Gamma Knife Radiosurgery for Intracranial Hemangioblastomas

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Introduction

Gamma knife radiosurgery (GKRS) has become an option for tumor control in hemangioblastoma as both an upfront treatment (especially for non-accessible tumors), and for recurrent and/or residual cases that failed surgical resection. It has the capability of treating multiple lesions in one single session in a minimally invasive way, preventing multiple surgical procedures. The objective of this study was to analyze clinical outcome and tumor control rates.

Methods

We conducted a retrospective chart review of 12 patients with a total of 20 intracranial hemangioblastomas treated with GKRS at the Cleveland Clinic from May 1998 until December 2014. Median age at time of GKRS was 51.7 years (34-80). Four patients had multiple lesions. Four patients had von Hippel-Lindau disease, with a combined total of 11 tumors. The majority of tumors were solid (18) and located in the cerebellum (19). GKRS was employed as the primary treatment in 9 lesions, and utilized to treat recurrence in the other 11 tumors. Median prescription margin dose was 24Gy (14-25).

Learning Objectives

After conclusion of this study, one should be able to:

1)Identify the treatment options for intracranial hemangioblastomas;

2)Recognize gamma knife radiosurgery as an effective and safe treatment option for intracranial hemangioblastomas;

3)Interpret the situations in which radiosurgery plays an important role as a treatment option.

Results

Median follow up was 64 months (2-184). Median tumor volume pre-GKRS was 946 mm3 (79-15970), while median tumor volume post-GKRS was 356 mm3 (30-5404). This equated to a median percentage reduction in tumor volume of 46%, with 17 tumors (85%) being stable or decreased in size, while the remaining 3 tumors (15%) showed evidence of radiographic progression at last follow up. Tumor control rates were 100% at 1 year, 90% at 3 years, and 85% at 5 years, using the Kaplan–Meier method. Two patients experienced complication (hydrocephalus and radiation necrosis, respectively). There were no statistically significant univariate predictors of progression identified, although there was a trend towards successful tumor control in solid tumors (p=0.07).

References

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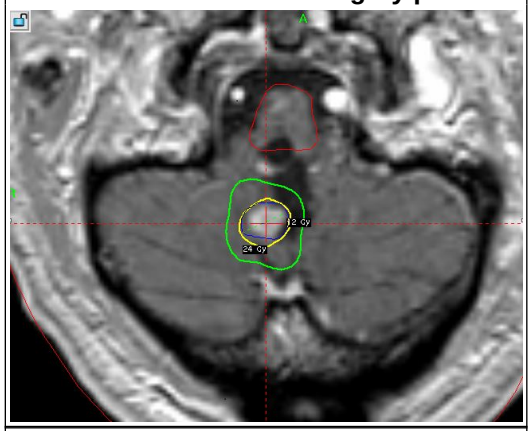
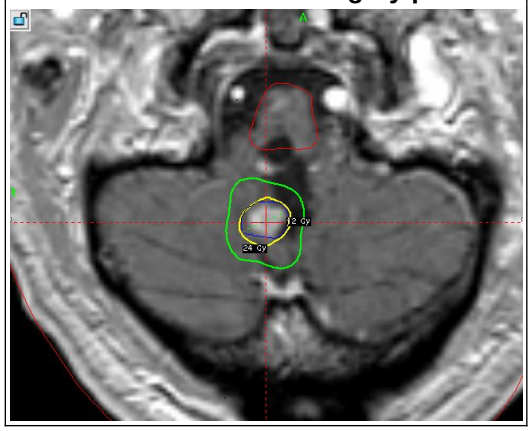
Conclusions

GKRS is an effective and safe option for treating intracranial hemangioblastomas with favorable tumor control rates.

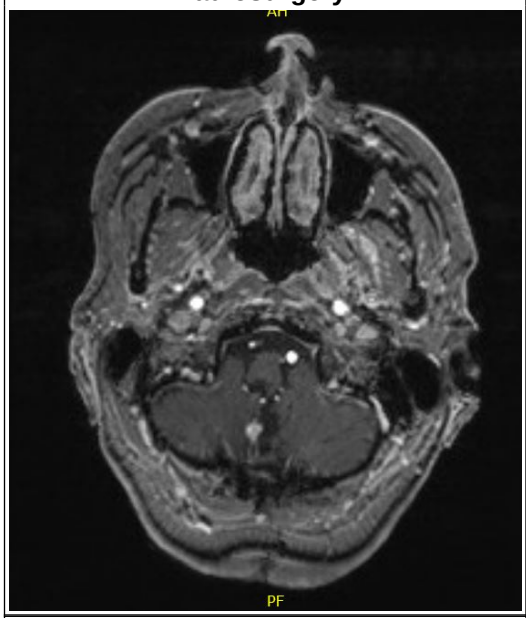
Gamma Knife radiosurgery plan



Gamma knife radiosurgery plan



8 months post gamma knife radiosurgery



6 months post gamma knife radiosurgery