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Case Report

THE IMPORTANCE OF OPHTHALMIC SIGNS IN THE DIAGNOSIS OF SUPRASELLAR MENINGIOMA – A CASE REPORT

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ABSTRACT
A forty-two year old lady presented with gradual, painless, progressive blurring of vision of her left eye for four months. There were no other associated ocular or systemic complaints. Examination showed decreased visual acuity in both eyes and a pale optic disc on the left side. Visual field examination revealed a temporal field defect of the right eye which aroused the suspicion of an intracranial mass lesion. MRI of her brain revealed a suprasellar meningioma. We would like to emphasize the importance of visual field examination of both eyes in patients presenting with unilateral loss of vision.
Keywords: Unilateral visual loss, visual field defects, suprasellar meningioma, chiasmal lesion.
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INTRODUCTION

Loss of vision is a common ophthalmic complain. In cases of unilateral visual loss, binocular involvement is often not appreciated until the patient is examined.[1] Clinical clues such as relative afferent papillary defect (RAPD), asymmetrical cup-disc ratio (CDR), the colour of neuroretinal rim and the pattern of visual field defects are very helpful in localizing an intracranial lesion. This case report illustrates the importance of such clinical clues which guided the clinicians to the diagnosis of a suprasellar meningioma.

CASE REPORT

A 42 year old lady presented with four months' history of gradual loss of vision of her left eye. The loss of vision was slowly progressive and she described it as a generalized dimming of vision. Otherwise, there was no precipitating, aggravating or relieving factor. There was also no history of trauma, headache, ocular pain, eye redness or lacrimation. She reported vision of her right eye as normal. There were no neurological or endocrine symptoms. There were no significant past ophthalmic, medical, surgical and drug history.

On examination, her higher mental functions were normal. There were no neurological deficits. The visual acuity (VA) of her left eye was counting finger (CF) at 1 meter which was not improved with pinhole. The refraction of her left eye was +1.0 DS / -0.5 DC x 075 with the best corrected visual acuity (BCVA) of CF. Her right eye's BCVA was 6/18. Confrontation visual field was not possible for her left eye due to poor VA, but she reported that the penlight at the temporal visual field appear dimmer than the nasal field. Confrontation visual field test of her right eye showed unsuspected visual field defects in the temporal hemifield and infero-nasal quadrant. The intraocular pressures (IOP) were 16 mm Hg (left eye) and 18 mm Hg (right eye). Pupils were 3 mm bilaterally and equally reactive to light. Relative afferent pupillary defect (RAPD) was positive for her left eye. Ocular motility was normal and there was no pain during eye movement.

Anterior segment of both eyes were normal. Fundus examination showed a pale optic disc on the left side compared to the right (Figure 1). There was asymmetry of the cup-disc ratio (CDR) in the vertical axis; the vertical CDR of her left eye was 0.4 while the vertical CDR of her right eye was 0.1. Otherwise, the disc margins were distinct bilaterally. Spontaneous venous pulsations were present bilaterally. The retinal fields and macula were normal bilaterally.

A computed perimetry was performed for her right eye with the Humphrey Field Analyzer (Figure 2). The differential light sensitivity (DLS) of her right fovea was 24 dB. The expected foveal sensitivity for her age was 33 dB. Thus the foveal sensitivity was markedly reduced. Total deviation print out

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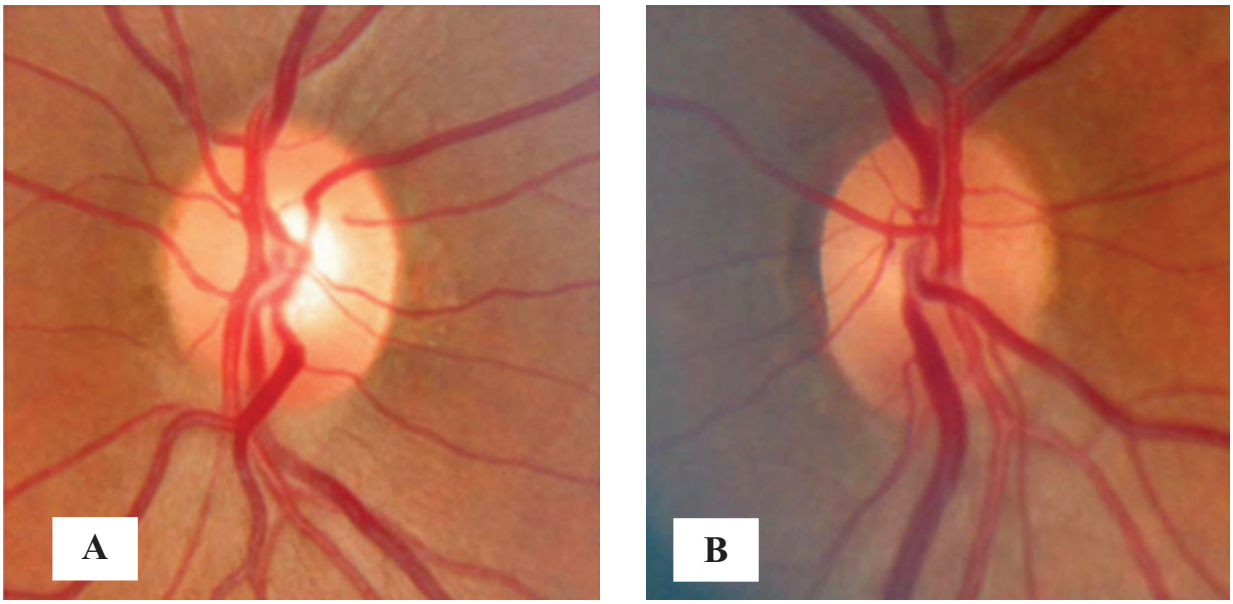

Figure 1. Color fundus photograph. Figure 1A: Left optic disc showing increased vertical cup-disc ratio and slightly pale neuroretinal rim. Figure 1B: Right optic disc (normal)

showed generalized visual field depression. Pattern deviation print out revealed that the visual field defect was more marked in the temporal hemifield and inferior nasal quadrant. The visual field depression respected the vertical midline. Computer perimetry was not possible for her left eye due to poor VA.

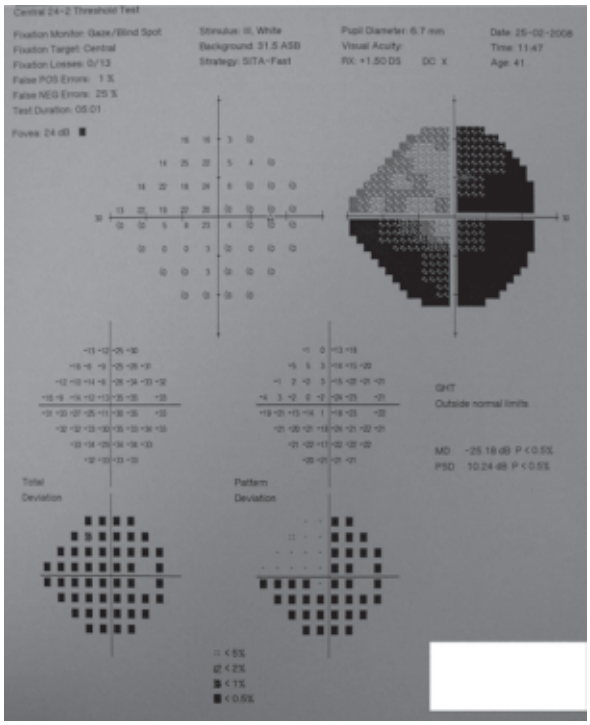

Figure 2. Humphrey single field analysis of patient's right eye. The foveal threshold was depressed (24dB). Pattern deviation revealed visual field defect that respected the vertical midline.

In summary, this 42 year old lady presented with painless binocular visual loss, which developed gradually over a period of four month. This was associated with differences in optic disc colour, asymmetry in CDR of more than 0.2 and visual field defect which respected the vertical midline. A huge chiasmal lesion was strongly suspected. Computer tomography (CT) of the brain (axial view) showed a homogenous hyperdense globular mass at the parasellar region. The mass enhanced homogenously with intravenous contrast agent (Figure 3). Coronal view showed no sphenoid bone erosion, instead there was hyperostosis of the sphenoid bone (Figure 4).

Magnetic Resonance Imaging (MRI) of the brain showed a nodular tumour arising from the middle part of the middle cranial fossa. The mass enhance homogenously with intravenous gadolinium. It extended into the suprasellar cistern compressing the optic chiasm, hypothalamus and pituitary gland. There was a tail of meningeal enhancement extended onto the cribriform plate (Figure 5). The tail of meningeal enhancement was typical of meningioma. Hence, the patient was diagnosed of having a suprasellar meningioma. The patient was subsequently referred to the neurosurgical team for further management.

DISCUSSION

Meningiomas are derived from arachnoid cells that are commonly associated with arachnoid villi at dural venous sinuses and their tributaries, cranial nerve foramina, cribriform plate and medial middle cranial fossa.[2] The mean frequency

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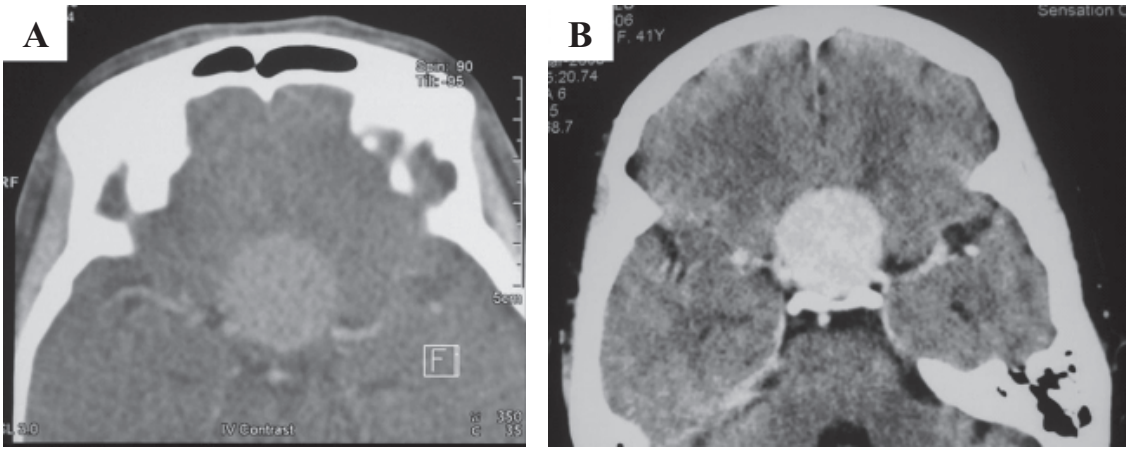

Figure 3. CT brain, axial view. Figure 3A: Plain CT brain revealed a homogenous hyperdense globular mass at the parasellar region. Figure 3B: The mass enhanced homogenously with intravenous contrast agents.

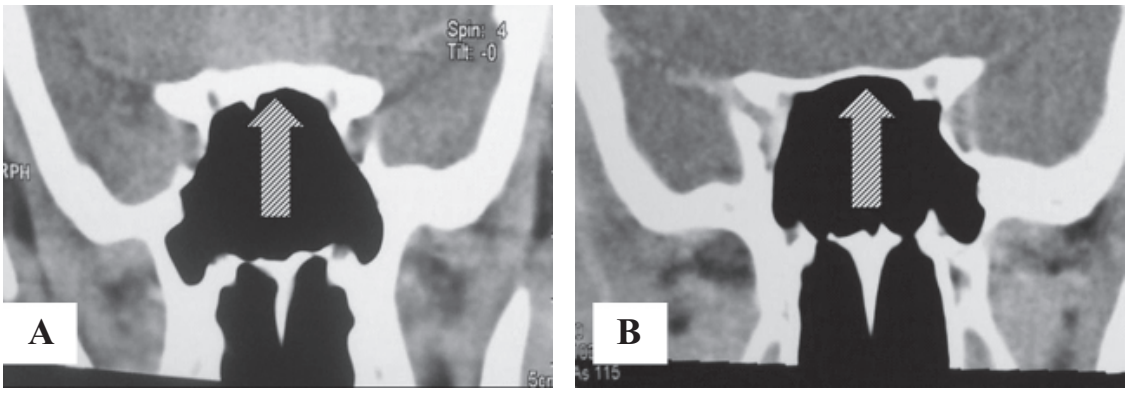

Figure 4. CT brain, coronal view. Figure 4A: CT brain of the patient showing hyperostosis of the sphenoid bony. Figure 4B: CT brain of another patient showing normal sphenoid bone thickness.

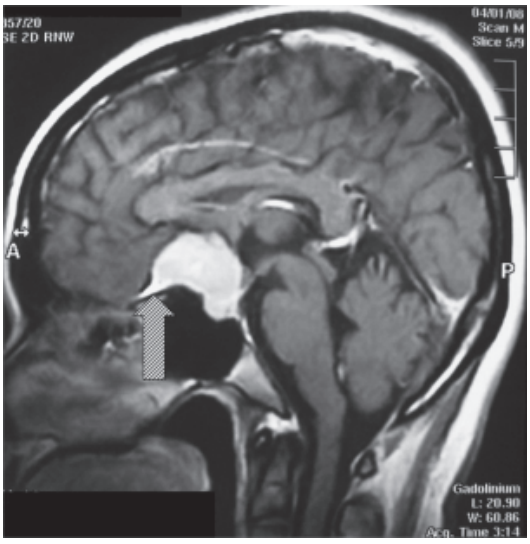

Figure 5. MRI brain with intravenous gadolinium enhancement showed a nodular tumour with a tail of meningeal enhancement (arrow) extended onto the cribriform plate.

of meningiomas among primary intracranial neoplasm is approximately 20%.[3] This is comparable with our local data in which 22.1% of central nervous system (CNS) neoplasm was of meningothelial origin.[4] Meningioma is also the commonest intracranial tumour operated in the neurosurgery service in Sarawak, Malaysia. [5] The ratio of male to female incidences range from 1 : 1.4 to 1 : 2.8.[3]

The commonest site for intracranial meningiomas is the parasagittal area. Suprasellar meningiomas constitute about 9% of all intracranial meningiomas.[3] Most suprasellar meningiomas arise from the dura of the tuberculum sellae. They rarely arise from the diaphragma sellae.[6]

Meningiomas are slow growing and generally become clinically evident in midlife.[2] Depending on the location of the tumour, patients with meningiomas may be asymptomatic, may complain of general symptoms like headache or may develop localizing signs. The commonest symptom in our local setting is headache. This non-specific symptom resulted in delayed diagnosis; average 25 months and 7 clinic visits.[5]

This patient presented with painless binocular visual loss, which developed gradually over a period of four month. Confrontation visual field test is a simple but very important office procedure which is frequently overlooked by some practitioners. The afferent visual pathway is very well organized and has been well described. The arrangement of the axons in the afferent visual pathway produces characteristic visual field deficit which allow accurate localization of intracranial pathologies. The nasal retinal nerve fibres (which carry information from the temporal visual field) decussate at the optic chiasm. Hence chiasmal lesions will produce bilateral visual field loss. The patient reported no visual problem with her right eye because her central vision was relatively preserved. However, we discovered unsuspected visual field defect. This had led to formal visual field assessment with the Humphrey Field Analyzer. The feature which was most suggestive of an intracranial space occupying lesion was the presence of visual field defect that respected the vertical midline.

Contrast enhanced MRI provides the highest level of detection of meningiomas. Meningiomas enhance intensely and homogenously with intravenous paramagnetic contrast material. Contrast enhancement of the dura extending away from the margins of the mass is typical of meningioma. This dural tail could either due to meningeal reaction or tumour invasion. Its resection is important to lessen the risk of recurrence.[7] The tumour was centrally located, but the force exerted on the optic chiasm may not be distributed evenly. This probably explains the asymmetrical visual field involvement.

This case highlighted a few important clinical points. In cases of unilateral visual loss, binocular involvement is often not appreciated until the patient is examined.[1] If a patient comes in with poor vision in the *one* eye, it is important to perform visual field examination for *both* eyes. There may be unsuspected visual field loss indicating an intracranial lesion.

The afferent visual pathway is very well organized and has been well described. The arrangement of the axons in the afferent visual pathway produces characteristic visual field deficit. An intracranial space occupying lesion should always be rule out in cases of visual field losses that respect the vertical midline.

Relative afferent pupillary defect (RAPD) is an extremely useful clinical sign. Pupils of both eyes respond equally to light stimulation to either eye due to the presence of direct and consensual light reflex pathway. When performing the swinging fiashlight test, a penlight is alternately switched from one eye to the other and back. This stimulates each eye in rapid succession. RAPD is negative when both pupils remain constricted when the penlight is swing from one eye to the other. RAPD is positive when stimulation of one eye results in brisk pupil constriction of both eyes whereas stimulation of the other eye causes paradoxical dilatation of both pupils. The presence of RAPD indicates unilateral optic nerve dysfunction or asymmetrical bilateral optic nerve dysfunction. Visual losses without RAPD occur in cases of unilateral retrochiasmal lesion or bilateral symmetrical optic nerve lesion.[8]

Lastly, optic nerve head assessment provides valuable clinical clues. Comparison between the two eyes of the same patient provides important information during optic disc examination. Vertical CDR asymmetry of more than 0.2 should be considered pathological until proven otherwise.[9]

In conclusion, detail knowledge of clinical neuroanatomy offer rewarding clinical clues which would otherwise be missed. The correlation between ophthalmic signs and clinical localization of intracranial lesions is the basis of neuro-ophthalmology. Confrontation visual field test and swinging flashlight test for the detection of RAPD are simple, quick and very informative office procedures. These are especially helpful for family physicians that are in the front line of patient care.

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