

Long Term Follow-up After Stereotactic Radiosurgery For The Treatment of Intracranial Meningiomas

John M. McGregor MD; Mario Ammirati MD; Christopher E. Pelloski MD; John Grecula; Nina A Mayr MD; Nilendu Gupta; Lu Lanchun PhD; Susan Bell RN MS CNRN CNP The Ohio State University Wexner Medical Center



Introduction

Complete surgical resection of intracranial meningiomas including the dura of origin and infiltrated bone remains the treatment of choice. Factors such as residual disease, advanced tumor grade, location within the cranial vault, or patient comorbidities may limit the success of surgery alone. Stereotactic radiosurgery (SRS) expands the options for treatment. We review the outcomes in patients with meningiomas treated with SRS at our institution from 1999 – 2012.

| Characteristics | Number |
|---------------------------------|--------------------|
| Total Patients | 81 |
| Sex (Male/Female) | 19/62 |
| Age in years | 56 (range 19-86) |
| Mean | 63 |
| Number of Lesions | 89 |
| Convexity | 39 |
| Parafalcine | 19 |
| Skull Base | 31 |
| Grade | |
| I | 27 |
| II | 17 |
| III | 1 |
| No confirmed path | 44 |
| Tumor Volume (cm ³) | 8.745 (n=52) |
| < 4 cm ³ | 27 (52%) |
| 4-13 cm³ | 18 (35%) |
| >13 cm ³ | 7 (13%) |
| Dose Gy | 16.0 (range 10-31) |
| Mean | 16.5 |
| Isodose % | 50.8 (range 47-75) |
| Mean | 55 |
| Prior Treatments | |
| Surgery | 39 |
| Radiotherapy (RT) | 12 |
| Progression | 7 |
| Grade I | 1 |
| Grade II | 4 |
| No confirmed | 2 |
| | |

Methods

A retrospective review was performed of 78 patients with 82 presumed or confirmed meningiomas treated with SRS over the 13 year period. The median age was 56 (range 17 - 84). There were 19 males and 59 females. The median marginal dose was 15.95 Gy (range 10 - 31 Gy) to an averaged 51% isodose line (range 47 - 70%). 39 patients had undergone surgery and 10 patients previous radiation therapy prior to SRS. We report 1, 3, 5 and =10 year followup after SRS.

Results

The majority (n = 53) of tumors (65%) were located in the falx/parasagital or cerebral convexities while the others (n = 28) involved the skull base (34%). Tumor histology when available included 21 WHO grade I, 15 WHO grade II and 1 WHO grade III meningiomas. 45 patients had no definitive pathology. Seven lesions required further treatment during the follow up period (9%), either further radiation or surgery. Three of these progressive lesions were tumors at the skull base, and 4 were convexity/parasagital in location. Four of these tumors were known WHO grade II. Two were WHO grade I, and one did not have confirmatory pathology

Case Presentation - Regression

42 y/o woman with balance difficulties, vertigo, diabetes, stroke, multiple meningiomas, progressive on MRI. WHO Grade I by path. SRS 6-2006 for foramen magnum lesion Follow up MRI 4-2012



References

Pollock BE, et al. Neurosurgery. 2012: 71(3):604-12 Hasseleid BF, et al. J Neurosurg. 2012: 117(6):999-1006 Sughrue, et al. J Neurosurg 2010: 13:1029-1035, Mc McGregor, JM, Sarkar, AS Otolaryngol Clin North Am. 2009 Aug;42(4):677-88 Zachenhofer I, et al. Neurosurgery. 2006: 58(1) 28-36 Santacroce A, et al. Neurosurgery. 2012;70(1):32-39

Case Presentation - Progression

69 year old female presented w/ balance and falling episodes 9/30/2003 - MRI demonstrated large extra-axial parafalcine lesion 10/29/2003 - Bifrontal Cran; path: atypical, WHO Grade 2 10/8/2004 - SRS for progression 1/20/2009 - Redo SRS for progression 2/22/2012 - Surveillance



Conclusions

Radiosurgery is a reasonable adjunct to management of patients with primary, residual or recurrent meningiomas and presumed meningiomas. The control rates are > 90%. Longer follow up evaluations are still needed.