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Clinical Image

A Case of Pituitary Macroadenoma with Snowman Sign

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Abstract:

Pituitary adenomas commonly present with visual or hormonal disturbances, while vascular complications are rare and usually associated with pituitary apoplexy. We describe a 70-year-old man who presented with acute right upper limb weakness and dysarthria consistent with a transient ischemic attack. Magnetic resonance imaging (MRI) revealed a giant pituitary macroadenoma with bilateral parasellar extension, more pronounced on the right side, with encasement of the right cavernous carotid artery, giving it the appearance of the "snowman sign".

Keywords: *Cavernous sinus, Internal carotid artery, Parasellar extension, Pituitary macroadenoma, Snowman sign, Suprasellar extension, Transient ischemic attack.*

Introduction:

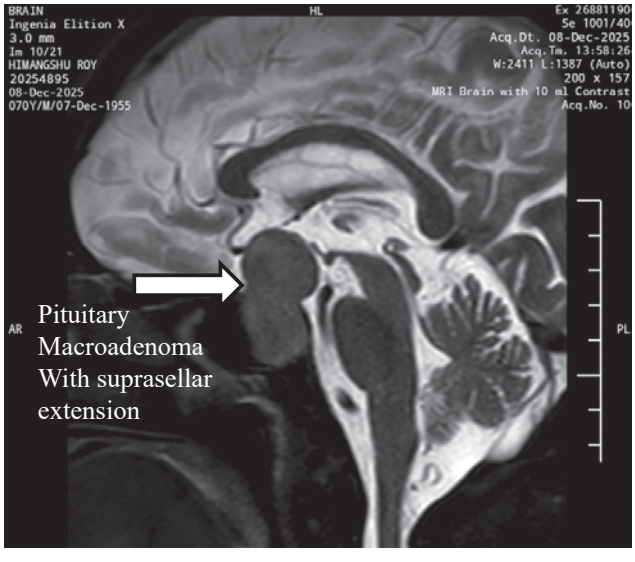
Pituitary adenomas (PAs) are common neuroendocrine intracranial tumors, accounting for approximately 10% of primary intracranial neoplasms[1]. They are classified as microadenomas (<10 mm) or macroadenomas (≥10 mm)[2]. Typical presentations include visual disturbances, incidental radiologic detection, and hypopituitarism due to compression of normal pituitary tissue [3]. With progressive growth, PAs may invade adjacent structures such as the cavernous sinus and, rarely, encase the internal carotid artery (ICA). We report a 70-year-old man who presented with a transient ischemic attack attributed to parasellar extension of a pituitary adenoma causing encasement of the right cavernous ICA.

Case History:

A 70-year-old man with hypertension, type 2 diabetes mellitus, and alcoholic liver cirrhosis presented with a 6–7 hour history of acute right upper limb weakness. On admission, he was drowsy with dysarthria and right upper limb hypertonia. CT brain showed an enlarged sella with a suprasellar mass, without acute infarct or hemorrhage. He was monitored in the high-dependency unit, where his neurological deficits resolved completely within hours, with full recovery of consciousness and motor function.

Further evaluation with magnetic resonance imaging (MRI) of the brain demonstrated a large dumbbell-shaped pituitary macroadenoma (4.0 × 2.7 × 3.8 cm) with sellar expansion, suprasellar extension compressing the optic chiasm, right parasellar extension encasing the right cavernous carotid artery, and early left parasellar involvement. Carotid Doppler showed no significant stenosis.

Hormonal assessment demonstrated the following: prolactin 6.40 ng/mL (reference range 2.1–17.7), serum cortisol at 9:00 AM 621 nmol/L, serum cortisol at 5:00 PM 459 nmol/L, TSH 1.21 uIU/mL (0.35–4.94), FT4 0.88 ng/dL (0.89–1.76), FSH 25.32 mIU/mL (male reference 3.1–34.6), LH 1.18 mIU/mL (1.5–9.3), and ACTH 9.83 pg/mL (7.20–63.30), consistent with a non-functioning pituitary macroadenoma.



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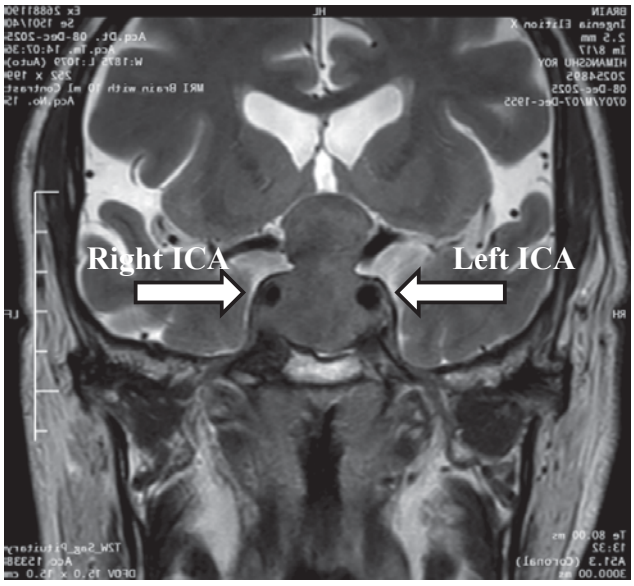

Figure 1 and 2: A 'snowman' shaped pituitary macroadenoma in sella with significant suprasellar extension, producing critical right cavernous carotid artery encasement shown in MRI of Brain.

MRI Brain (Fig 1 and 2) revealed a large 'snowman' shaped pituitary macroadenoma in sella with significant suprasellar extension, producing critical right cavernous carotid artery encasement.

The patient was stabilized and transferred to a cabin. Neurosurgical consultation was obtained, and surgical resection was advised. However, the patient was subsequently discharged at the request of his family with advice to consult with neurosurgeon for further treatment.

Discussion:

Pituitary tumors have complex and diverse clinical traits and display a wide range of proliferative and invasive tendencies. Other aggressive pituitary tumors are asymptomatic and maintain their size for a long time, whilst some aggressive pituitary adenomas grow quickly and are resistant to conventional therapy[4]. Approximately 40% of pituitary adenomas are macroadenomas, which may progressively enlarge and extend into the suprasellar region, cavernous sinus, and sphenoid sinus. As the tumor grows superiorly, bilateral indentation by the diaphragma sellae can produce the characteristic "snowman" configuration on neuroimaging[5].However, this appearance is not specific and may also be seen in other pituitary diseases, such as lymphocytic hypophysitis, meningioma of the sellar region, Rathke cysts or craniopharyngioma[6].

The evaluation of a patient with a probable pituitary adenoma consists of imaging, endocrine assessment, ophthalmology examination and histology. Magnetic resonance imaging (MRI) scanning of the pituitary region, with sagittal and coronal reconstruction, is the gold standard imaging method for pituitary disease.

Although cases of carotid artery occlusion caused by other intracranial lesions, such as tumors and large aneurysms, have been reported, compression or occlusion of the ICA by pituitary adenomas is extremely rare, particularly in the absence of apoplexy[7].

In the present case, magnetic resonance imaging revealed complete encasement of the right cavernous ICA with predominant parasellar extension, indicating that mechanical impairment of cerebral blood flow due to transient carotid artery vasospasm was the most probable cause.

Pituitary adenomas may be managed surgically or, in selected cases, conservatively, with treatment decisions guided by a multidisciplinary team. Surgery is typically performed via microscopic or endoscopic transsphenoidal approaches. However, tumors with extensive invasion of adjacent neurovascular structures remain challenging, carrying higher morbidity, mortality, recurrence rates, and poorer long-term outcomes.[8]. Unfortunately, in this case, immediate definitive surgical management could not be pursued due to patient and family preference.

Conclusion:

The "snowman-shaped" appearance is a well-recognized imaging feature of large pituitary macroadenomas and has been reported in up to 55.6% of cases[9]. This case illustrates a rare presentation of a pituitary macroadenoma with cavernous internal carotid artery encasement, presenting as a transient ischemic attack in the absence of pituitary apoplexy. In addition to other etiology, clinicians should consider sellar and parasellar lesions in the differential diagnosis of transient focal neurological deficits.

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