Ocular Manifestations of Suprasellar Tumors

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Objective: *To determine ocular manifestations of suprasellar tumors and to identify the pre-operative factors that might influence final visual outcomes.*
Material and Method: *Medical records of 69 patients with a diagnosis of suprasellar tumor at Srinagarind Hospital between January 1995 and December 2005 were retrospectively reviewed.*
Results: *The present study focused on 69 patients (39% men and 61% women) with averaged 37.74 years of age (range, 6 to 75). The duration of symptoms was between 4 days and 5 years (average, 7.7 months). The ocular manifestations included visual loss in 59 (86%), eye pain in six (9%), diplopia in three (4%), and ptosis in one (1%) patient. The respective definite diagnosis were pituitary adenoma, suprasellar meningioma, and craniopharyngioma in 33 (48%), 19 (28%), and 17 (25%) patients. According to the pre-operative visual acuity in the worse eye, seven (10%), seven (10%), and 55 (80%) patients were stratified to Group I (VA 6/5 to 6/12), Group II (VA 6/18 to 6/36), and Group III (VA 6/60 to no vision), respectively. Post-operatively, two (29%) patients in Group II and 14 (25%) in Group III had improved visual acuity. Three groups of visual field defect were revealed, viz., Group A (normal visual field), Group B (typical field defect) and Group C (atypical field defect) in seven (10%), 49 (71%), and 13 (19%) patients, respectively. Positive relative afferent pupillary defect was detected in 31 patients (45%) and optic disc atrophy was detected in 26 patients (38%).*
Conclusion: *Pituitary adenoma was the most frequent suprasellar tumor and visual loss was the most common ocular presentation. Bitemporal hemianopia frequently occurred in these patients, but was usually asymmetrical and unpredictable in its evolution.*

Keywords: *Craniopharyngioma, Meningioma, Ocular manifestation, Pituitary tumor, Suprasellar tumor*

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Suprasellar tumors comprise 25% of tumors in the chiasmal region. The three most common tumors are pituitary tumor (50%), craniopharyngioma (25%), and meningioma (10%)[1]. Ocular manifestations including blurred vision, visual field defect, loss of color vision and optic disc atrophy are usually insidious but progressive[2,3]. Pituitary apoplexy, however, can cause sudden visual loss and ophthalmoplegia[4].

A retrospective analysis of ocular manifestations was undertaken in 69 patients diagnosed with suprasellar tumors.

Material and Method

The present retrospective study included 69 patients diagnosed with primary suprasellar tumors and operated transcranially or transphenoidally at Srinagarind Hospital between January 1995 and December 2005. The optic nerve and chiasm were not intra-operatively injured.

Medical records of each patient were reviewed vis-□-vis histories and physical examinations including pre- and at the eighth week post-operative evaluations of neuro-ophthalmic, neurologic and endocrinal status. Neuro-ophthalmic examinations including visual acuity with snellen chart, anterior segment, funduscopy, and Goldmann visual field were performed in all patients by ophthalmologists. Computerized tomography perimetry was performed in only suspicious cases. Diagnosis were confirmed by tissue pathology. The patients were then classified based on the duration of visual disturbances into five groups, each group being twelve months in duration. The visual outcomes, including

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visual acuity and visual field were determined by ophthalmologists.

According the pre-operative visual acuity in the worse eye, patients were divided into three groups; Group I with a visual acuity of 6/5 to 6/12, group II with a visual acuity of 6/18 to 6/36, and group III with a visual acuity of 6/60 to no vision.

Regarding pre-operative visual field defects, all patients were divided into three groups: group A with a normal visual field, group B with typical visual field defects, and group C with atypical visual field defect (i.e., defined as a defect that did not correspond to any characteristic visual field defect). Patients in group B were further subdivided into: (i) unilateral or bilateral quadrantanopia; (ii) unilateral and bilateral hemianopia; and, (iii) three or more quadrants of unilateral or bilateral visual field loss. Data were analyzed by range, mean, standard deviation (SD), and frequency with percentage.

Results

Sixty-nine patients (27 males, 42 females) ranging between 6 and 75 years of age (37.74 $\pm$ 47.36) were studied. The majority of patients (34/69) were between 31 and 45 years of age (Fig. 1). The duration of symptoms varied between 4 days and 5 years (7.70 $\pm$ 15.17 months). None of them had a hormonal disturbance.

Most of the patients (62/69) reported their symptoms within twelve months (Table 1). Patients with a longer duration of symptoms had less recovery of vision. Visual loss, ocular pain, diplopia, and ptosis were the ocular manifestations in 59 (86%), six (9%), three (4%), and one (1%) patients, respectively (Fig. 2). The final diagnosis included 33 pituitary adenomas (48%), 19 suprasellar meningiomas (28%), and 17 craniopharyngiomas (25%).

According to the pre-operative visual acuity in the worse eye, 7 (10%), 7 (10%) and 55 (80%) patients were classified into group I, II, and III, respectively.

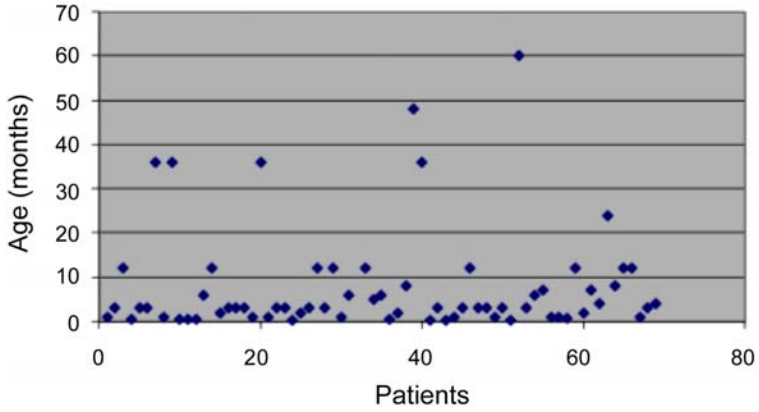

Fig. 1 Distribution of age (n = 69)

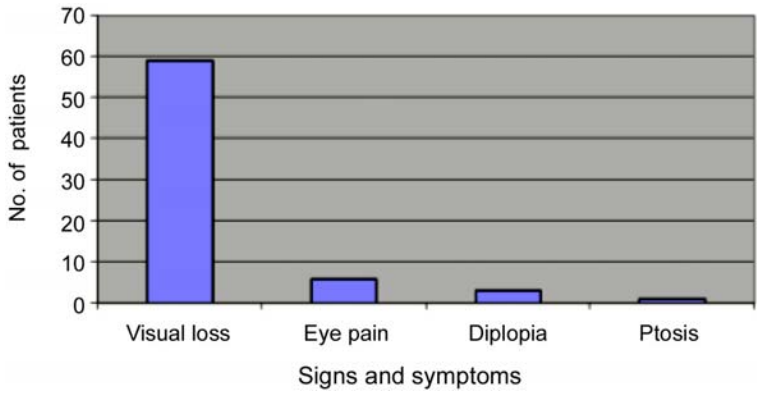

Fig. 2 Ocular manifestations of suprasellar tumors (n = 69)

Post-operatively, improvement in visual acuity occurred in 29% of group II and 25% of group III. Twenty-two patients experienced deterioration in their post-operative vision, three and 19 patients from group I and group III, respectively (Table 2).

Seven (10%) patients in group A had a normal visual field, compared to 49 (71%) and 13 (19%) in groups B and C, respectively. Bi-temporal hemianopia (49%) was the most commonly encountered field defect, while 10 (14%) had quadrantanopia and five (7%) a 3 or greater quadrant loss of visual field (Table 3). Other ocular manifestations were positive relative afferent papillary defect in 31, optic nerve atrophy in 26, and ptosis in one patient.

Discussion

Suprasellar tumors, which originate from the tuberculum sellae, planum sphenoidale, and diaphragma sellae, can affect visual acuity and the visual field[5-10]. Visual loss has been reported as the most frequent symptom, accounting for 76 to 99 percent of patients[5,11-13]. In the present study, visual loss, either monocular or binocular, was the most common ocular manifestation (86%).

Table 1. Duration of symptoms and post-operative visual acuity (n = 69)

Duration (months)	Total number	Post-operative visual acuity					
		Improved		Stable		Deteriorated	
		No.	%	No.	%	No.	%
0-12	62	13	20.97	27	43.55	22	35.48
13-24	1	1	100.00	-		-	
25-36	4	1	25.00	1	25.00	2	50.00
37-48	1	-	-	1	100.00		
49-60	1	-	-	1	100.00		

Table 2. Pre-operative and post-operative visual acuity (n = 69)

Pre-operative visual acuity	Total number	Post-operative visual acuity					
		Improved		Stable		Deteriorated	
		No.	%	No.	%	No.	%
6/5-6/12	7	-	-	4	57.14	3	42.86
6/18-6/36	7	2	28.57	5	71.43	-	-
6/60-No LP	55	14	25.45	22	40.00	19	34.55

Table 3. Pre-operative visual fields

Visual field	Pre-operative visual field	
	No.	%
Group A (normal VF)	7	10.14
Group B		
i) quadrantanopia, unilateral or bilateral	10	14.49
ii) hemianopia, unilateral or bilateral	34	49.28
iii) three quadrant or more field loss, unilateral or bilateral	5	7.25
Group C (atypical field defect)	13	18.84
Total	69	100.00

Table 4. Age and post-operative visual acuity

Age (yr)	Total No. patients	Postoperative visual acuity					
		Improved		Stable		Deteriorated	
		No.	%	No.	%	No.	%
0-15	7	1	14.29	2	28.57	4	57.14
16-30	9	2	22.22	3	33.33	4	44.44
31-45	34	7	21.59	14	41.18	13	38.23
46-60	14	2	14.28	6	42.86	6	42.86
61-75	5	-	-	5	100.00	-	-

Miller et al observed that increasing age had an effect on the final visual outcome, when all other parameters - such as type and size of tumor and duration of symptoms - were matched[14]. Although these parameters were not matched in the present study, fewer patients with advanced age tended to improve post-operatively (Table 4), perhaps because of decreased neuronal regeneration with advancing age. The duration of visual symptoms had a reciprocal relationship to the degree of improvement, irrespective of the degree of visual loss[2,13,15]. Table 1 shows that patients, whose symptoms lasted less than twelve months, had the most improvement.

Bitemporal hemianopia has been considered the hallmark of pituitary tumors due to chiasmal compression from below[16,17]. 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 constriction and arcuate scotoma. Similarly, Trautman et al noted visual fields were affected more frequently than visual acuity[18]. A conclusion in the present study regarding improvement of post-operative perimetry is not possible due to limited data.

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 eye pain, diplopia, or ptosis should be carefully examined for evidence of suprasellar tumors.

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อาการทางตาของเนื้องอกสมองบริเวณเหนือ sella

กิตติศักดิ์ กิจทวีสิน, ฉัตรชัย พลอยประสิทธิ์

วัตถุประสงค์: *ศึกษาอาการทางตาในผู้ป่วยเนื้องอกสมองบริเวณเหนือ sella และศึกษาปัจจัยที่อาจมีผลต่อการมองเห็น*
วัสดุและวิธีการ: *ศึกษาข้อมูลย้อนหลังจากเวชระเบียนผู้ป่วยที่ได้รับการวินิจฉัย เป็นเนื้องอกสมองบริเวณเหนือ sella ระหว่างเดือนมกราคม พ.ศ. 2538 ถึงเดือนธันวาคม พ.ศ. 2548 จำนวน 69 ราย*
ผลการศึกษา: *ร้อยละ 39 เป็นเพศชาย ร้อยละ 61 เป็นเพศหญิง อายุเฉลี่ย 38 ปี(6 -75 ปี) ระยะเวลาของอาการระหว่าง 4 วันถึง 5 ปี (เฉลี่ย 7.7 เดือน) อาการทางตา ได้แก่ ตามัว 59 ราย(ร้อยละ 86) ปวดตา 6 ราย (ร้อยละ 9) ภาพซ้อน 3 ราย(ร้อยละ 4) และหนังตาตก 1 ราย(ร้อยละ 1) ผลวินิจฉัยโรคสุดท้ายเป็น pituitary adenoma, meningioma, และ craniopharyngioma ร้อยละ48, 28, 25 ตามลำดับ เมื่อแบ่งผู้ป่วยตามระดับสายตาก่อนผ่าตัดเป็นกลุ่ม 1 (6/5 ถึง 6/12) กลุ่ม 2 (6/18 ถึง 6/36) และกลุ่ม 3 (6/60 ถึงมองไม่เห็นแสงไฟ) พบว่าระดับสายตาหลังผ่าตัดดีขึ้น ในร้อยละ 29 ของกลุ่ม2 และร้อยละ 25 ของกลุ่ม3 เมื่อแบ่งผู้ป่วยตามลักษณะลานสายตา พบว่า 49 ราย (ร้อยละ71) มีลานสายตาผิดปกติที่จำเพาะกับรอยโรคบริเวณ optic chiasm นอกจากนั้นตรวจพบ relative afferent pupillary defect และขั้วประสาทตาฝ่อในร้อยละ45 และ38 ตามลำดับ*
สรุป: *pituitary adenoma เป็นเนื้องอกสมองที่พบบ่อยบริเวณเหนือ sella โดยตามัวเป็นอาการทางตาที่พบบ่อยสุด และลานสายตาผิดปกติที่พบบ่อยสุดคือ bitemporal hemianopia ซึ่งมักมีลักษณะไม่สมมาตร*