

Pituitary Adenoma Presenting with True Bitemporal Hemianopsia: A Case Report

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Abstract

Pituitary adenomas grow from the anterior pituitary gland and can cause compression of surrounding structures, including the optic chiasm, leading to visual field defects such as bitemporal hemianopia, visual acuity or color perception reduction. In this case report, we present the case of a 45-year-old male patient who presented with long-lasting headaches and visual disturbances, including diplopia and a decline in visual acuity. Despite being initially diagnosed with migraine by a neurologist, a thorough ophthalmological examination revealed visual field defects consistent with true bitemporal hemianopsia. MRI results confirmed the presence of sellar mass, and the patient was referred to the neurosurgery department for immediate intervention. The patient underwent surgical removal of the mass, which was identified as a pituitary adenoma upon histological examination. Three months later, the patient experienced significant improvements in subjective and objective visual acuity, with no diplopia or scotomas in the visual field. In conclusion, this case report highlights the importance of considering pituitary adenoma as a potential cause of visual disturbances, even in the absence of bitemporal hemianopsia. Thorough ophthalmological examination, including visual field testing, can aid in the early detection of chiasmal involvement and prompt referral for further investigation. Early intervention, including surgical removal of the tumor, can prevent other complications and significantly improve visual acuity and overall quality of life for patients. (**International Journal of Biomedicine. 2023;13(2):353-356.**)

Keywords: pituitary adenoma • sellar mass • bitemporal hemianopsia

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Introduction

Pituitary adenomas account for approximately 15% of all brain tumors. They are the most common cause of sellar tumors after the third decade of life, representing 90% of all sellar masses.^(1,2) Visual impairment is primarily due to suprasellar tumor extension with optic chiasm compression, which leads to visual field defects such as classical bitemporal hemianopia, visual acuity or color perception reduction,

and optic nerve atrophy.⁽³⁾ Pituitary adenomas, which grow upward from the pituitary stalk, compress the chiasm from below, preferentially involving the inferior, nasal, and macular nerve fibers. Vision loss due to compression first affects the supertemporal visual fields, then inferotemporal, inferonasal, and finally, superonasal fields.⁽⁴⁾ There is clinical significance to the detection of visual field loss in pituitary disease, and capturing peripheral loss is important to the early diagnosis of chiasmal involvement.⁽⁵⁾ Even though Putri et al.,⁽⁶⁾ have

described bitemporal hemianopsia as the most common visual field defect of chiasmal compression, in a study involving 115 patients with pituitary macroadenoma conducted by Lee et al.,⁽⁷⁾ 89 of them presented with a visual field defect but only one of them presented with true bitemporal hemianopsia. Even though bitemporal and mixed defects are the most common, bitemporal hemianopsia is extremely rare in patients with macroadenoma, according to this study.

Case Presentation

We present a case of a 45-year-old male patient, with the main complaints being long-lasting headaches and visual disturbances, mainly in the form of double vision (diplopia) over the past three months. He has been receiving continuous treatment for headaches using analgesics but still experiences persistent headaches with no signs of relief. Initial consultations with a family doctor were unsuccessful, and he is recommended to see a neurologist, who diagnoses him with migraine and starts the treatment. The patient came to our clinic for a check-up after being referred by his previous doctor. His complaints of diplopia were continuing. Furthermore, he was experiencing a decline in visual acuity in the last two weeks. He also reported seeing shadows and was in an unstable mental state, anxious and unfocused.

At examination: The patient's right eye visual acuity is 20/32 without correction, while the left eye visual acuity is 20/63. Intraocular pressures measure 12mmHg for the right eye and 13mmHg for the left eye, respectively. No pathological changes were observed in the anterior segment; the cornea was transparent, the pupil reacted well to light in the right eye, and there was a relatively mild afferent pupillary defect in the left eye, with no change in the iris. Sub-atrophy of the optic nerve head was observed in the posterior segment, more pronounced in the left eye. The macula showed no pathological changes, and neither did the retinal vessels. We performed visual field testing (perimetry), and the results showed defects in the visual field, specifically a true bitemporal hemianopsia (Figure 1). Concretely, a temporal scotoma with the nasal portion preserved was observed in the right eye. A temporal scotoma and defects with partial involvement of the upper and lower nasal quadrant were perceived in the left eye. After this thorough examination, the patient's symptoms prompted a referral to the radiology clinic for further investigation. An MRI of the head was ordered, and the results indicated the presence of a sellar mass (Figure 2).

Given the severity of the situation, the patient was referred to the neurosurgery department for immediate intervention. A team of experienced neurosurgeons evaluated the patient's case and determined that it was necessary to remove the surgical mass to prevent further complications. The patient underwent a surgical procedure, which involved careful removal of the sellar mass. Following the procedure, the patient was closely monitored and received appropriate care by a multidisciplinary team of healthcare professionals involved in the patient's care to ensure that the patient received the best possible treatment to maximize the chances of a successful outcome and recovery. Postoperative MRI findings are illustrated in Figure 3.

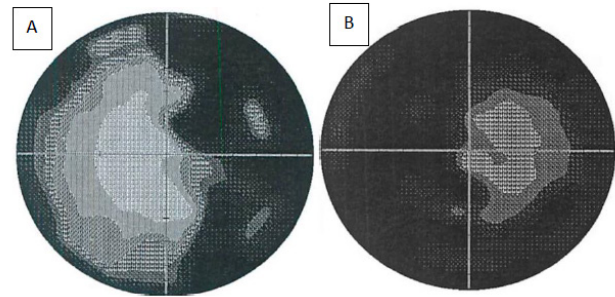


Fig. 1. Visual acuity measured through perimetry at first examination in the clinic. A) Right eye; B) Left eye

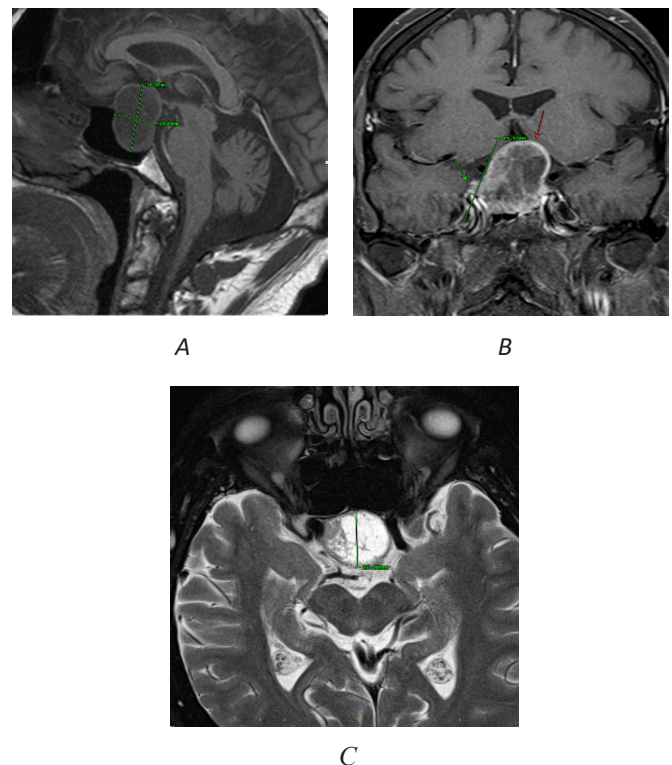
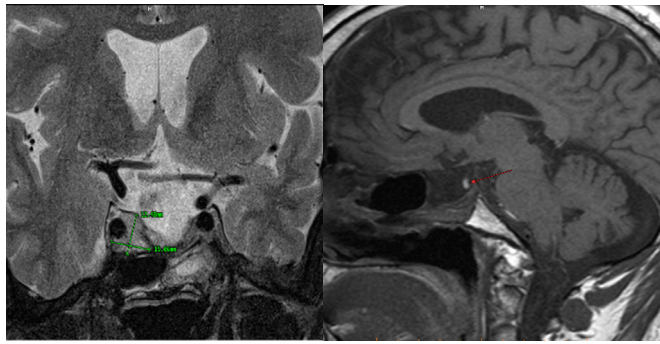


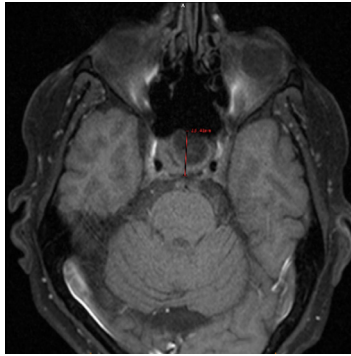
Fig. 2. Preoperative MRI findings A) MRI findings of a large sellar and suprasellar solid-cystic macroadenoma; B) Peripheral contrast-enhancement of the solid component on the right. The optic chiasm is cranially displaced and compressed (red arrow). Bilateral anterior cerebral artery (ACA) and anterior communicating artery (ACoA) are also located craniodorsally, but no signs of infiltration exist. On the right, suspicion of infiltration of the cavernous sinus, as we have a solid mass up to the lateral intercarotid line (green arrow); C) The pituitary fossa is enlarged to 25 mm (anteroposterior).

The material removed was examined by a pathologist at London Pathology Service (London, United Kingdom). Histology showed an epithelial neoplasm, arranged in the sheets, papillary and acinar structures, and containing a rich vascular network. The individual tumor cells with round monomorphic nuclei and well-defined amphophilic or eosinophilic nuclei were observed. No mitotic figures were seen and necrosis was absent, as was fibrosis. The appearances as those of pituitary adenoma (Figure 4).



A

B



C

Fig. 3. Post-operative MRI findings after extirpation of pituitary macroadenoma by the transsphenoidal route. A) Solid remnant about 15 x 12 mm near the right ACL extending to the lateral intercarotid line. The suprasellar space, including the optic chiasm, is completely free. The signal from the internal carotid arteries is normal; B) T1 hyperintensity of the neurohypophysis appears parasagittal to the left (red arrow); C) Pituitary fossa remains enlarged in all directions.

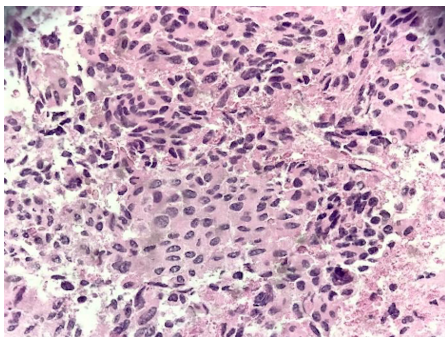


Fig. 4. Sellar region lesion – Pituitary adenoma.

Three months later, the patient returned to our clinic with an improved overall state. Clinically, the patient had multiple improvements in subjective and objective visual acuity and other ophthalmological examinations. We observed an improvement in visual acuity of 20/22 in the right eye and 20/32 in the left eye, with no diplopia or scotomas in the visual field (Figure 5). The pupils reacted well to light in both eyes, and there was no longer an afferent pupillary defect in the left eye. Sub-atrophy of the optic nerve head was still persistent in the left eye in the fundus photograph. The patient was discharged and scheduled for follow-up visits.

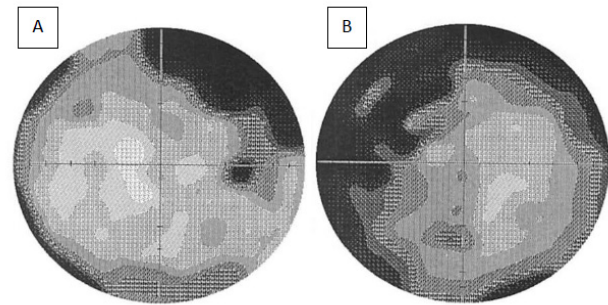


Fig. 5. Visual acuity measured through perimetry postoperatively in the clinic. A) Right eye; B) Left eye

Discussion

There have been studies that discovered different pathologies through visual field defects. Deleu et al. found a Rathke “pouch” cyst in a 71-year-old patient who presented at the ophthalmology department for the first time for a decrease in the temporal visual field of the left eye. Rathke cleft cysts (RCCs) are benign remnants of the Rathke’s pouch, the anlage of the anterior pituitary during embryogenesis. RCCs usually are asymptomatic and are found incidentally, hence the name incidentaloma. RCCs become symptomatic only when they grow massive and compress the optic chiasm. In a case by Deleu et al., 11 days after the operation, the patient described significant improvements in her visual field.⁽⁸⁾

Other rare tumors, such as rhabdomyosarcoma, have been described to be found in the intrasellar region and thus cause bitemporal hemianopsia. Stein et al.⁽⁹⁾ describe a case of embryonal rhabdomyosarcoma in a 34-year-old patient who had been treated for two years for decreased visual acuity and intraocular pressure and, five months before presentation, complained of bitemporal hemianopsia.

Furthermore, Azarpira et al.⁽¹⁰⁾ described a 50-year-old patient who presented with headaches and visual disturbances for two months, and on ophthalmologic examination, bitemporal hemianopsia was detected. The MRI studies showed an intra-sellar mass. Following the initial diagnosis of pituitary adenoma, she was operated on, and histological examination showed a coexisting gangliocytoma with pituitary adenoma and RCC.

Gupta et al.⁽¹¹⁾ presented a case of a pregnant woman with right eye hemianopsia. Her visual acuity on the right eye at 37 weeks was 20/40, and 20/200 two weeks later. She gave birth 2 days afterward and returned for review 2 weeks after giving birth with a visual acuity of 20/30 in the right eye. An MRI conducted a few days later revealed a largely symmetrical pituitary macroadenoma with chiasmal compression. The reason for the change in the visual acuity may be related to the enlargement of the adenoma during pregnancy, but no imaging was obtained before.

Our patient, similar to other cases reported in the literature, was wandering through different clinicians and three months with complaints of headaches and later diplopia. Initially, he was diagnosed with migraine, which did not

respond to therapy. After being surgically treated through endoscopic surgery, a method that has emerged as a first-line of treatment,⁽¹²⁾ his visual field defects and visual acuity got better. Such visual field improvements following endoscopic surgery have been reported in various studies^(13,14) and are consistent with our findings. Even after surgery, minimal defects in the upper temporal fields were still present in our patient. This happened because of the upward compression of the tumor in the optic chiasm.⁽¹³⁾

Conclusion

This case report highlights the importance of performing a thorough ophthalmological examination in patients presenting with headaches and visual disturbances, even if they have already been diagnosed with a neurological condition such as migraine. In this case, perimetry or visual field testing was crucial in detecting visual field defects, which led to further investigations and diagnosis of a sellar mass. Timely diagnosis and intervention, in this case, prevented further complications, and the patient made a good recovery after surgical removal of the mass. This report emphasizes the importance of a multidisciplinary approach in the management of patients with pituitary adenomas, involving ophthalmologists, neurologists, neurosurgeons, and pathologists.

Competing Interests

The authors declare that they have no competing interests.

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