OPHTHALMIC MANIFESTATIONS AND VISUAL FIELD CHANGES WITH SELLAR AND SUPRASELLAR TUMOURS

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ABSTRACT: PURPOSE: To evaluate ocular manifestations and visual field changes in patients with Sellar and Suprasellar Tumours. METHODS: Fifty patients with Sellar and Suprasellar tumours underwent a complete ophthalmic assessment and visual field analysis using the Humphrey Field Analyzer 30-2 program. Visual acuity, duration of symptoms, optic nerve head changes, pattern of visual field defects was noted. RESULTS: 50 patients including 15 male and 35 female subjects with mean age of 35.1±9.9 years and CT/MRI proven Suprasellar tumours 70% pituitary adenoma and 30% craniopharyngiomas were included. 70% cases presented with headache 80% with diminution of vision only 10% with hypothyroidism 50% with abnormal pupillary reaction including RAPD and anisocoria. Mean visual acuity at presentation was 0.46 log MAR. Of 100 eyes, 45 patients (90%) had visual field defects including temporal defects in 35 patients (70%), non-specific defects in 4 patients (20%) and 1 patient (10%) without any defect. Optic nerve head changes noted and 5 patients (25%) presented with partial optic atrophy and 10 presented with established papilloedema. Visual field outcomes are correlated with duration of symptoms, optic nerve head changes at presentation and CT/ MRI findings. CONCLUSION: Visual field defects were present in two thirds of patients at presentation. An overall deterioration in vision and visual fields was noted before surgical resection. A correlation was found between the duration of symptoms, MRI/ CT scan reports and visual field, signifying the importance in early diagnosis of neurological lesions on the basis of ophthalmic examination.

KEYWORDS: Suprasellar tumour; Visual Field; Bitemporal hemianopia; Pituitary adenomas; craniopharyngioma; Meningiomas.

INTRODUCTION: Sellar and Suprasellar tumours comprise 25% of tumours in the chiasmal region. Three most common tumours are Pituitary tumour (25%), Meningiomas (10%) Craniopharyngiomas (15%), Gliomas

A spectrum of visual manifestations has been reported with these tumors, ranging from the presence of any visual symptoms to severe visual field defects and loss of vision. The most common visual field defect is bitemporal hemianopia. However, other types of visual field deficits may also be observed. The current study was undertaken to study the ocular manifestations in patients with sellar and suprasellar tumours at a single institute over a one-year period.
Ocular manifestations include:\(^1\)
- Blurred vision.
- Visual field defects.
- Loss of colour vision.
- Optic disc atrophy or papilloedema.
- Knowledge of the more common tumors will assist the ophthalmologist in deciding which patients should be followed up and which require referral to neurosurgeons or radiation oncologists.

**Primary Objective:** To study the ocular manifestations of Sellar and Suprasellar tumours.

**Secondary Objective:** To study the visual field defects caused by Sellar and Suprasellar tumours.

All the patients attending Neurosurgery and Ophthalmology OPD diagnosed with Sellar and Suprasellar tumours clinically and on investigation basis

**Study Design:** a cross sectional study.

**Selection Criteria:**

**Inclusion Criteria:** Patients with CT or MRI proved sellar and suprasellar tumours.
Exclusion Criteria:
- Rapidly deteriorating general health conditions.
- Marked behavioral disorders.
- Uncooperative patients.

MATERIALS AND METHODS: 50 patients with suprasellar tumours were included during a period of 1yr.
- Detailed history.
- Visual acuity with Green's chart.
- Colour vision.
- Extraocular movements.
- Anterior segment examination using the slit lamp.
- Fundi examination with direct and indirect ophthalmoscope.

Visual Field Protocol: They underwent standard perimetry using the central 30-2 program on the Humphrey Field Analyzer with Goldmann size III target was performed in all subjects. Reliability criteria were fixation loss less than 20%, with false positive and false negative errors less than 33%. Changes in visual fields were analyzed separately for the right and left eyes in all 50 patients (100 eyes). Mean deviation (in dB) was used to compare overall visual field changes using paired t-test. Categorical variables (patient age and duration of visual symptoms) were analyzed as potential predictive factors for recovery of visual field defects.

Clinical and visual field findings were then correlated with any lesions seen on CT and MRI examination.

RESULTS:
- 50 patients (15 male, 35 female) subjects with mean age of 35.1±9.9 years.
- Duration of symptoms between 15 days and 2yrs.
- 80% cases presented with headache.
- 70% with diminution of vision.
- 50% with abnormal pupillary reaction including RAPD and anisocoria.
- 18% of cases had good visual acuity from 6/6 to 6/12.
- 74% with visual acuity between 6/18 to 6/36.
- 10% cases were counting finger 1 metre or less.

Of 50 patients, 45 (90%) had visual field defects including:
- Bitemporal hemianopia in 30 patients (60%),
- Bitemporal quadrantanopia in 10 patients (20%).
- Homonymous hemianopia in 5 patients (10%).
- Constriction of visual fields in 2 patients (4%).
- 2 patients (4%) with visual fields with normal limits.

VI cranial nerve palsy (60%) was commonly found in patients followed by VII cranial nerve palsy (20%).
- 5% cases had III cranial nerve palsy.
- 6 cases had pupillary defects.

2 Optic nerve head changes noted:
- 5 patients (10%) presented with partial optic atrophy.
- 10 patients (20%) presented with papilloedema
- Visual field outcomes are correlated with duration of symptoms, optic nerve head changes and the site of tumour at presentation and CT/ MRI findings.

Case of Pituitary Macroadenoma presented with Bitemporal Hemianopia:

Figure 1
DISCUSSION: Sellar and Suprasellar tumors, originate from the optic chiasma, tuberculum sellae, planum sphenoidale, and diaphragma sellae, affect visual acuity and the visual fields. Suprasellar tumors are relatively benign, slow growing neoplasms (WHO grade I tumors). They account for 25% of primary brain tumors and can occur anywhere along the infundibulum (from the floor of the third ventricle to the pituitary gland). With the use of CT and later MR imaging, visual symptoms in our patients were present for an average of more than 1 years before diagnosis. Two patients had a fluctuating or rapidly progressing visual loss. Anatomic relationships suggest that tumor extension 10mm above the diaphragm sellae is necessary for the anterior visual pathway to become compressed. It is interesting to note that patients with pituitary adenoma exhibited a significant reduction in the subscale of “ocular pain.” Enlargement of the pituitary adenoma mass may lead to compression of the diaphragm sellae (innervated by the first branch of the trigeminal nerve), resulting in ocular pain and frontal headache. Visual loss has been reported as the most frequent symptom, accounting for 76 to 99 percent of patients.4

Figure 2

Figure 3
In the present study, headache followed by visual loss, either monocular or binocular, was the most common ocular manifestation (70%). Defective colour vision was noted in 4 patients. Bitemporal hemianopia has been considered the hallmark of pituitary tumors due to chiasmal compression from below.\textsuperscript{1} It was also the most commonly encountered field defect in the present study.

Truly atypical visual field defects encountered in the present study were peripheral constrictions and arcuate scotomas present in 6 patients. Homonymous hemianopia, superotemporal quadrant defects were noted. Similarly, Trautman et al noted visual fields were affected more frequently than visual acuity.\textsuperscript{4} Based on the present findings, the important parameters in the evaluation of patients diagnosed with suprasellar tumors were Age, duration of symptoms, preoperative visual loss and type of tumor. Although visual loss was the most common ocular manifestation, any patient with loss of vision, diplopia, or ptosis should be carefully examined for evidence of Suprasellar Ocular manifestations occur very frequently in sellar and suprasellar tumours, which in some cases helps us to diagnose the condition earlier. Pituitary adenoma was the most frequent sellar tumor. Headache is the most common symptom followed by defective vision. Papilloedema is the most common ocular fundus finding. Visual field abnormality is seen in majority of cases out of which bitemporal hemianopia is most common presentation.

2 patients previously diagnosed with glaucoma on visual field examination presented with bitemporal defects which signifies that field changes in neurological lesions have overruled glaucomatous field changes.

CONCLUSION: There is a need for increasing awareness among the ophthalmic community and other physicians for timely referral of these patients and prompt neurosurgical intervention.

Visual field defects were present in two thirds of patients at presentation. An overall deterioration in vision and visual fields was noted before surgical resection. A correlation was found between the duration of symptoms, MRI/ CT scan reports and visual field, signifying the importance of early diagnosis of neurological lesions on the basis of ophthalmic examination.

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