CRANIAL AND VERTEBRAL METASTASIS: PRESENTING SYMPTOM OF FOLLICULAR THYROID CARCINOMA

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ABSTRACT
Follicular thyroid carcinoma usually presents as an asymptomatic, painless neck lump and can cause hoarseness, difficulty swallowing/breathing, neck fullness, and persistent cough due to compression. But many cases are found incidentally during imaging or metastatic deposits can be the presenting symptom. The common sites for these metastases are the lungs and bones, trachea, skin, liver and some other body parts. Metastasis to bone is most likely to occur in scapula, sternum and long bones. Metastasis to skull is very uncommon in follicular carcinoma thyroid and predominantly involve vault in which most notably the occipital bone, parietal and frontal bones. Skull and vertebral metastasis as a rare presenting symptom of follicular thyroid carcinoma. Here we report a case of follicular thyroid carcinoma in a 60-year-old female who came with complaints of pain in neck radiating to left upper limb for three years, slow growing swelling over occipital region and midline upper back and backache for 2 years.

Keywords: Thyroid, Carcinoma, Skull, Metastasis.
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Introduction:
Follicular thyroid carcinoma is a significant thyroid malignancy, second only to papillary thyroid carcinoma in frequency. It accounts for roughly 10-15% of all primary thyroid cancers [1-2]. This cancer tends to appear later in life and carries a higher mortality rate than papillary carcinoma. One of the challenging aspects of follicular thyroid carcinoma is that it can sometimes go undiagnosed until it has already metastasized. This cancer spreads commonly through the bloodstream. The metastasis occurs most commonly to the lungs and bones. It can also metastasize to the trachea, skin, liver and some other body parts [3]. Metastasis to bone is most likely to occur in scapula, sternum and long bones. Unlike the high incidence of skull metastasis seen in prostate, breast and lung carcinomas, it is quite rare for follicular thyroid carcinomas to present this way, occurring only in 2.5% – 5.8% of cases [4]. Metastasis to skull and vertebrae as a presenting symptom is extremely rare for follicular thyroid carcinoma. Here we present a case of 60-year-old female of follicular thyroid carcinoma who presented with swelling over occipital bone region and midline upper back swelling.

Case Report:
A 60-year-old female came to a surgical outpatient unit with complaints of pain in neck radiating to left upper limb since three years, slow growing swelling over occipital region and midline upper back and backache for 2 years There was no significant history of illness in the past. On physical examination, swelling measured 2.8 x 7.1 x 5.4 cm in the temporo-occipital region [Figure 1a]. Back swelling measures 1 x 0.8 x 0.5 cm in size. Routine haematology parameters were within normal range except haemoglobin which was 9.2 gm%. Computed Tomography (CT) scan of the brain revealed heterogenous mass lesion involving diploic space at right parietooccipital region with erosive thinning of inner table and outer table of skull bones at right temporo-occipital region [Figure 1b]. It was seen effacing the duramater. No obvious intracranial extension was seen. Few necrotic areas and multiple bony fragments were seen**.** Features were suggestive of bony metastasis. The ventricles, cortical sulci, sylvian fissures and basal cisterns appear prominent, suggestive of age-related cortical atrophy. Magnetic Resonance Imaging (MRI) brain revealed fairly well-defined lesion involving the bone and diploic space of right temporo-occipital region [Figure 1c].

It is seen extending and effacing dura, no obvious intracranial extension seen. It appeared heterogeneously hyperintense on T2WI/ FLAIR images, it was T1 isointense showing no significant diffusion restriction and shows no blooming on GRE. No extension to skin subcutaneous tissue noted. Magnetic Resonance Imaging (MRI) whole spine screening revealed fairly well-defined lobulated mass lesion noted arising from first rib to T1 vertebra [Figure 1d] involving the body, lamina propria and the spinous process (involving predominantly left sided elements) with paravertebral component on the left as it is seen extending through the left neural foramina. Paravertebral component measured approximately 5 x 5 cm, appeared T2 hypointense with few T2 hyperintense? cystic/ necrotic component. The vertebral body shows altered heterogeneously hypointense signal on T2WI (relative to another vertebra) with retropulsion of posterior portion causing spinal canal narrowing.

Paraspinal mass biopsy was received for histopathological examination. Tissue was fixed in 10% formalin and processed with paraffin wax. 3 to 4 thick micron sections were cut and stained with haematoxylin and eosin (H & E). Microscopy showed connective tissue infiltrated by tumour tissue comprised of small thyroid follicles, few of which were filled with colloid [Figure 2a]. Follicles were lined by cuboidal epithelium and showed round hyperchromatic nuclei. Diagnosis of metastasis of follicular carcinoma was made. Subsequent thyroid function test revealed, patient was euthyroid.

Subsequent ultrasonography of neck revealed well defined hyperechoic lesion of approximate size 10 x 08 x 06 mm showing peripheral calcification. The lesion showed internal vascularity on colour doppler, suggestive of TIRADS V lesion.

USG guided Fine Needle Aspiration Cytology (FNAC) from right lobe of thyroid was done. Microscopy revealed haemorrhagic background and numerous clusters of thyroid follicular cells. Few clusters show nuclear crowding and enlargement. Many microfollicles and scattered thyroid follicular cells were seen [Figure 2b]. Few smears showed moderate amount of thick colloid. Features were suggestive of Follicular Neoplasm, Bethesda category IV.

Subsequent specimen of total thyroidectomy was received for histopathology examination which revealed encapsulated grey tumour mass in right thyroid lobe measuring 3.7 x 2.7 x 2.6 cm [Figure 2c]. Microscopy showed fibrous capsule and thyroid follicles of different sizes, some of which were filled with colloid. There were no papilla or nuclear features of papillary thyroid carcinoma. Capsular and vascular invasion was seen [Figure 2d]. A diagnosis of follicular thyroid carcinoma of right lobe. pTNM classification (AJCC 8th edition) – pT2 pN not assigned pM1 stage was given.

Discussion:

FTC many times presents as an asymptomatic, painless neck lump and can cause hoarseness, difficulty swallowing/breathing, neck pain/fullness, and persistent cough due to compression. But many cases are found incidentally during imaging or metastatic deposits can be the presenting symptom. Follicular thyroid carcinoma is frequently identified during radiological imaging, though it may also present initially through symptom, caused by metastatic lesion. The prevalence of follicular thyroid carcinoma has declined, a trend largely attributed to global iodine fortification and more precise diagnostic criteria. Epidemiologically, the disease predominantly affects women between 40 & 60 years of age [5]. Unlike other malignancies of thyroid , follicular thyroid carcinoma spreads mainly through bloodstream. Secondary tumors occur most commonly in lungs and bones, with less frequent involvement of brain, liver and skin [6]. Within the skeletal system, metastasis most commonly occurs to vertebral column followed by the pelvis, cranium and long bones [7]. During post treatment surveillance, distant metastasis emerges in 2.2% to 23% of cases [8]. Consequently, the prognosis is significantly compromised by metastatic disease; patient with bone involvement face a 10 year survival rate of only 3% to 21% [9].

Although cranial metastasis in Follicular Thyroid Carcinoma (FTC) is an infrequent clinical entity. Large-scale cohorts from Korea and China have reported prevalence rates of 0.32% and 0.19%, respectively [10]. Key prognostic determinants for metastatic dissemination include female sex, age exceeding 45 years, tumor differentiation grade, and follicular histology [10].

Cranial lesions are predominantly situated on the vault—most notably the occipital bone, followed by the parietal and frontal bones in equal distribution [10]. In contrast, involvement of the spheno-ethmoidal sinuses, pituitary fossa, cerebellopontine angle, or parapharyngeal region is infrequently reported[10].

. In particular, solitary epidural metastases frequently mimic meningiomas, as both entities present as slightly hyperdense masses on CT imaging. However, FTC metastases are characteristically distinguished by osteolytic destruction of the calvarium and extension into the subcutaneous soft tissues [11,12,13].

Conclusion:

This case echoes previous findings regarding the difficulty of accurately diagnosing follicular thyroid carcinoma (FTC). When facing follicular thyroid carcinoma (FTC) with distant metastasis, the priority must be on thorough pre-surgical workups and a holistic view of the patient's health. Bringing together a team of specialists to build a treatment

plan specific to that patient is the best way forward. Ultimately, this level of personalized care is what reduces post-surgery risks and helps patients live longer, better lives.

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Legends to figures: Figure 1: (a) Swelling in temporo-occipital region, (b) CT brain: heterogenous mass lesion involving diploic space at right parietooccipital region [blue arrow], (c) MRI brain: lesion involving the bone and diploic space of right temporo-occipital region [blue arrow], (d) MRI spine: lobulated mass lesion noted arising from first rib to T1 vertebra [blue arrow]. Figure 2: (a) connective tissue infiltrated by tumour tissue comprised of small thyroid follicles [H & E stain 100x], (b) numerous clusters of thyroid follicular cells [H & E stain 100x], (c) Gross- encapsulated grey tumour mass in right thyroid lobe, (d) capsular and vascular invasion [H & E stain 100x].