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Case Report

Metastatic thyroid carcinoma presented as a large craniofacial mass: Case report and CT findings

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ABSTRACT

Cranial metastases are uncommon locations of thyroid papillary carcinoma. They significantly reduce patients' survival, especially in a context of late management. We report the case of a 46-year-old woman who presented an anterior cervical swelling, then a progressive large craniofacial mass for more than 5 years without any treatment. The imaging performed showed a large craniofacial tissue mass with frontotemporal and right orbital bone destruction extended to the face sinuses and the underlying extradural space without brain involvement; the second thyroid tumor right site had similar imaging characteristics to the cranial mass. The diagnosis of papillary carcinoma with craniofacial metastasis was retained after cranial biopsy and thyroid cytology. At this stage, a cranial surgery has not been proposed but a palliative hormonal treatment. The patient died 2 weeks after diagnosis. This case illustrates the relevant role of imaging in the assessment of thyroid tumors and the value of early management for improving patients' survival.

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Introduction

Distant metastases of thyroid cancer are uncommon and occur in 3% to 20% of patients [1,2]. They preferentially affect

lungs and bones. In the literature, the incidence of cranial localization is rare. These metastases result from a long-term clinical course with prognostic factors such as: female sex, age over 45 years, differentiation degree, and follicular histologic variety [3,4]. Also, it may be a diagnosis delay in a context

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Fig. 1 – 3D reconstruction showing the craniofacial mass. Notice the important exophthalmia

of health care inaccessibility leading to an aggressive form with extension to orbitofacial bone structures and extradural space.

Clinical case and imaging results

It was a 46-year-old woman who had anterior cervical swelling, then a right craniofacial mass (Fig. 1) with a slow progression of more than 5 years, with no exploration. Progressive left-side hemiparesis, recurrent headaches, and a significant drop in right-side visual acuity motivated a consultation. Computed tomography showed a large right craniofacial osteolytic tissue mass with osteolysis of frontal bone, orbit, zygoma, temporal bone, nose bone, sphenoid bone, and process pterygoid (Fig. 2). The tissue mass was heterogeneous with necrotic areas and irregular contours. After injection of contrast product, an intense and heterogeneous enhancement of lesions was objectified. This tumor measured 151 mm in diameter. It invaded the right extradural frontotemporal space, and the right frontal crossing the median line. It had a mass effect on medial structures without cerebral involvement (Figs. 3A and B). There was also an extension to the right frontal and sphenoid sinuses and ethmoid cells (Fig. 3B). The right orbit was invaded with optic

nerve involvement leading to Grade 3 exophthalmos (Fig. 3C). There was no damage of the cerebral parenchyma. In the cervical stage, a tumor of the right thyroid lobe with similar characteristics to those of the craniofacial tumor was objectified, with calcifications and an intense and heterogeneous enhancement after injection of contrast product (Fig. 3D and E). Thyroid Papillary carcinoma with craniofacial metastases was diagnosed after cranial biopsy and thyroid cytopuncture. Palliative treatment with radioactive iodine was proposed. Unfortunately, the patient died 2 weeks after diagnosis.

Discussion

Thyroid cancer is the most common endocrine cancer in the world with a 5-year survival rate, which is constantly improving thanks to early diagnosis [5]. Distant metastases occur in 3% to 20% mainly involving lungs and bones [1,2]. These metastases significantly reduce patient's survival by more than 50% [6,7]. Cranial involvement is rare but described in the literature. The largest cohorts which were Korean and Chinese studies reported frequencies of 0.32% and 0.19%, respectively [6,3]. Prognostic factors for the development of metastases of thyroid cancer are predominantly female sex, age > 45 years, differentiation degree, and follicular histological type [3,5]. These metastases generally occur in the long term of a diagnosed thyroid cancer. Cases of metastases indicative of thyroid cancer are rare [8,9] as the case we present. In literature, the majority of cranial lesions described were located mainly on the vault: occipital bone was the first seat, followed by parietal and frontal bone in similar proportions [3,5,9,10]. Lesions also included sphenoidal and ethmoidal sinuses [11], pituitary gland [12], pontocerebellar angle [13] and parapharyngeal region [14]. The case of our patient was an advanced aggressive and life-threatening case due to significant delay in diagnosis. At this stage of discovery, rarely found in the literature, no surgery was possible. The destitution and lack of access to care for some populations in our country still reveal these late stages of cranial metastases. Imaging results showed massive right orbitofacial lesions, sinus lesions, and skull base, including the cavernous sinus. These craniofacial lesions had as main differential diagnosis when imaging a sarcoma in front of the hypervascularized osteolytic tumor process with necrotic zones. The presence of primary thyroid site with similar morphological features has evoked the diagnosis of metastatic carcinoma of the thyroid gland with a confirmed papillary histological type after biopsies. The current therapeutic management of cranial metastases includes surgical excision of thyroid and cranial metastases when possible, radioactive iodine, external radiotherapy, and targeted therapy, as appropriate [1,2]. The prognosis of these patients may be worsened by appearance of extracranial metastases or local and regional progression of disease leading to death [2,3]. Survival appears to improve when 1 or 2 cranial sites are present without association with intracranial lesions [3,9]. This case illustrates the relevance of early management of patients for improving their survival prognosis.

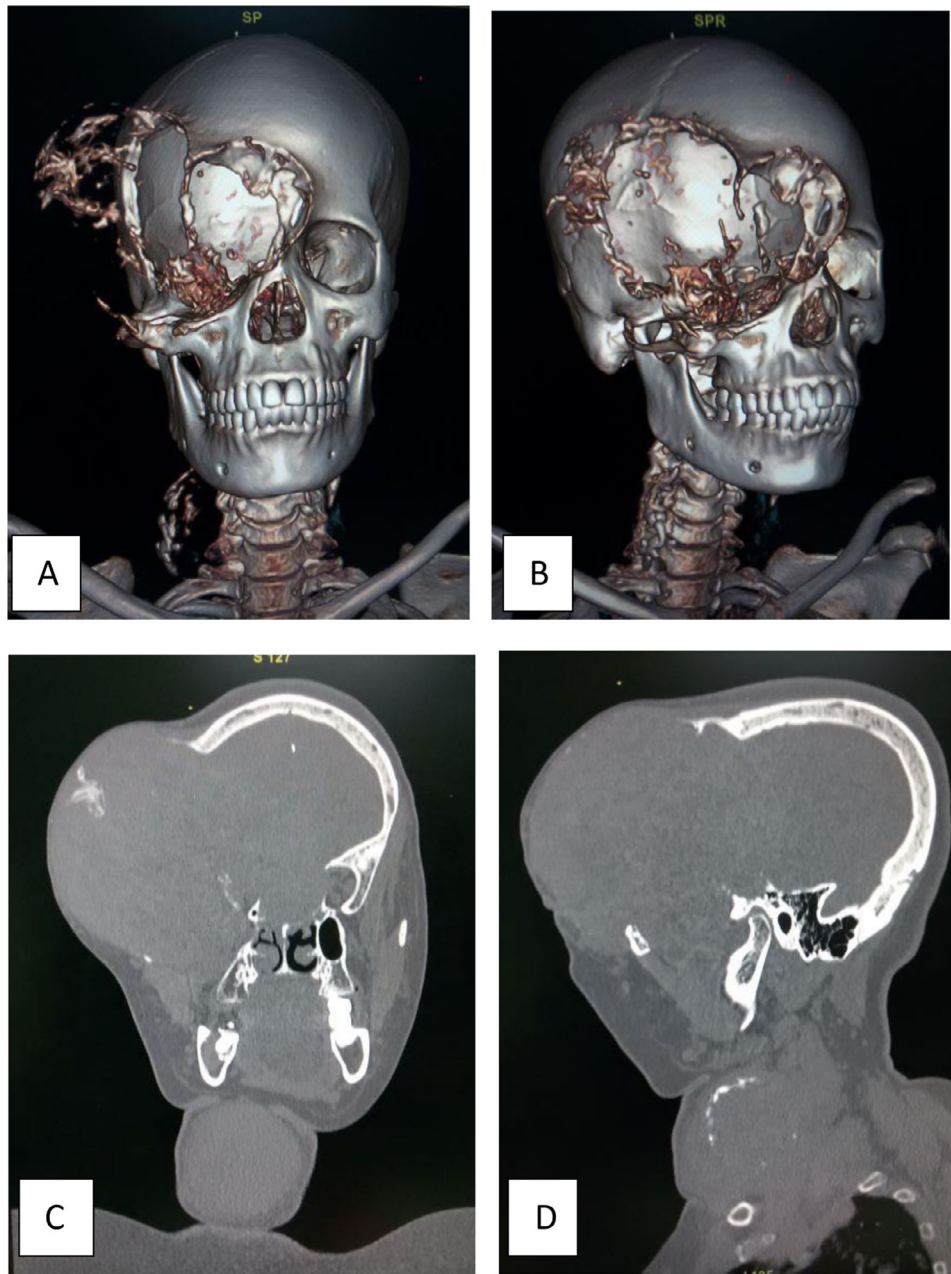


Fig. 2 – 3D reconstruction (A: Face; B: Oblique); Frontal (C) and sagittal (D) bone sections with the massive craniofacial and orbital osteolysis

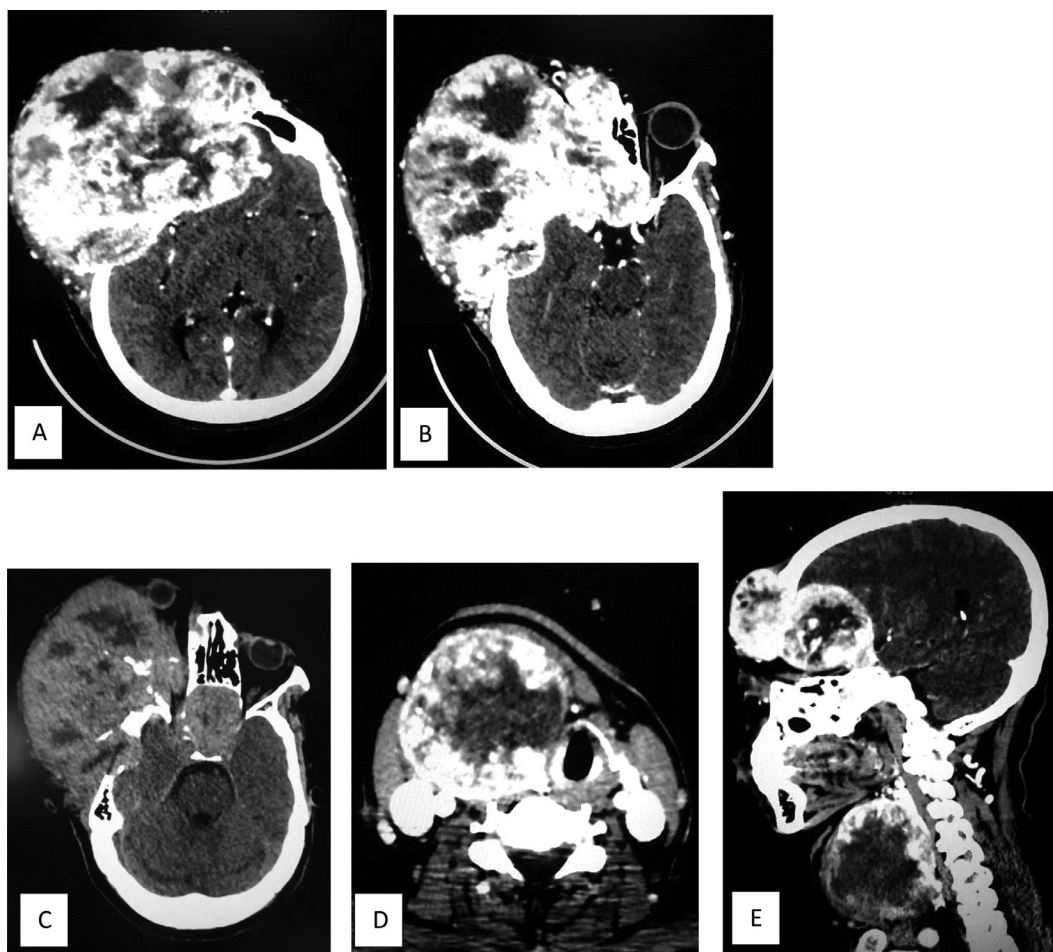


Fig. 3 – Axial sections with contrast injection (A, B) showing the highly vascularized craniofacial tumor, with endocranial involvement (facial sinuses, extradural space). Axial section without contrast medium injection (C) showing a right orbital extension of the tumor with exophthalmos. Axial and sagittal sections (D and E) showing the thyroid tumor with similar CT characteristics to the craniofacial mass

Conclusion

Aggressive craniofacial metastatic disease of thyroid cancer with extradural extension and brain engagement is caused by late management in a context of limited access to health cares. Imaging is used for exhaustive lesion assessment and treatment remains limited with surgical contraindication. At this stage, the disease prognosis is poor.

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