

FUNCTIONAL OUTCOME FOLLOWING SURGERY OF ANTERIOR CRANIAL FOSSA MENINGIOMAS

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Introduction

Intracranial meningiomas are common at the skull base, convexity, falx, and tentorium, with meningotheelial meningioma more prevalent at the base. Skull base meningiomas account for 20-30% of primary meningeal tumors and are complex, benign lesions with a moderate growth rate. Anterior cranial fossa meningiomas (ACFM) include olfactory groove meningioma, planum sphenoidale meningioma, tuberculum sellae meningioma, sphenoid wing meningioma, and diaphragma sellae meningioma. Common symptoms for intracranial meningiomas include seizures, headaches, raised intracranial pressure, psychiatric manifestations, cognitive function, and focal neurological deficit due to compression of the tumor. Diagnosis is reached by imaging (MRI & CT-scan) and biopsy or pathology of the resection specimen.

Aim of the work

The aim of this study was to assess the functional outcomes of patients operated upon for ACFMs. Assessment includes mental, motor, sensory, olfactory, visual, and ocular outcomes for a period of six months.

Methods

This was a retrospective study of 30 patients operated on for anterior cranial fossa meningioma (ACFM) and managed at Alexandria University Hospital. Their demographic, clinical, and imaging data were collected pre-operatively. These patients were monitored for six months after surgery, and clinical outcomes were assessed for improvement, stationary, and deterioration.

Results

All patients were fully conscious and had headaches. Diminution of vision and papilledema in 24 (80.0%) patients, visual field defect in 19 (63.3%), Anosmia in 7 (23.3%), and squint in 6 (20.0%) patients. Behavioral changes and proptosis were present in 5 (16.5%) patients each, whereas hemiparesis and UMN facial palsy were present in 2 (6.7%) patients each, and only 1(3.3%) patient presented with vomiting. Bilateral subfrontal, pterional, and keyhole (eyebrow) approaches were selected in 10 cases (33.3%) for each technique. No single approach demonstrated superior patient outcomes. Postoperatively, all patients recovered except for hemiparesis, which showed a stationary and deteriorating outcome at one month and improved at six months. Most patients showed improvements in symptoms like vision loss in 83.3%, visual field defect in 78.9%, proptosis in 60.0%, and anosmia in 50%.

Some patients showed stationary outcomes like diminution of vision and visual field defect in 3(12.5%) and in 3(15.7%) patients, respectively, followed by anosmia in 1 (50%) and proptosis in (20%). Deteriorated symptoms like diminution of vision, visual field defect, and proptosis were respectively found in 1(4.1%), 1(5.2%), and 1(20.0%).

Table (1):Distribution of age and gender among study group

Demographic Data	No.	%
Age (years)		
35 –	12	40.0
45 –	8	26.7
55 –	9	30.0
≥ 65	1	3.3
Min. – Max.	35.0 – 67.0	
Mean ± SD.	48.77 ± 9.28	
Median (IQR)	47.50 (41.0 – 58.0)	
Gender		
Male	4	13.3
Female	26	86.7

Table (2): Distribution of Tumor Volume among study group

Tumors Volume (cm³)	No.	%
Small (<30)	11	36.7
Medium (30 – <60)	9	30.0
Large (60 – <90)	2	6.7
Giant (≥90)	8	26.7
Min. – Max.	3.93 – 187.56	
Mean ± SD.	58.03 ± 51.14	
Median (IQR)	42.36 (21.20 – 90.14)	

Table (3):Postoperative functional outcomes at different follow-up periods among study groups

Clinical Manifestations		Preoperative		Postoperative clinical outcome						Test of Sig.	p
				At 1 month		At 3 months		At 6 months			
		No.	%	No.	%	No.	%	No.	%		
Headache	Absent	0	0.0	4	13.3	0	0.0	–	–	Q= 8.000*	0.018*
	Present	30	100.0	26	86.7	0	0.0	–	–		
Vomiting	Absent	29	96.7	30.0	100.0	30.0	100.0	30.0	100.0	–	–
	Present	1	3.3	0	0.0	0	0.0	0	0.0		
Behavioral changes	Absent	25	83.3	21	70.0	28	93.3	30	100.0	Q= 17.250*	0.001*
	Present	5	16.7	9	30.0	2	6.7	0	0.0		
Anosmia	Absent	23	76.7	22	73.3	25	83.3	27	90.0	Q= 5.710	0.127
	Present	7	23.3	8	26.7	5	16.7	3	10.0		
Diminution of vision	Absent	9	30.0	2	6.7	4	13.3	26	86.7	Q= 42.386*	0.001*
	Present	21	70.0	28	93.3	26	86.7	4	13.3		
Papilledema	Absent	6	20.0	10	33.3	27	90.0	30	100.0	Q= 58.348*	<0.001*
	Present	24	80.0	20	66.7	3	10.0	0	0.0		
Visual field defect	Normal	0	0.0	0	0.0	0	0.0	26	86.7	Fr= 59.485*	0.001*
	Stationary	11	36.7	5	16.7	4	13.3	4	13.3		
	Improvement	19	63.3	25	83.3	26	86.7	0	0.0		
Proptosis	Absent	25	83.3	25	83.3	29	96.7	28	93.3	Q= 10.200*	0.017*
	Present	5	16.7	5	16.7	1	3.3	2	6.7		
Squint	Absent	24	80.0	27	90.0	27	90.0	0	0.0	Q= 9.818*	0.020*
	Present	6	20.0	3	10.0	3	10.0	0	0.0		
Contralateral Hemiparesis	Absent	28	93.3	25	83.3	27	90.0	30	100.0	Q= 7.800	0.050
	Present	2	6.7	5	16.7	3	10.0	0	0.0		
Contralateral UMN facial palsy	Absent	28	93.3	29	96.7	29	96.7	30	0.0	Q= 4.000	0.261
	Present	2	6.7	1	3.3	1	3.3	0	0.0		

Conclusion

Meningiomas, the most common primary CNS tumors in adults, are diagnosed through imaging and biopsy, causing seizures, headaches, and cognitive symptoms, with most patients improving post-surgery, and some experiencing decreased vision.