

Gamma Knife Radiosurgery for Management of Peri-optic Meningiomas

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Learning Objectives

: This retrospective study aims at evaluating gamma knife radiosurgery (GKRS) as a treatment modality for management of benign meningiomas in direct contact with the anterior visual pathway, and assessment of its long term effect over tumor control and visual outcome.

Introduction

: Perioptic meningioms pose considerable therapeutic challenges because of their proximity to important cranial nerves, vasculature, and endocrine tissue at the anterior cranial base.

Methods

: This is a retrospective analysis of a prospectively maintained, institutional data-base in the Cairo Gamma Knife Centre in Nasser Institute. The study material included two hundred thirty three consecutive patients with benign skull base meningiomas in direct contact or displacing the anterior visual pathway treated by single session gamma knife radiosurgery during the period between July 2001 & July 2011 (10 years).

Results

: Patients were assessed clinically, with neuroimaging and visual field at routine intervals following GKRS. There were (81%) females and (19%) males with an age range (16-80 years). Sixty seven patients (29%) had undergone at least one resection before GKRS, The mean follow-up after GKRS was 47 months (range 23–136 months). At the last follow-up, tumor volumes remained stable or decreased in 94.8% of patients. Actuarial progression-free survival rates at 3, 5, 8, and 10 years were 99%, 94%, 87%, and 62%, respectively. At the last clinical follow-up, 42% of patients demonstrated improvement visual outcome, 52% were stable, and 6% had worse visual outcome. 51% of patients that had pretreatment ocular nerve palsy improved. perifocal brain oedema was the most common complication after treatment (10.7%).

lesion site: 202 (87%) lesions were touching or even displacing the AVP and the other 31 (13%) laid only 0.5 -3 mm away.

Site of origin	Freq.	Percent	
Sphenoid wing	48	20.6%	
Anterior clinoidal	32	13.73%	
Cavernous sinus	32	13.73%	
Planum sphenoidal	14	6%	
Olfactory groove	10	4.29%	
petroclival	9	3.86%	
Tuberculum sellae	7	3%	
Clival	4	1.72%	
Posterior clinoidal	3	1.29%	
CPA	2	0.86%	
medial temporal	2	0.86%	
orbital	2	0.86%	
parasellar	49	21.03%	
suprasellar	16	6.87%	
sellar	3	1.29%	
Total	233	100	

Radiological follow-up	Freq.	Percent
enlargement	12	5.15%
shrinkage	83	35.62%
Stable	138	59.23%

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Max dose to AVP	Improved VF	Stable VF	Worse VF	Total
≤ 10 Gy	93	102	15	210
	44.3%	48.6%	7.1%	100%
>10 Gy	6	17	0	23
	26.1%	73.9%	0%	100%
Total	99	119	15	233
	42.5%	51.1%	6.4%	100%

Conclusions

: Single session GKRS is an effective and minimally invasive option for the treatment of perioptic meningiomas. offering a reasonable rate of tumor control with a considerable rate for tumor shrinkage and a low incidence of complications.







