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CASE REPORT

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Apoplexy in pituitary metastasis revealing a lung carcinoma

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Abstract

Pituitary metastasis (PM) is an uncommon manifestation of systemic malignant tumours. It is the least common site of intracranial metastases. As PM has no clinical or radiological pathognomonic features, their diagnosis is challenging. Herein, we present a rare case of a PM unveiling lung cancer. A 60-year-old male with no medical history of malignancy was admitted with a sudden headache, retro-orbital pain, and a severe loss of both eyes' visual acuity. After proper investigations and endoscopic resection of the sellar mass, the diagnosis was confirmed to be pituitary metastasis of lung carcinoma. PM can be the initial presentation of an otherwise unknown malignancy. Their diagnosis and management are complex and depend on many factors. Endoscopic surgical resection provides histopathological proof, helps with symptomatic relief, and improves the quality of life but has no effect on survival.

KEYWORDS

apoplexy, endoscopic surgery, hypopituitarism, lung cancer, pituitary metastasis

INTRODUCTION

Pituitary lesions are one of the most common intracranial masses, found in about 20% of the population.[1] The most frequent ones are benign pituitary adenomas, representing 75% of all tumours of the sellar region.[2] Metastatic involvement of the pituitary gland is a rare occurrence and can be the first presentation of neoplastic disease. Its prevalence is less than 1% of surgically-removed pituitary lesions.[3] However, this incidence is increasing due to the improvement in the treatment of cancer which may have resulted in improved cancer survival and therefore an alteration of the metastatic pattern of cancer.[3]

Breast and lung cancer are the most common primary neoplasms causing pituitary metastasis (PM). In this article, we report the case of apoplexy in a PM unveiling a lung carcinoma.

CASE REPORT

A 60-year-old male with smoking habits was admitted as an emergency in our hospital with sudden headache, retro-orbital pain, and a severe loss of both eyes' visual acuity. He had no medical history of malignancy. An ophthalmic exam revealed bilateral mydriasis with no light perception in both eyes. Direct and consensual pupillary light reflex tests showed no response.

A CT scan of the brain was performed showing a lesion expanding into the pituitary fossa with suprasellar extension with homogenous enhancement (Figure 1). An MRI of the brain revealed a 25 × 21 × 27 mm lesion extending from within the pituitary fossa into the suprasellar cistern, lifting and stretching the optic chiasm, invading both cavernous sinuses (Knosp 2 on the left and Knosp 1 on the right) which was suggestive of an invasive pituitary macroadenoma (Figure 2).

In the preoperative preparation, we performed hormonal tests showing a panhypopituitarism with low levels of gonadotropic (FSH = 1 UI/l and LH = 0.1 UI/l), thyrotropic (TSH = 0.16 mUI/l), and corticotropic (Cortisolemia = 8 nmol/L) hormones. The patient was started on replacement therapy with prednisolone and levothyroxine. He underwent a chest X-ray which was abnormal. It showed a left retrocardiac opacity, a left pleural effusion, and an elevated left hemidiaphragm (Figure 3).

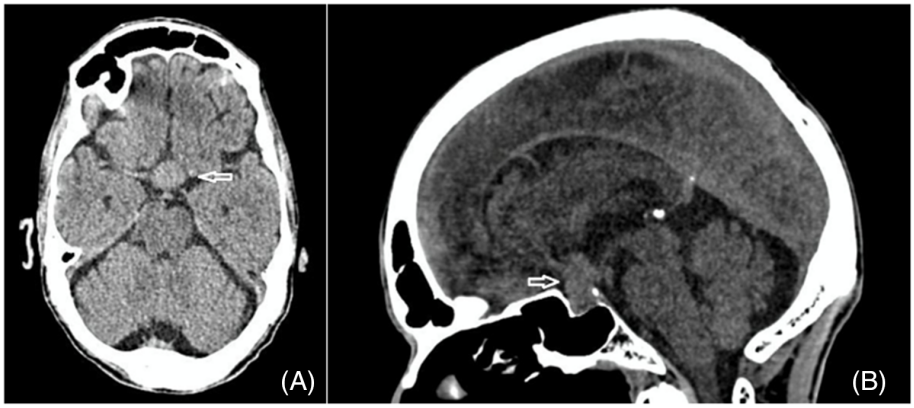

FIGURE 1 CT scan of the brain (A) axial view (B) sagittal view showing an isodense intrasellar mass with suprasellar extension

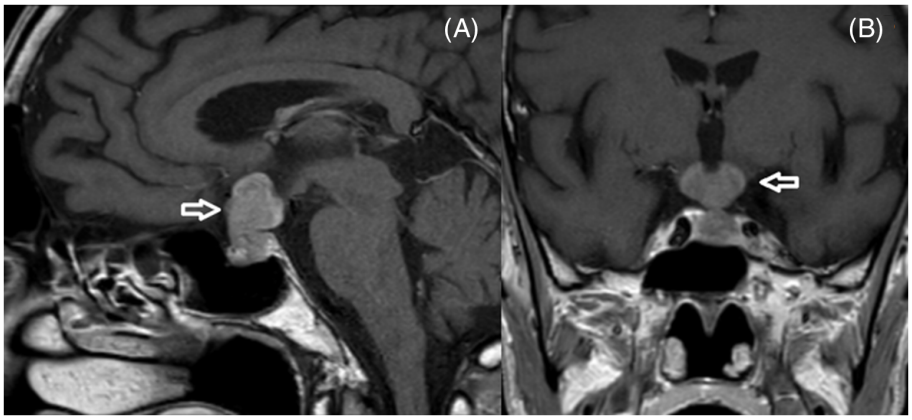

FIGURE 2 (A) Sagittal and (B) coronal MRI on T1-weighted images with gadolinium showing an intrasellar mass with suprasellar extension

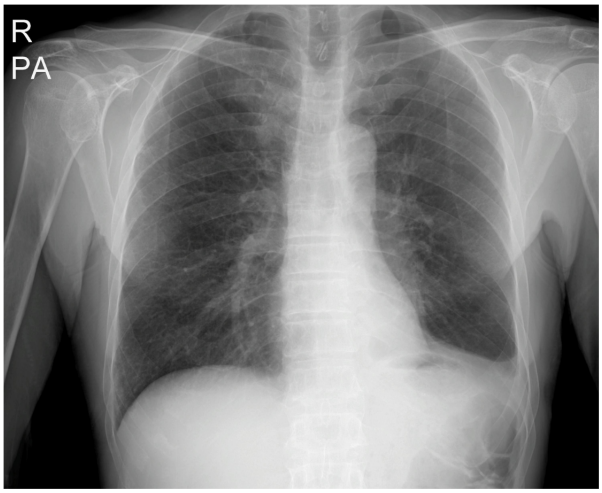

FIGURE 3 Histopathological examination: Invasive carcinomatous proliferation, made up of diffuse patches, with a few thin-walled vessels (A, HE ×4) and focally necrotic (B, HE ×4). The tumour cells are polygonal, with a cytoplasm of moderate abundance sometimes eosinophilic (C, HE ×40), sometimes clear vacuolated (D, HE ×40), and with voluminous nuclei presenting marked atypia and numerous mitoses

The patient underwent surgery under general anaesthesia. We performed a subtotal resection of the lesion, via an endoscopic transsphenoidal approach, and tumour tissue was sent for histopathological and immunohistochemical examinations. During the surgery, the tumour was found to be firm and vascular. The postoperative course was uneventful. The visual loss and the hypopituitarism persisted.

The histopathological and immunohistochemical report confirmed a metastatic carcinoma with primary lung origin (Figures 4 and 5). The tumour was positive for TTF-1, CK20, and CK7. The final diagnosis was pituitary metastasis of a small cell cancer.

The patient underwent a whole-body CT scan that revealed a left lung mass (Figure 6). Furthermore, an MRI of the spine showed a metastatic lesion in the L4 vertebrae.

The Karnofsky Performance Status Scale was 40%. Because of the poor prognosis, we elected a palliative/hospice care approach. One month later, the patient died due to a massive pulmonary embolism.

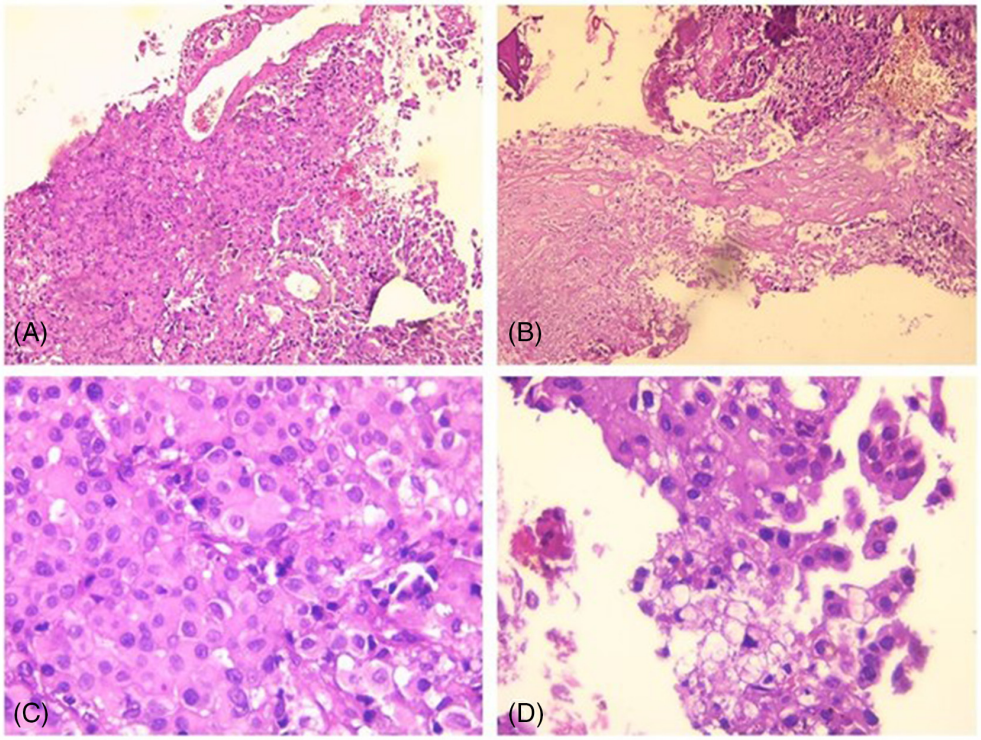

FIGURE 4 Immunohistochemical examinations: Tumour cells intensely and diffusely expressed cytokeratin 7 (CK 7) (A) and TTF1 (D). They did not express cytokeratin 20 (CK 20) (B) and P40 (C)

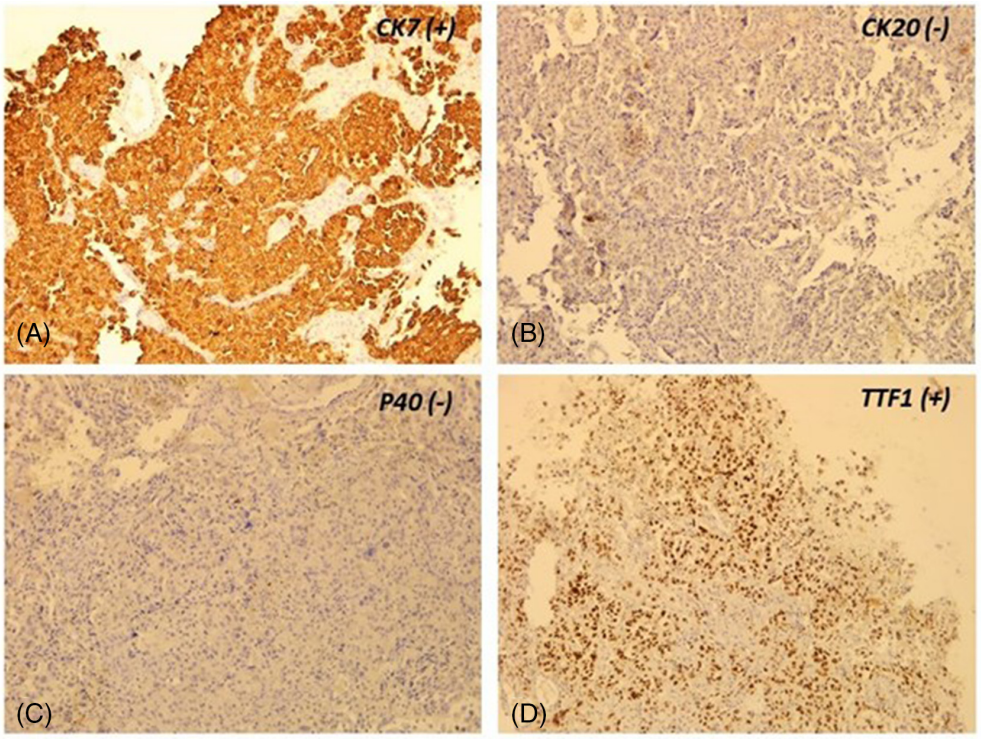

FIGURE 5 CT scan axial view showing left mass in the left lower lung lobe

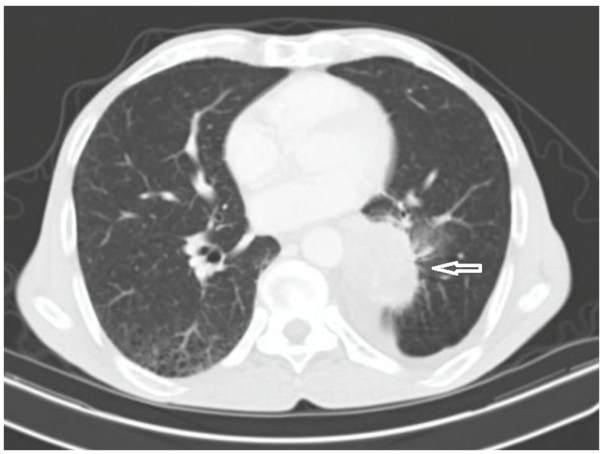

FIGURE 6 CT scan axial view showing left mass in the left lower lung lobe

DISCUSSION

Metastatic disease of the pituitary gland is a rare condition. PM accounts for less than 1% of surgically-removed pituitary lesions and 0.4% of intracranial metastases.[3] However, its prevalence in autopsy series was estimated to be higher and varies between 1% and 4% in patients with advanced cancer, which suggests that this entity may go undiagnosed.[4]

The most common cancers metastasizing to the pituitary gland are breast and lung carcinomas responsible for more than half of all reported cases of PM.[3] Other primary cancers responsible for PM in 3%–5% of cases include kidney, prostate, and colon.[3,5]

Several mechanisms of metastatic spread to the pituitary have been proposed, such as the direct haematological spread, spread through the hypothalamic portal vessels, meningeal spread via the suprasellar cistern, and skull base metastasis.

Even though PM tends to occur in patients with known metastatic cancer, symptomatic pituitary metastases may be the initial presentation of an unknown malignancy.[6] In a case series of 157 cases of PM in Japan, 10.8% detection of pituitary metastasis was initial to diagnosing the primary lesion.[7] Different reports found that most cases of PM preceding the diagnosis of malignancy originated from lung cancers, as is for our case.[6]

In their review, Henry et al. found that PM occurs most often between the ages of 60 and 70 years with no difference between the two genders.[3]

The clinical presentation of PM is variable and nonspecific. Most PMs were asymptomatic and discovered incidentally on imaging studies performed for other clinical reasons.[2] Similar to pituitary adenomas, symptoms of hypopituitarism are the presenting complaint in 20%–30% of patients with PM.[2] In 2018, Castle-Kirszbaum et al. reviewed 12 case series of PM and demonstrated that diabetes insipidus and pituitary dysfunction are the most common clinical symptoms, and the posterior pituitary is more likely to be the site of metastasis due to blood supply from the systemic circulation via hypophyseal arteries in contrast to the anterior pituitary, which is supplied through the portal circulation.[8] As a result, central diabetes insipidus is the most common hormonal abnormality with an incidence of 61%.[1,2] However, recent series suggest that the anterior pituitary is involved in more than 70% of cases.[6] Visual acuity and fields are frequently affected in PM. A review of 289 cases of PM found that visual dysfunction was the most common first manifestation, occurring in nearly half of the cases.[9]

Many radiographic features have been proposed to distinguish it from pituitary adenomas. The rapid growth over a short period, the bone destruction rather than remodelling, and the irregular edges are highly suspicious of metastasis. PM on pituitary MRI can appear as dumbbell-shaped as the sellar diaphragm has not had time to stretch.[2,6] Other findings that suggest the diagnosis of PM are stalk enhancement with thickening, and loss of the posterior lobe bright spot but are not specific.

Until today, there is no consensus on how best to manage PM due to a paucity of data. It depends on the symptoms, the extent of the lesion, the stage of the primary malignancy, and other comorbidities. The treatment options include hormone replacement and a combination of surgery, chemotherapy, and/or radiotherapy.

Total resection via the trans-sphenoidal approach is difficult. Endoscopic trans-sphenoidal excision and debulking of PM provide an accurate histological diagnosis and seem to have beneficial effects on symptom relief but do not affect survival.[2,3] However, recently metastatic resection was suggested to provide a survival benefit.[6] Another option for a patient with limited survival is stereotactic radiosurgery which has proven to be safe and effective for growth control after diagnosis.[7]

Patients with PM were found to have a poor prognosis since PM has been associated with end-stage disease. The estimated survival is between 10.7 and 25.4 months (median of 16.5 months).[2] However, a three-year survival was found in one patient in a retrospective study of 10 patients.[10] Lopes reinforces the importance of considering multimodal interventions directed at PM as it improves the survival of patients with PM.[6]

AUTHOR CONTRIBUTIONS

Patient management: Mohamed Amine Hadj Taieb, and Kais Maamri. *Data acquisition*: Amine Trifa and Mohamed Ghorbel. *Manuscript preparation*: Mohamed Amine Hadj Taieb, Kais Maamri, and Mohamed Ghorbel. *Image selection*: Mohamed Amine Hadj Taieb and Ghassen Elkahla. *Manuscript review*: Mehdi Darmoul.

CONFLICT OF INTEREST

None declared.

DATA AVAILABILITY STATEMENT

Data sharing not applicable

ETHICS STATEMENT

The authors declare that appropriate written informed consent was obtained for the publication of this manuscript and accompanying images.

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