Case Report **OPEN ACCESS**

Thyroid carcinoma presenting as a dural metastasis mimicking a meningioma: A case report

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Abstract

Context: Follicular thyroid cancer rarely manifests itself as a distant metastatic lesion. **Case Report:** We report a case of a 41-year old man presented with a solid mass located in the left temporo-occipital region. The 3D computed tomography showed a large solid mass with high vascularity, skull erosion and supra-infratentorial epidural mass effect. After magnetic resonance imaging (MRI) a suspect diagnosis of meningioma was made. The patient underwent surgery where a soft mass with transverse sinus invasion was encountered; the tumour was successfully resected employing microsurgical techniques. Histological examination revealed a thyroid follicular neoplasm with positive staining for follicular carcinoma in immunohistochemical analysis. Postoperatively levels of thyroid hormones were normal. Treatment was planned for the thyroid gland, patient receiving 6 courses of chemotherapy including paclitaxel. **Conclusions:** The present case emphasizes that although they are uncommon, dural metastasis can be mistaken for meningiomas. The definitive diagnosis of a meningioma should be established only after the histopathological analysis. Thyroid follicular carcinoma should be included in the differential diagnosis in cases of extrinsic tumoral lesions.

Keywords: Metastasis, thyroid follicular carcinoma, meningioma.

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Introduction

Skull metastasis of extra cranial origin is rare. The most common forms are pulmonary, breast and prostate carcinomas [1]. Metastasis in the skull associated with carcinoma of the thyroid accounts for only 2.5–5.8% of cases, but the initial presentation with distant metastasis is uncommon [2]. Isolated forms have radiological features that strongly suggest a primary tumor, and furthermore, their macroscopic appearance during surgery may even be taken for a meningioma [3].

In this paper, we described a patient who initially presented a tumor that invaded the scalp, dura mater, transverse sinus, supra and infratentorial space, mimicking a malignant meningioma. The lesion resulted in a metastatic location of a thyroid follicular carcinoma.

Case Report

A 41-year-old man was referred to our institute with a 1-year history of persistent headache and a mass in the left temporo-occipital region, the mass had developed in the last year and rapidly grown within 6 months.

The physical examination revealed a fixed, five centimeters solid mass. The neurologic examination on admission showed no abnormalties. The computed Angiotomography showed a large extrinsic solid lesion with epidural mass effect and contrast enhancement causing bone destruction. MRI showed a supra-infratentorial tumour location with invasion of the scalp and left transverse dural sinus (Fig. 1).

Endovascular embolization was not possible and the patient underwent surgery. Intraoperatively, the tumour was found immediately in the scalp appearing as a soft, reddish, highly vascularizated mass with dural invasion. The inferior and posterior borders of the tumour encased the left transverse sinus; the tumour was successfully dissected employing microsurgical techniques. Finally, a

complete resection of the tumour was achieved. Postoperatively, the patient was extubated and observed in the surgical intensive care unit. He remained free from neurologic deficits. Histological examination revealed a thyroid differentiated neoplasm with positive staining for thyroglobulin and follicular carcinoma in immunohistochemical analysis (Fig. 2).

Postoperatively levels of thyroid hormones were normal. Radionuclide imaging with Tc^{99} demonstrated a thyroid mass. Radiological neck, chest and abdominal examination revealed no other metastatic localisations. The patient received 6 courses of treatment with Paclitaxel.

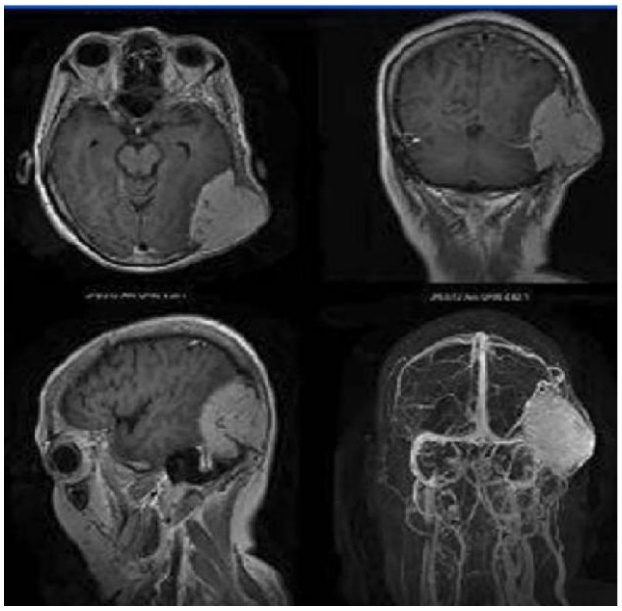

Fig. 1 MRI showing an extrinsic mass with scalp, bone and dura involvement. The mass causes bone erosion and has supra-infratentorial, and left transverse sinus extension.

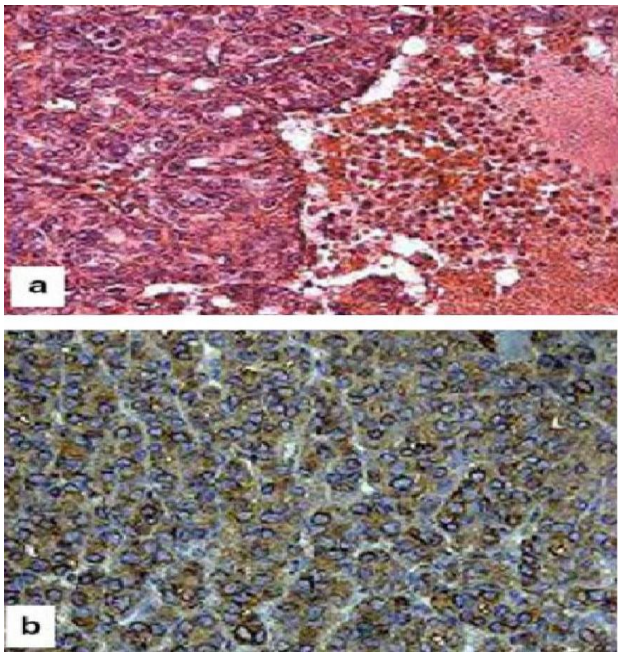

Fig. 2 a Tissue removed from the tumour zone showing cubic cells resembling thyroid follicular cells (hemotoxylin and eosin, original magnification 9400). **b** Immunohistochemistry showing positive staining for tyroglobulin. (Original magnification 9400).

Discussion

The incidence of thyroid carcinoma is about 1 per 25,000 populations, accounts for approximately 1% of all thyroid tumours. Follicular carcinoma accounts for 10–15% of clinically evident thyroid malignancies. Intracranial metastasis occurs about 1% of these cases [4, 5]. The mean age of presentation in a case series of 12 patients reported was 60 years and a female preponderance was seen [6]. Only one paediatric case has been described in the literature [7]. These statistics indicate the rarity of intracranial metastasis of thyroid follicular carcinoma. The method of spread of thyroid carcinoma is likelihood via the haematogenous route. Batson demonstrated a vertebral venous plexus which consisted of a valveless vascular bed within the spinal canal and extended from the skull to the pelvis [8]. Batson and Eckenhoff showed that there were multiple anastomosis and free connections between this venous plexus and the dural sinuses [9]. More recently arterial spread has also been suggested because of the association with secondary cutaneous locations in the territory of ipsilateral external carotid artery [10]. This is probably the physiopathology of the metastasis in our case. Patients usually have a long clinical course before the diagnosis of skull lesion, and the principal clinical features are a palpable scalp tumour, disturbance of consciousness, hemiparesis, headache, cranial nerve dysfunction and exophthalmos have all been reported [6, 11]. In our case, the period until diagnosis of the definite metastatic focus was 1 year. Eighty percent of patients with thyroid follicular carcinoma are seen initially with a solitary thyroid nodule [12]. Nevertheless, there are very few reports regarding the initial presentation of patients with distant metastasis leading to diagnosis of follicular carcinoma [13–20]. Emerick et al. reported two patients with distant metastasis at presentation [12]. Sevinc et al. reported a rare initial manifestation of a giant mass on the right scapula of a female patient [11].

The diagnosis in our case was difficult, because based on neuroimaging findings the most likely diagnosis was malignant meningioma. Dural metastasis of follicular carcinoma interpreted as meningioma has occasionally been reported [3, 21]. Anatomically, skull metastatic lesions are most frequently located over the occipital region, isolated papers report sellar region, posterior fossa, skull base [14–16]. Skull metastatic lesions were found to be osteolytic on CT scan, and highly vascular on angiographic assessment [6], the same as occurred in our case. The differential diagnosis of sarcoma and metastasis should always be considered when a lytic skull lesion with irregular edges and absence of peripheral sclerosis is identified, even in the young patient [7, 22]. The primary focus of thyroid metastasis, which causes large bone defects, is difficult to define [1, 23], metastatic tumours with unidentified primary tumour histology have been reported in patients with normal thyroid glands [13].

The best treatment for skull metastasis remain to be determined, but the current literature supports the excision of the lesion of the skull, removal of the thyroid tissue and maintenance TSH-suppression. Radiotherapy and iodine^{131} internal radiation are other treatment options recommended for highly vascularised metastatic skull tumours [24]. Only 17% of metastatic lesions to the brain take up iodine^{131}, so the effect of radioactive ablation on brain metastasis is very restricted [25]. Intracranial metastasis have been treated by external beam radiation or radioactive ablation using iodine^{131} but the effect was very limited [26]. Complete resection of brain secondary sites remains the optimal treatment. The primary tumor is treated with radioactive iodine^{131}[5]. In the absence of established treatment protocols to follow up in patients with intracranial metastasis from follicular carcinoma, the practitioner is especially challenged when faced with this disease.

Conclusion

This is a rare case of follicular thyroid carcinoma metastasized to the bone with supra-infratentorial extension. Metastatic follicular carcinoma should be kept in mind in differential diagnosis of cranial masses.

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El Mehdi Tazi and Ismail Essadi analyzed, interpreted the patient data regarding its oncological features, and has been involved in drafting the manuscript. Hassan Errihani has given final approval of the version to be published. All authors read and approved the final manuscript.

The author(s) declare that they have no competing interests.

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