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Short Communication

Intermittent Colour Vision Changes Secondary to Pituitary Macroadenoma

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ABSTRACT

Pituitary adenomas are the most common benign tumours of the sellar region. They represent 10%-15% of all intracranial neoplasms. Macroadenomas are tumours exceeding 10 mm in diameter. They carry a significant morbidity and sometimes mortality risk if not treated in a timely manner, usually by surgical extirpation. Manifestations of tumours that arise from a pituitary gland are diverse. Patients with macroadenomas may be asymptomatic or may present with hormonal imbalance or mass effects. Hormone secreting tumours can give rise to hyperthyroidism, Cushing syndrome or hyperprolactinemia. The mass effect can manifest as headaches, visual deficits, or sudden intracranial haemorrhage. Visual deficits result from chiasmal compression that leads to bitemporal hemianopia or complete vision loss from optic nerve compression. Pituitary apoplexy, which results from infarction or intra-pituitary haemorrhage is a medical emergency, which can lead to a sudden onset of headache, collapse, shock and death. Significant morbidity is also associated with treatment of these tumours. The case below illustrates how intermittent colour vision changes can lead to detection of optic chiasmal compression by a pituitary macroadenoma and how they resolve after the surgery.

Keywords: Quadrantanopia; Macroadenoma; Stereotactic trans-sphenoidal resection; Vision

DESCRIPTION

A 49 years old male with a history of red-green colour blindness noticed sudden colour vision changes. The white colour paint appeared pink to him and the black colour looked purple during house renovations. He did not suffer from headaches or blurry vision. He was not on any regular medications.

His best corrected visual acuity (BCVA) was 6/6 in the right eye and 6/5 in the left eye. His pupils were equal and reactive. He had normal ocular motility. The Ishihara colour vision test was 1/17 in both eyes. Fundoscopy and OCT showed normal optic nerves and maculae (Figure 1). The Humphrey visual field test revealed bitemporal superior incomplete quadrantanopia, indicating a possible pituitary lesion (Figure 2). He was referred for an MRI scan with gadolinium which revealed a 20 mm in diameter macroadenoma (Figure 3). Subsequent blood tests showed a mild hormonal imbalance with decreased testosterone levels.

One week after his presentation he was scheduled for stereotactic trans-sphenoidal resection of the tumour and underwent surgery. He recovered well with no neurologic deficits and remained asymptomatic. His colour vision changes resolved. The follow-up eye examination, at six months, revealed normal visual acuity 6/5 in both eyes, no changes on fundoscopy, or OCT scan. The Humphrey visual field test showed minimal and nonspecific peripheral field changes and a resolution of his bitemporal superior quadrantanopia (Figure 4).

A common presentation of pituitary macroadenoma is vision loss in one eye or a visual field defect, which may not recover after the surgery and leaves the patient with a permanent visual impairment [1]. Tumours of the pituitary gland produce a triad of neuro-ophthalmic signs, early loss of vision, deficits in the visual field and optic atrophy [2].

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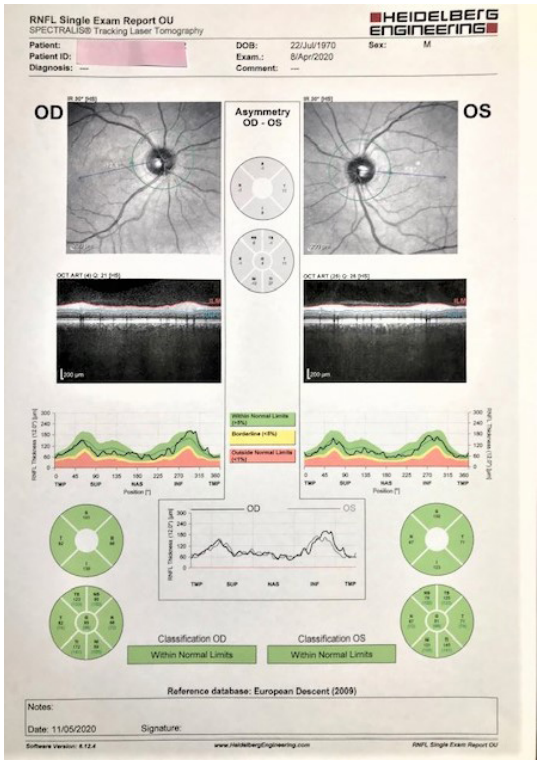

Figure 1: Normal OCT at presentation.

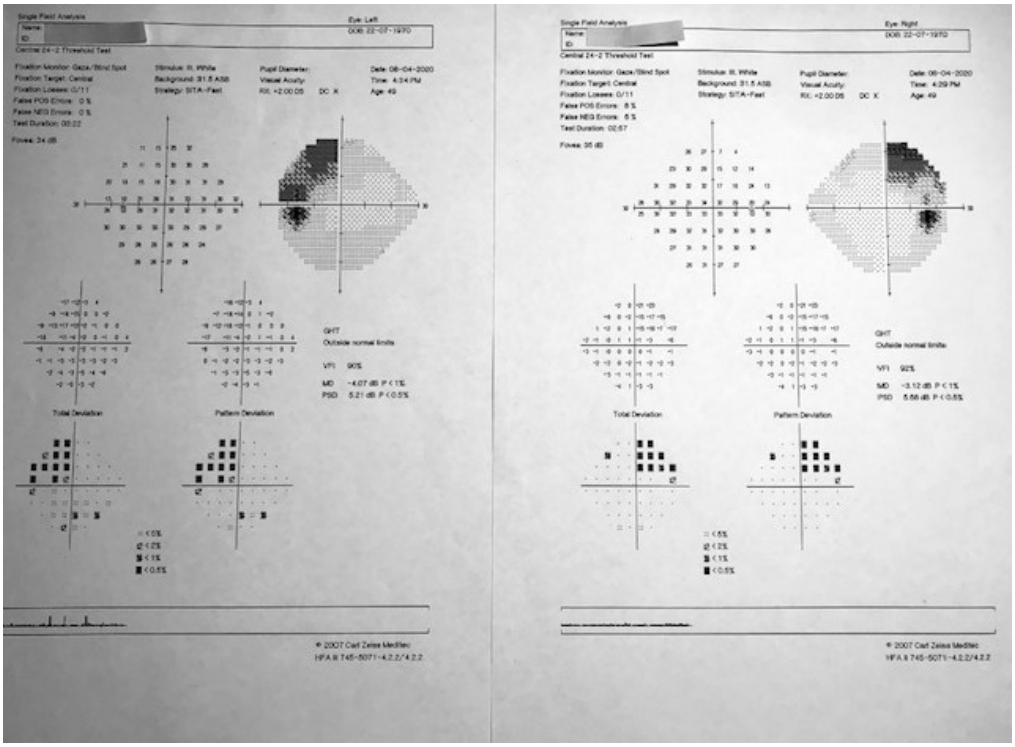

Figure 2: Bitemporal superior incomplete quadrantanopia.

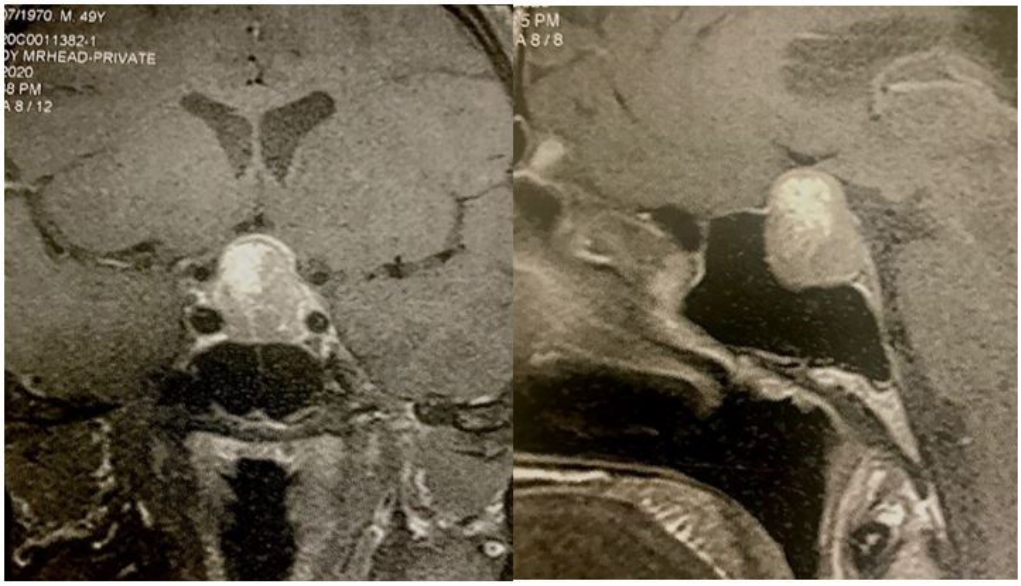

Figure 3: MRI scan showing pituitary macroadenoma, compressing optic chiasma.

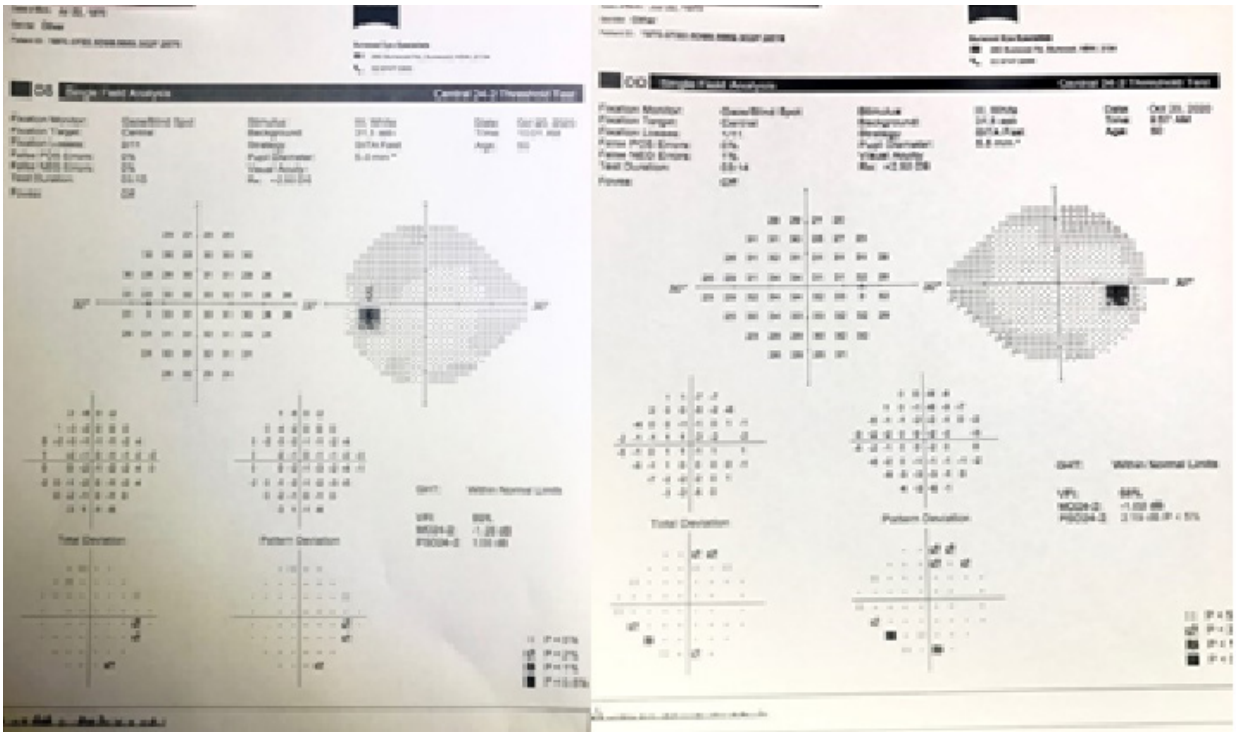

Figure 4: Postoperative resolution of bitemporal superior incomplete quadrantanopia.

The size of the tumour and its position in relation to optic chiasm influence the degree of visual impairment, which also effects post-surgical visual prognosis [3]. Larger tumours which expend and grow upwards cause inferior chiasmal nerve fibre compression and superior bitemporal quadrantanopia [4]. The visual field defect becomes a complete bitemporal hemianopia with a longer duration of chiasmal compression. More anterior tumour extension leads to optic nerve compression, optic nerve atrophy and decreased vision.

Early diagnosis of pituitary adenoma is essential to prevent longstanding chiasmal compression, which often leads to optic nerve atrophy from retrograde axonal degeneration. Studies showed that colour contrast sensitivity, using a Farnsworth-Munsell 100 hue test, is decreased in patients with pituitary tumours. Gupta et al interpreted the alterations of colour contrast sensitivity in patients with hypophyseal adenoma as defects in the myelination of the visual fibres [5].

DISCUSSION AND CONCLUSION

This case illustrates how early detection of the pituitary macroadenoma can preserve vision of patients with pituitary tumours. The symptoms of colour vision changes can have daily fluctuations and can be easily missed. The ophthalmologist's role is to elicit these subtle symptoms from patient's history, perform a detailed and systematic eye examination, including visual field testing and refer for neuroimaging and to a neurosurgical team urgently.

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