

# Isolated Abducens Nerve (Sixth Cranial Nerve) Palsy as Initial Manifestation of Pituitary Macroadenoma in a 64-year-old Male: Case Report

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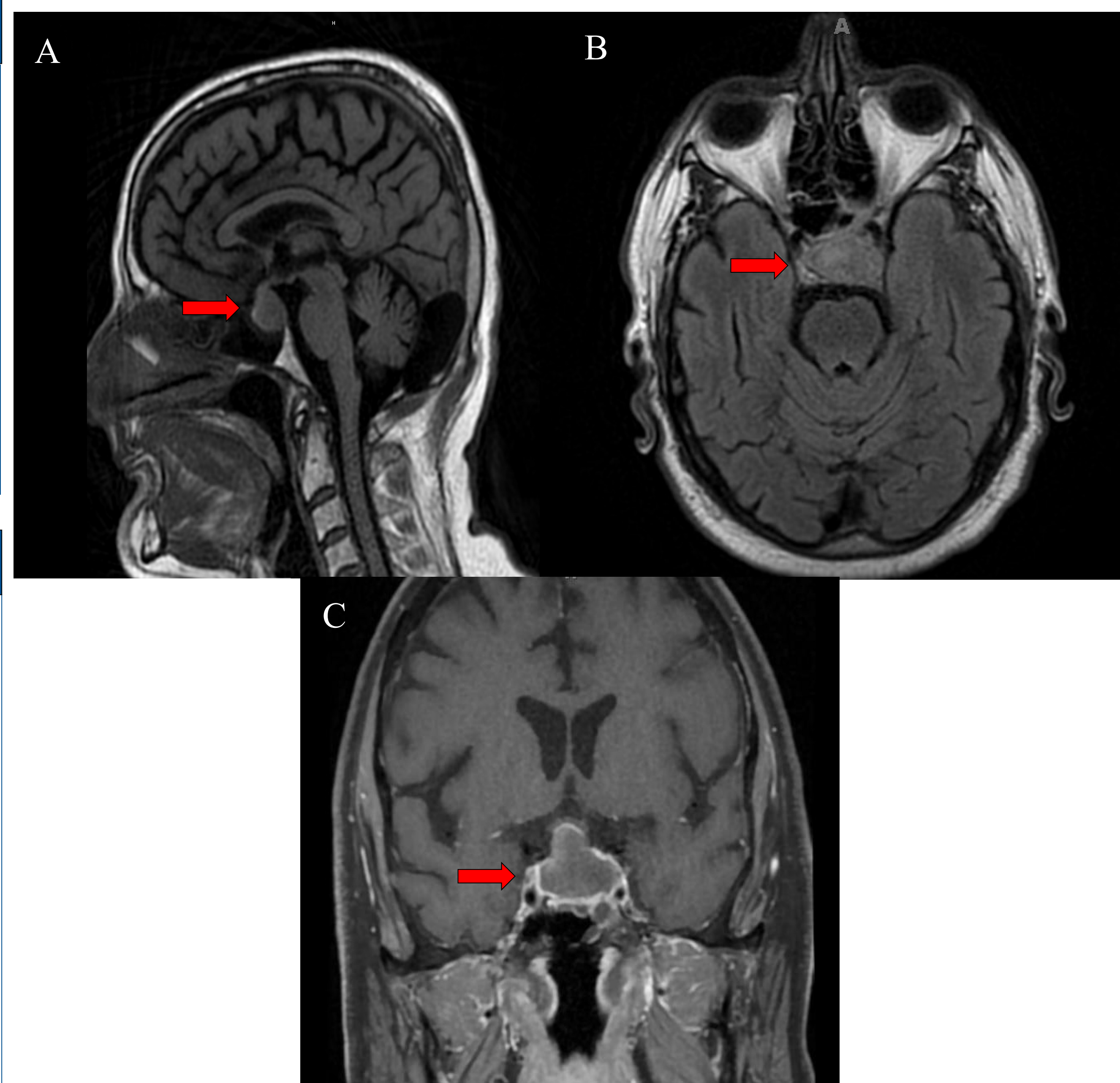
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## INTRODUCTION

- Pituitary macroadenomas, adenomas larger than 1 cm, can lead to compression of the optic chiasm and affect nearby structures like cranial nerves due to their size and potential expansion.
- Isolated ocular nerve palsies are rarely the initial manifestation of these tumors, with only a few reported cases.<sup>(1)</sup>
- It is even more infrequent for the sixth cranial nerve to be affected due to its sheltered position within the cavernous sinus.<sup>(1)</sup>
- We present a case involving a 64-year-old male who presented to the hospital with isolated abducens nerve palsy, which was later found to be caused by a macroadenoma.

## CASE PRESENTATION

- Patient is a 64-year-old male with past medical history of hypertension and coronary artery disease who presented to the emergency department for evaluation of progressive diplopia and severe headache over the course of one week.
- During the initial evaluation, his vital signs were stable without any notable abnormalities.
- On physical examination, the patient exhibited left eye ptosis and inability to perform abduction. The rest of the physical exam was unremarkable.
- Brain MRI revealed a large 2.6 cm complex cystic peripherally enhancing mass in the sella turcica, extending to the suprasellar cistern and displacing the optic chiasm. The findings were indicative of a large pituitary macroadenoma with possible central necrosis or hemorrhage.
- Despite the tumor's size and extension, only the sixth cranial nerve was affected; the others remained intact.
- Significant laboratory results indicated hypopituitarism resulting from a non-functioning pituitary macroadenoma, as evidenced by low levels of ACTH (3 pg/mL), TSH (0.146  $\mu$ U/mL), LH (0.5 mIU/mL), FSH (0.5 mIU/mL), and prolactin (5 ng/mL).
- The patient received care from a team of a neurologist, neurosurgeon, and endocrinologist.
- Steroids and thyroid replacement therapy were started while the patient was hospitalized.
- Throughout the hospital stay, the patient remained stable. Despite persistent diplopia, there was near complete resolution of his headache.
- Following extensive discussion, outpatient surgical planning was decided upon.



T1-weighted Sagittal (A), Axial (B), and Coronal (C) magnetic resonance images of the brain depicting a 2.6 cm complex cystic peripherally enhancing mass in the sella turcica, extending to the suprasellar cistern and displacing the optic chiasm (red arrows).



Limitation of left eye abduction on lateral gaze, suggesting left abducens nerve palsy.

## DISCUSSION

- Pituitary adenomas are benign and slow-growing neoplasms of the anterior pituitary gland. They are the most common cause of sellar masses after the third decade of life, accounting for up to 10% of all intracranial neoplasms.<sup>(1,2)</sup>
- Pituitary adenomas are classified according to their size (microadenomas <1 cm, macroadenomas  $\geq$ 1 cm) and originating cell type (somatotroph, lactotroph, thyrotroph, gonadotroph, and corticotroph).
- Macroadenomas constitute approximately 40% of pituitary adenomas, with clinically nonfunctioning macroadenomas accounting for about 80% of all macroadenomas.<sup>(3,4)</sup> These tumors can compress critical structures such as the optic chiasm, pituitary stalk, and the cavernous sinus. Superior expansion can result in dysfunction of the optic nerve and optic chiasm, while lateral expansion can affect cranial nerves III, IV, V, and VI.<sup>(5)</sup> They are also associated with hypopituitarism due to compression of the normal anterior pituitary and/or pituitary stalk, hindering the stimulation of pituitary cells by hypothalamic factors.<sup>(6)</sup>
- Visual field defects are frequently observed with macroadenomas, whereas ocular palsies are rare occurrences. Despite their rarity, such palsies can occur. The third cranial nerve (oculomotor nerve) is more susceptible due to its anatomical location, while involvement of the sixth cranial nerve (abducens nerve) is infrequent due to its sheltered position within the cavernous sinus.<sup>(5)</sup> However, sixth cranial nerve palsy has been reported as an isolated and initial presentation of macroadenomas.<sup>(1)</sup> The presented case highlights this rarity, portraying an isolated sixth cranial nerve palsy as the initial manifestation of a macroadenoma.
- Transsphenoidal surgery is the preferred treatment for patients with macroadenomas, especially in those patients experiencing ocular symptoms. Surgery typically results in approximately 80% improvement in vision postoperatively.<sup>(7)</sup> However, it's essential to recognize that despite surgical intervention, hypopituitarism persists in most cases. This emphasizes that the primary goal of surgery is to restore visual function rather than improve pituitary function. Treatment to enhance pituitary function involves hormone replacement therapy.
- This patient's presentation highlights the importance of considering an isolated sixth cranial nerve palsy as an initial manifestation indicative of a pituitary macroadenoma. It is crucial to include pituitary macroadenomas in the differential diagnosis to promptly identify and treat these cases appropriately, thus preventing irreversible harm.

## REFERENCES

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