



Uncommon Presentation of Pituitary Macroadenoma: A Case of Hemichiasmal Field Defect

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ABSTRACT:

Background:

Pituitary macroadenomas are benign tumors of the anterior pituitary gland, commonly presenting with visual disturbances due to their proximity to the optic pathways. While bitemporal hemianopia is a well-known manifestation, hemichiasmal field defects are less commonly reported. This case highlights the significance of recognizing such visual field defects as potential early indicators of underlying pituitary pathology.

A 27-year-old male patient presented to the Ophthalmology department with a two-month history of visual field defects. Perimetry was performed, revealing a hemichiasmal field defect. Subsequent magnetic resonance imaging (MRI) was conducted to evaluate the sellar and suprasellar regions for potential compressive lesions. Hormonal assays were also planned to assess for endocrine dysfunction associated with pituitary tumors.

MRI findings demonstrated a well-defined T1/T2 hyperintense lesion in the sellar, suprasellar, and predominantly left parasellar regions, consistent with a pituitary macroadenoma. The visual field defect confirmed the involvement of the optic chiasm, necessitating further evaluation and potential surgical intervention.

Conclusion

This case underscores the importance of recognizing hemichiasmal field defects as significant clinical signs of pituitary macroadenomas. Early diagnosis through comprehensive evaluation and appropriate imaging is crucial for timely intervention, which can significantly improve patient outcomes and prevent irreversible visual impairment. A multidisciplinary approach involving both Ophthalmology and Neurology is essential in managing such cases effectively.

1. Introduction

Pituitary macroadenomas are benign tumours larger than 1 cm that originate from the anterior pituitary gland.

Although rare, with an incidence of 0.1%, due to their proximity to the optic pathways, these tumours often present with visual disturbances, including bitemporal hemianopia, reduced visual acuity, and oculomotor



deficits¹. The mass effect from the tumour can result in headaches and other neurological symptoms, complicating the clinical picture. These include hormonal issues like acromegaly, Cushing's disease, and hypopituitarism. Early diagnosis and proper management are key to preventing neurological deficits and improving outcomes. Diagnosis involves neuroimaging like MRI and CT scans to assess tumour size, location and relationships, with hormone tests¹. Surgery is the main treatment, aiming to decompress structures, relieve symptoms, and address hormonal abnormalities. The minimally invasive endoscopic trans-nasal trans-sphenoidal approach is commonly used due to reduced morbidity compared to traditional surgery.

2. Case report

A 27-year-old male patient presented to Ophthalmology department with complaints of visual field defect persisting for two months. Visual acuity of 6/6 on OD and 6/9 in OS. RAPD positive on OD. Fundus examination revealed temporal pallor in OD. Fellow eye was normal. Upon conducting perimetry, a hemichiasmal field defect (figure 1) was identified, indicating potential involvement of the optic chiasm. Blood investigations for hormonal assay were within normal range. Magnetic resonance imaging (MRI) of brain and orbit revealed a well-defined T1/T2 hyperintense lesion involving the sellar, suprasellar and parasellar regions with extensions predominantly into the left parasellar region. Lesion shows few cystic spaces and extensive blooming on GRE image lesion shows few areas of diffusion restriction within and extensions suggestive of pituitary macroadenoma (figure 2). Transphenoidal resection of pituitary macroadenoma was planned.

3. Discussion

Pituitary adenomas account for approximately 12 % of clinically symptomatic intracranial tumours. They are classified into two categories based on their size, microadenoma (less than 1 cm) and macroadenomas (greater than 1 cm). Lower nasal fibers, traverse the chiasma low and anteriorly, most vulnerable to damage from expanding pituitary lesion, affecting upper temporal quadrant visual field. Upper nasal fibers cross high and posteriorly in chiasma which affect lower temporal quadrant of visual field (e.g. Craniopharyngioma). Contralateral hemichiasmal

scotoma with ipsilateral monocular vision loss signify posterior chiasmal and optic tract involvement. Lesion of optic tract may produce optic atrophy as optic tract are axons of retinal ganglion cells. In this case, the patient's symptoms align with this understanding, as the bitemporal field defect developed gradually over two months.

The identification of any field defect necessitates a thorough clinical evaluation, including neuroimaging studies such as MRI. MRI is the gold standard for visualizing pituitary tumours and other potential compressive lesions. It allows for detailed assessment of the tumour's size, location, and its relationship to surrounding structures, including the optic chiasm and other critical neuroanatomy¹.

In addition to imaging, it is essential to perform hormonal assays to evaluate for any endocrine abnormalities that may accompany pituitary macroadenomas. Common hormonal disturbances include hyperprolactinemia, growth hormone excess, and Cushing's disease. The presence of these abnormalities can guide management and surgical planning.

Management of pituitary macroadenomas typically involves surgical intervention, particularly when there is significant mass effect leading to visual disturbances or when there is evidence of hormonal hypersecretion². The trans sphenoidal approach is the most common surgical technique used to remove these tumours, as it provides direct access to the pituitary gland while minimizing morbidity associated with craniotomy³. In this case, if imaging confirms the presence of a pituitary macroadenoma, surgical resection would be indicated to alleviate pressure on the optic chiasm and restore visual function.

Postoperative follow-up would include monitoring visual fields and hormonal levels to assess for any recurrence or residual tumor⁴. This case underscores the importance of recognizing bitemporal hemianopia as a potential indicator of a pituitary macroadenoma or other compressive lesions affecting the optic chiasm⁵. Early diagnosis through comprehensive clinical evaluation and appropriate imaging is crucial for timely intervention, which can significantly improve patient outcomes and prevent irreversible visual impairment^{6,7,8,9}.



4. Conclusion

This hemichiasmal field defect presentation is possible in chiasmal syndrome. Schiefer and co-worker's reported in the same way that the majority of chiasmal lesions were caused by pituitary adenoma (65%), followed by craniopharyngioma (12%), astrocytoma (10%) and meningiomas (8%) that causes extrinsic compression of optic chiasma¹⁰. Extent of visual field loss is associated with the tumour's volume and its direction of displacement. Early diagnosis and prompt referral to the Neurology department are crucial for ensuring timely intervention and preventing irreversible visual impairment. Ophthalmologists play a vital role in recognizing bitemporal hemianopia and other visual field defects, which can serve as the first indication of a pituitary macroadenoma

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