.

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CONCLUSION: The presence of distant metastases is considered one of the most important indicators of unfavorable prognosis in differentiated thyroid carcinomas. The poor prognosis associated with bone metastases of differentiated thyroid cancer might partly be due to the fact that they are rarely detected at an early stage. In conclusion, thyroid carcinoma can present with bone metastases in its early stage. Early detection and management should help disease control and improve patient's quality of life. A high index of suspicion is needed to detect these early bone metastases at the initial visit, allowing prompt and thorough follow-up during clinical practice.

IMAGES:

Image 1: Plain radiograph of skull lateral view showing a large well-defined homogenous opacity noted in the posterior aspect of skull with near total destruction of the underlying occipito-parietal bones.

Image 2 and 3: CT brain plain axial sections parenchymal and bone window show relatively well defined heterogenous predominantly hyperdense soft tissue density lesion with multiple ill-defined cystic spaces noted in the posterior aspect of the occipito-parietal region with destruction of the underlying bone and with intracranial extension.

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Image 4: CT brain post contrast coronal image shows intense heterogeneous enhancement of the lesion with compression of the occipito-parietal lobes.

Image 5: MRI brain T2WI axial image shows the lesion is of a large heterointense, predominantly hyperintense to the surrounding cortex noted in posterior aspect of the occipito-parietal region with intracranial extension with ill-defined hyperintense cystic spaces.

Image 6: MRI brain T1WI axial image shows the lesion is isointense to the adjacent cortex compressing the occipito-parietal lobes and limited by dura(↑).

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Image 7: CT cerebral angiography 3D VRT reconstructed image shows a highly vascular lesion with prominent vascular channels noted within the lesion and the major vascular supply from external carotid artery.

Image 8: Histopathological slide shows revealed evidence of follicular pattern cells with nuclear cluster with features of tumor emboli suggestive of follicular carcinoma thyroid deposit.

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