

# EVALUATION OF INTRACRANIAL LESIONS AROUND OPTIC STRUCTURES TREATED WITH STEROTACTIC RADIOSURGERY

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## Introduction

- Stereotactic radiosurgery (SRS) is a non-invasive therapy that can be used to target various tumors of the brain.
- Lesions in the brain are often close to sensitive structures including cranial nerves and compression of local structures or damage during therapy can result in various symptoms that could have long term impact to patients.
- SRS aims for precise targeted therapy; however, observing adverse effects remains essential for studying the long-term outcomes of radiation therapy.
- Exploring both the efficacy and complications of SRS will help to further guide risk and benefits for individualized therapy.
- Tumors near the base of the skull can have effects to the visual pathway and pituitary gland, both of which could have serious long-term effects for patients.
- Meningiomas and pituitary adenomas are among common brain tumors at the base of the skull, and these patients can be candidates for SRS.

## Methods

- In this retrospective review we treated a total of 21 patients with stereotactic radiosurgery in 5 fractions from 2020-2024 for intracranial lesions near optic structures, including meningiomas and pituitary tumors.
- Collected data included follow up MRI, clinical complications, need for steroids, and survival to date.
- Tumor control and concern for necrosis was assessed on these follow up MRIs. Any increase in size of enhancement was considered as possible progression and was ultimately confirmed with subsequent MRI, clinical parameters, or by surgery.
- Complications were assigned a grade (1-4) based on the Common Terminology Criteria for Adverse Events (CTCAE).

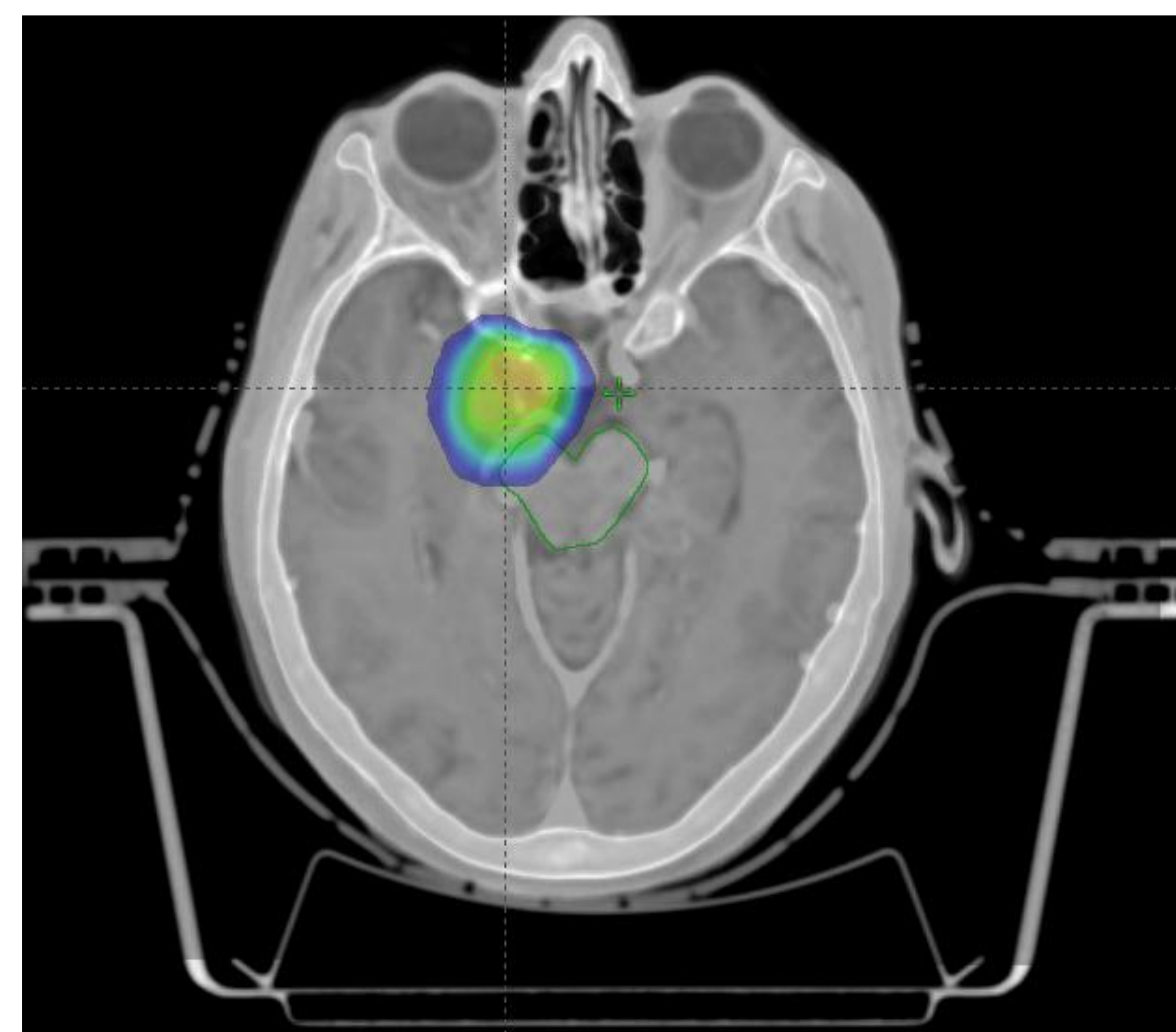


Figure 1: Axial view of 2500cGy in 5fx dose to meningioma using Encompass system

MRI Findings	Number of Patients
Stable	12
Improvement	4
Disease progression	2

	0	1	2	3	4
Fatigue	13	1	1	1	0
Headache	7	4	4	0	0
Paresthesia	12	4	2	0	0
Tinnitus	15	3	0	0	0
Concentration	14	2	1	1	0

	0	1	2	3	4
Blurred Vision	12	4	1	0	0
Eye Pain	13	3	1	1	0
Decreased Vision	10	5	6	0	0
Diplopia	10	4	1	0	0

	0	1	2	3	4
Syncope	14	0	1	1	0
Dizziness	12	2	1	0	0
Vertigo	15	1	0	0	0
Gait Disturbance	12	6	0	0	0
Ataxia	11	7	0	0	0

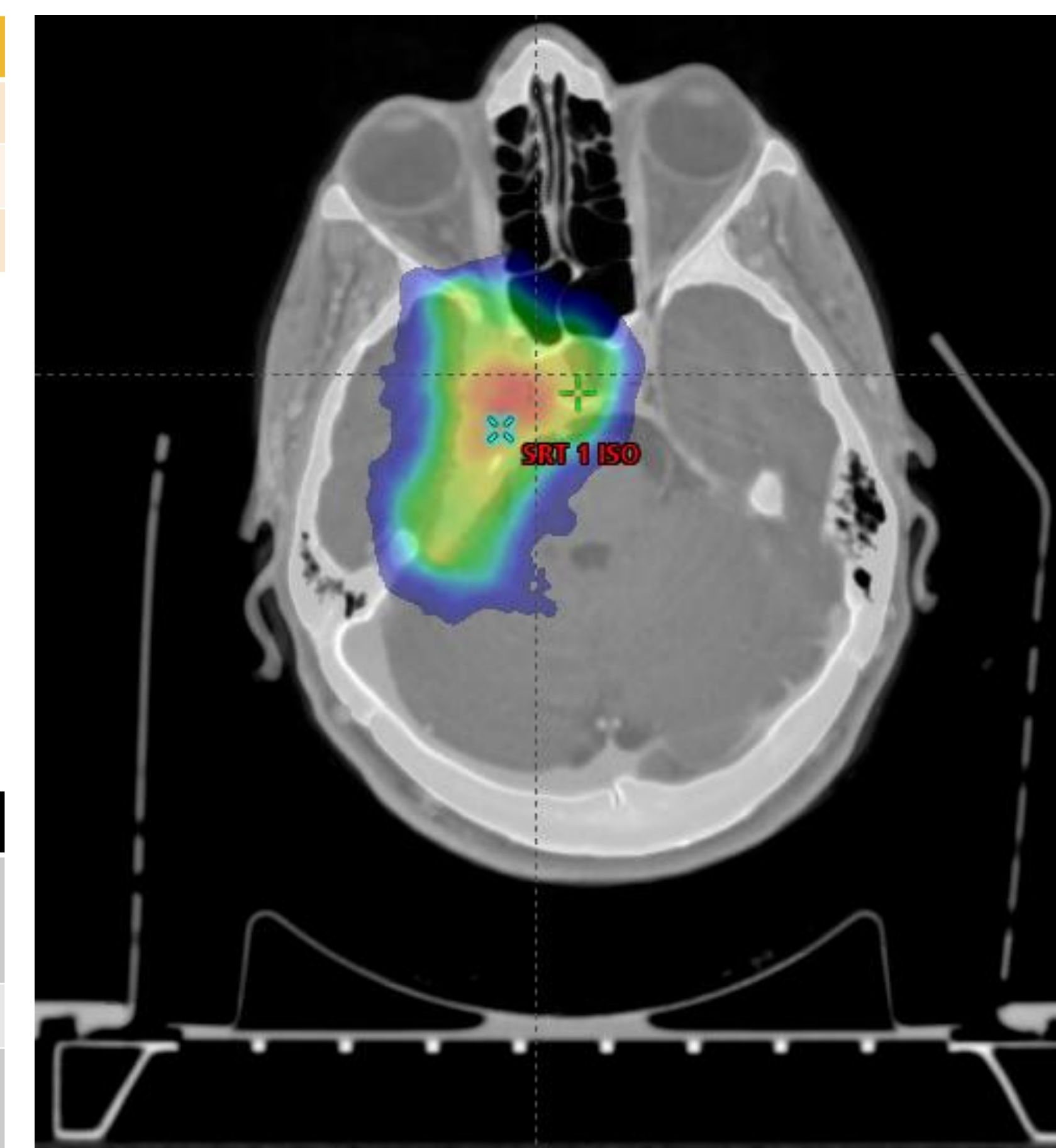
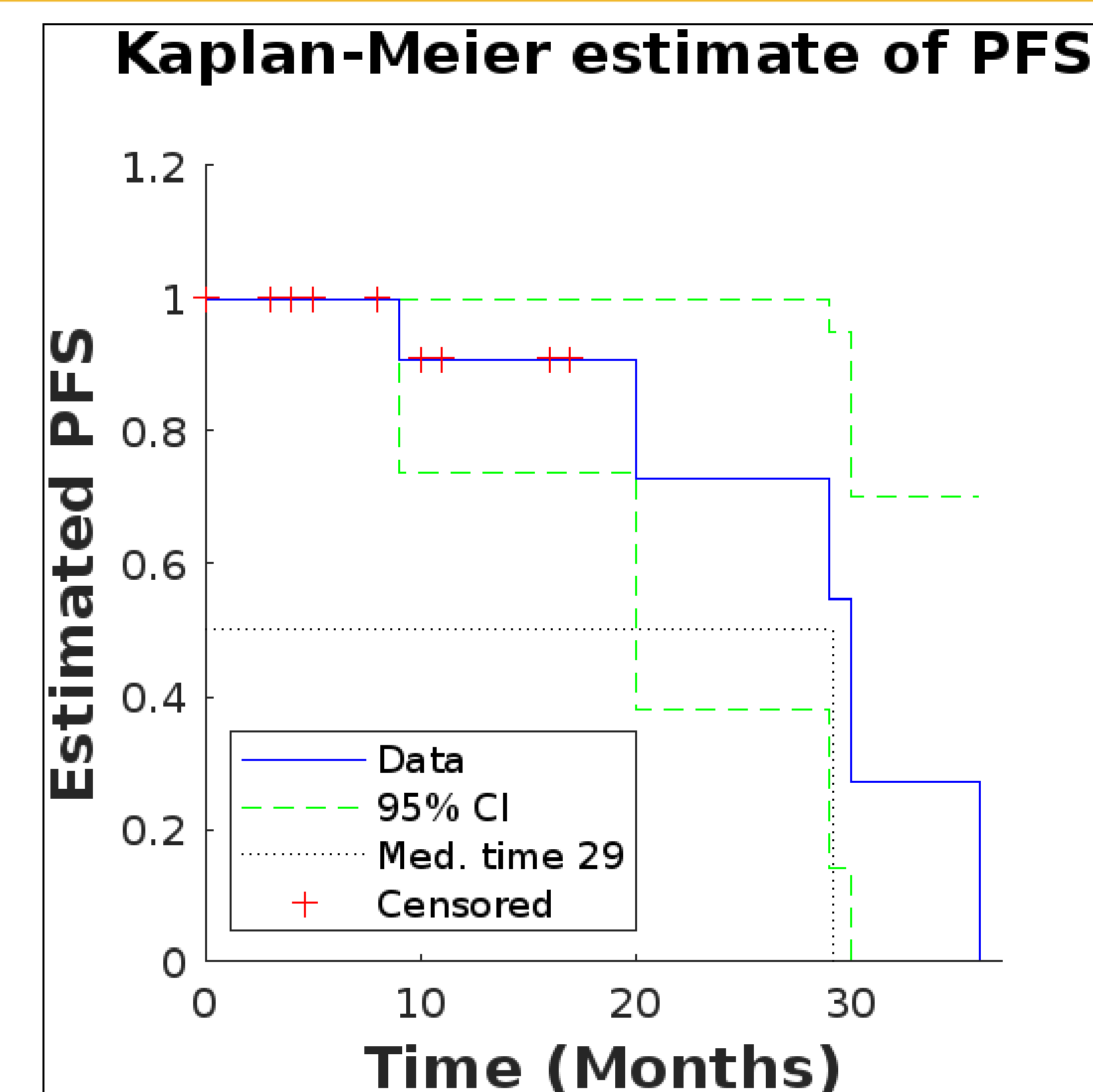


Figure 2: Axial view using custom headrest and SRT mask

## Results

- Of the 19 patients that had a follow up MRI, 12 (63.2%) had findings showing stable disease, 4 (21.1%) showed improvement, 2 (10.5%) showed progression of disease.
- Of the 18 patients that had clinical follow up, neurologic complications were among the most prevalent symptoms. This included headache (44%), paresthesia (33%), diplopia (28%), decreased vision (61%), eye pain (28%), blurred vision (28%), ataxia (39%), dizziness (17%), syncope (11%), seizures (11%), fatigue (17%), concentration (22%). But the majority were grade 1-2.
- Grade 3 events were rare, with one patient developing eye pain, another had unexplained syncope, and one had impaired concentration, that was deemed unrelated to SRS.
- Steroid medication use was noted in 9 patients. One patient took a short taper dose prior to radiation therapy, 2 took a short taper dose following transphenoidal resection, and 2 patients took steroid therapy for unrelated conditions (COPD exacerbation episode; SLE management). A total of 4 patient took maintenance steroids for hypopituitarism for average duration of 23 months.
- Upon chart reviewing, 4 patients were noted to be deceased. 3 patients passed from comorbid conditions including CHF, CKD, and diabetes and 1 patient passed in hospital from acute hypoxic respiratory failure.

## Conclusion

- Following SRS, patients developed various neurologic symptoms, most of which were mild.
- Radiologic follow-up showed most patients with stable or improved disease, consistent with findings in other studies.
- This review may help guide future management, particularly regarding nearby structures potentially affected by treatment.

## References

1. Common Terminology Criteria for Adverse Events (CTCAE). Published online 2017.
2. Ruge MI, Tutunji J, Rueß D, et al. Stereotactic radiosurgery for treating meningiomas eligible for complete resection. *Radiat Oncol Lond Engl*. 2021;16:22. doi:10.1186/s13014-021-01748-y