Case Report

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Apoplexy in a Metastatic Pituitary Mass: A Rare Occurrence

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ABSTRACT

Pituitary apoplexy resulting from metastatic disease is an uncommon and rapidly progressive clinical presentation. This report details the case of a gentleman who presented with episodic severe headaches, a unilateral third nerve palsy, and progressive visual field loss. Initial blood tests indicated an abnormal pituitary hormone profile, while MRI imaging revealed a sellar mass exhibiting features consistent with apoplexy. Due to the acute threat to his vision, an urgent review was conducted at a pituitary multidisciplinary meeting, leading to endoscopic transsphenoidal decompression. The patient had a prior history of colorectal cancer, treated 18 months earlier and previously regarded as in remission. Subsequent histological analysis confirmed that the pituitary lesion was a metastasis from colorectal cancer. This case illustrates the diagnostic and therapeutic complexities inherent in managing this rare presentation.

Introduction

Pituitary apoplexy is characterised by acute haemorrhage or ischaemic infarction of the pituitary gland [1]. Its incidence among patients with pituitary adenomas varies widely, with many studies fail to distinguish between symptomatic apoplexy and incidental haemorrhage into an adenoma [1]. The pituitary gland is an unusual site for metastatic disease [2,3], and visual disturbance is typically the main presenting symptom [4]. To date, only a limited number of such cases have been reported in the literature [5].

This report describes a scenario that poses significant diagnostic challenges and for which there is no established consensus on optimal management.

Case Presentation

A 66-year-old gentleman developed gradually worsening headaches during a COVID-19 infection. Initially attributing his symptoms to the viral illness, he later experienced increasing headache severity, prompting a contrast-enhanced CT head, which demonstrated a sellar mass consistent with a pituitary macroadenoma with possible right cavernous sinus extension. Shortly afterwards, he developed

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diplopia while driving and sought medical attention. Examination revealed a right third nerve palsy with ptosis. A repeat non-contrast CT head showed no significant interval change.

Subsequent MRI of the pituitary gland with gadolinium contrast confirmed a solid sellar lesion with suprasellar extension (Figure 1). Endocrine assessment demonstrated anterior hypopituitarism, including reduced random cortisol, hypogonadotropic hypogonadism, and secondary hypothyroidism (Table 1). Hydrocortisone and levothyroxine replacement were initiated. Ophthalmology evaluation confirmed a right third nerve palsy and bilateral superior temporal quadrantanopia, prompting urgent referral to the regional pituitary centre.

His background history included colorectal cancer diagnosed two years earlier, managed with surgery and chemotherapy and considered in remission. He had also undergone VATS wedge resection of a right lower-lobe lung nodule, with histology confirming metastatic colorectal adenocarcinoma; subsequent surveillance CT showed no residual disease. Additional past medical history included migraine with aura, hypertension, pre-diabetes, and right inguinal hernia.

At the regional pituitary multidisciplinary (MDT) clinic, his headaches had improved, but the third nerve palsy persisted. A plan was made for interval MRI surveillance. However, during a scheduled telephone review, he reported sudden worsening of headache and profound deterioration in right-eye vision, with only light–dark perception remaining. He was admitted urgently. Repeat MRI demonstrated intrasellar haemorrhage within an enlarging pituitary mass with progression of suprasellar and cavernous sinus extension (Figure 2).

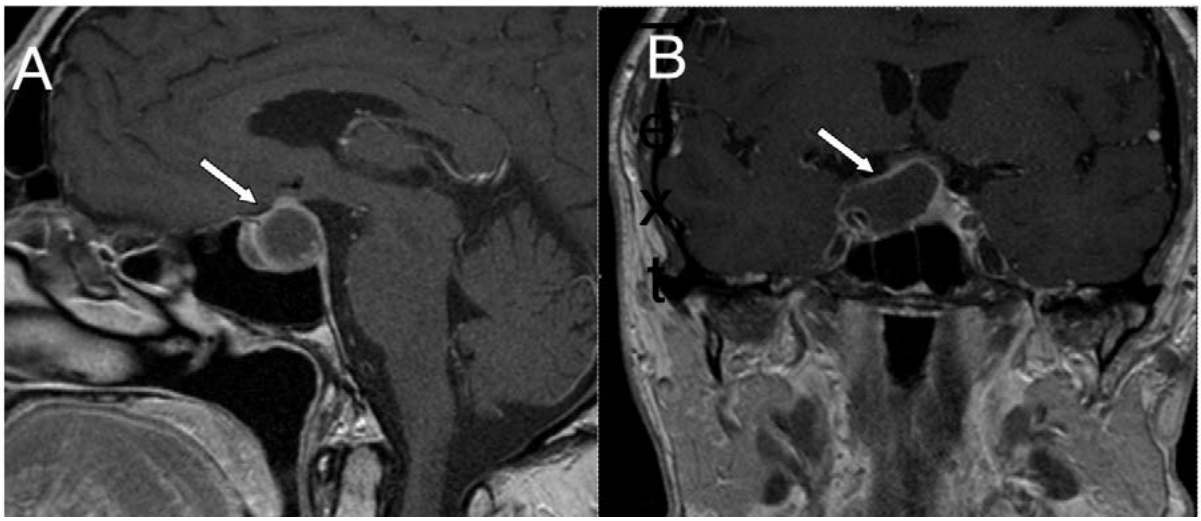

Fig. 1. MRI pituitary (January 2023) showing a solid lesion with suprasellar extension and right cavernous sinus infiltration.

Table 1. Initial Pituitary Hormone Profile (Early January 2023)

Test	Observed Value	Reference Range
IGF-1	23 nmol/L	5–28 nmol/L
Random cortisol	81 nmol/L	—
FSH	2.6 IU/L	1.4–18.1 IU/L
LH	1.2 IU/L	1.5–9.3 IU/L
Testosterone	0.8 nmol/L	6.51–23.74 nmol/L
Prolactin	3206 mU/L	63–262 mU/L
TSH	1.23 IU/L	0.1–5.0 IU/L
FT4	6.4 pmol/L	12–23 pmol/L
HbA1c	46 mmol/mol	—
Sodium	132 mmol/L	133–146 mmol/L
Potassium	4.2 mmol/L	3.5–5.3 mmol/L
Haemoglobin (Hb)	145 g/L	120–170 g/L

IGF-1 (insulin-like growth factor-1), FSH (follicle-stimulating hormone), LH (luteinising hormone), TSH (thyroid-stimulating hormone), FT4 (free thyroxine), HbA1c (glycated haemoglobin), and Hb (haemoglobin).

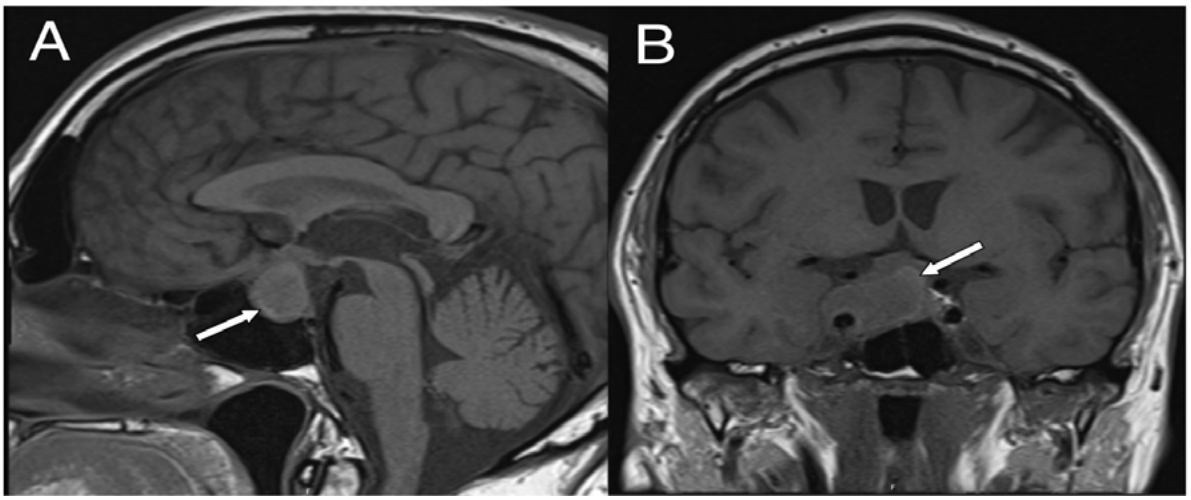

Fig. 2. MRI pituitary (February 2023) demonstrating intrasellar haemorrhage and interval enlargement with suprasellar and cavernous sinus progression.

Table 2. Pituitary Hormone Profile (February 2023)

Test	Observed Value	Reference Range
Prolactin	1096 mU/L	63–262 mU/L
FSH	2.2 IU/L	1.4–18.1 IU/L
LH	1.2 IU/L	1.5–9.3 IU/L
Testosterone	0.7 nmol/L	6.51–23.74 nmol/L
FT3	4.2 pmol/L	3.5–6.5 pmol/L
FT4	15 pmol/L	12–23 pmol/L
TSH	0.05 IU/L	0.1–5.0 IU/L
GH	0.8 µg/L	—
IGF-1	29 nmol/L	5–28 nmol/L
Sodium	145 mmol/L	133–146 mmol/L
Plasma osmolality	299 mOsm/kg	285–295 mOsm/kg
Urine osmolality	320 mOsm/kg	50–1200 mOsm/kg

FSH: follicle-stimulating hormone; LH: luteinising hormone; FT3: free triiodothyronine; FT4: free thyroxine; TSH: thyroid-stimulating hormone; GH: growth hormone; IGF-1: insulin-like growth factor-1.

Given the rapid visual decline, he underwent urgent endoscopic transsphenoidal decompression for optic apparatus relief and histological diagnosis. Preoperative visual fields confirmed bilateral superior quadrantanopia and a right third nerve palsy with ptosis and pupillary involvement. Post-operatively, he developed polyuria and rising serum sodium consistent with arginine vasopressin (AVP) deficiency and was commenced on desmopressin with close biochemical monitoring (Table 2). His visual function did not recover.

Histopathology revealed clusters of metastatic adenocarcinomas within necrotic and infarcted tumour tissue, with immunohistochemical staining supporting a colorectal origin. Follow-up MRI performed three months post-operatively demonstrated residual tumour in the right cavernous sinus and suprasellar region abutting the optic chiasm and right optic tract.

At the patient's request, follow-up care was transferred back to his local endocrinology and oncology teams. The case was reviewed in the colorectal and oncology MDTs, which recommended palliative radiotherapy. He completed approximately six weeks of treatment. Over the subsequent six months, he experienced progressive clinical decline, including gastrointestinal bleeding, oesophageal candidiasis, recurrent falls, urinary tract infection, and hyponatraemia. Radiotherapy was discontinued, and he was managed with palliative measures thereafter.

Discussion

The pituitary gland is an uncommon site for metastatic spread, and when it is involved, the outlook is generally poor [2]. Most secondary lesions in the sellar region arise from breast and lung cancers, with renal, prostate and gastrointestinal primaries-

including colorectal cancer-reported less frequently. Almost any solid or haematological malignancy, however, has the potential to metastasise to this area [3].

Published series indicate that pituitary metastases are often detected several years after the initial diagnosis of the primary tumour, with an average interval of roughly three years. Patients commonly present with visual symptoms, diabetes insipidus, headaches, fatigue or diplopia. Reported imaging patterns include thickening of the pituitary stalk, indentation at the diaphragmatic hiatus, and, in some cases, involvement of the hypothalamus or optic pathways. More favourable prognostic features include younger patient age, later onset of pituitary involvement relative to the primary diagnosis, smaller metastatic lesion size and the use of radiotherapy [4].

Distinguishing pituitary metastases from adenomas can be difficult. On MRI, metastases may demonstrate a "dumbbell-shaped" configuration due to constriction at the diaphragma sellae and may show sellar erosion without enlargement. Loss of the normal posterior pituitary bright spot has also been described [5]. Functional imaging with FDG-PET is of limited discriminatory value because benign adenomas may exhibit similar metabolic activity, leading to overlap in imaging appearances [2].

Management is complicated by the rarity of pituitary metastases and the generally limited life expectancy of affected patients, which reduces opportunities for robust clinical trials. The role of chemotherapy remains unclear. Surgical decompression may be justified for symptomatic relief-particularly to address visual compromise-but does not appear to improve overall survival [6]. Achieving complete resection is often not feasible due to invasion of surrounding neurovascular structures and the inherently vascular nature of metastatic lesions [6]. Stereotactic radiosurgery has been used as an adjunctive treatment in selected cases and may provide local tumour control, although its impact on long-term survival appears limited [7].

Pituitary apoplexy in the setting of metastatic disease is uncommon and may mimic apoplexy arising from a pituitary adenoma both clinically and radiologically. This possibility should be considered in patients with known malignancy who present with sudden visual or neurological deterioration. In the absence of specific guidelines, management of residual pituitary metastatic disease should follow established principles of systemic therapy for the primary malignancy [8].

Conclusion

Pituitary apoplexy associated with metastatic disease is a catastrophic complication with high mortality, even in specialised centres. This case highlights the challenges in management arising from limited evidence and the lack of established guidelines. The patient's rapid clinical deterioration, particularly the visual loss and MRI findings of intrasellar haemorrhage, emphasised the need for urgent intervention.

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Ethical Considerations

Ethical Approval and Consent

Written informed consent for publication of this case report and accompanying images was obtained from the patient's next-of-kin.

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Conflict of Interests

The authors have no conflict of interest to declare.

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