Assessing Patient Outcomes of Vestibular Schwannoma Patients Following Linear Accelerator Stereotactic Radiotherapy

Hariteja Ramapuram BS[1], Yifei Sun BS[1], Travis Atchley MD[2], Erika Walsh MD[3], John Fiveash MD[4], Philip Schmalz MD[2], Winfield Fisher MD[2], Dagoberto Estevez-Ordonez MD, PhD[2å]

[1]Marnix E. Heersink School of Medicine, University of Alabama at Birmingham, Birmingham AL, USA; [2]Department of Neurosurgery, University of Alabama at Birmingham, Birmingham AL, USA; [3]Department of Otolaryngology, University of Alabama at Birmingham, Birmingham, AL, USA; [4]Department of Radiation Oncology, University of Alabama at Birmingham, Birmingham, AL, USA

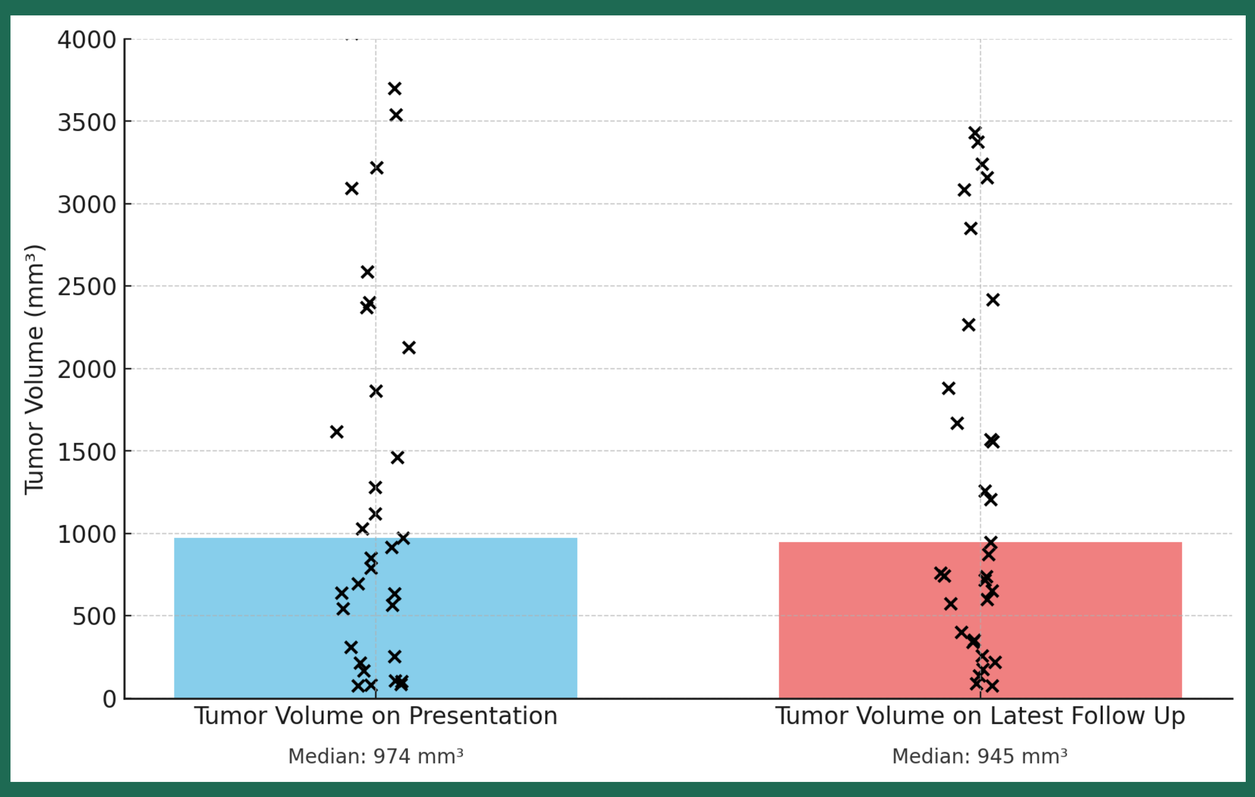
Introduction

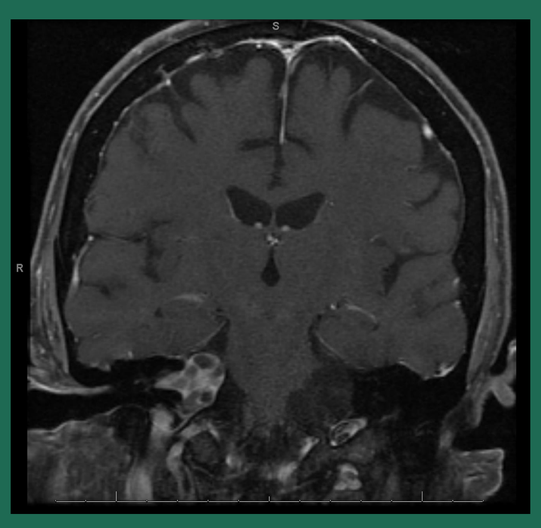
- Vestibular schwannomas (VS) are the most common tumors that are located in the cerebellopontine angle[1]
- Hearing loss, tinnitus, trigeminal neuralgia, palsy, gait ataxia, and intracranial hypertension common presentations of VS[1]
- Common treatment modalities for VS is wait and watch, microsurgical resection, and Intensity-modulated radiotherapy (IMRT)[2]
- LINAC has been shown to have favorable outcome with patients by achieving a good tumor control rate, and when comparing both SRS techniques, LINAC achieves decreased rates of tinnitus in published literature[3]
- **With this study, we aimed to characterize patient outcomes of those that underwent LINAC stereotactic radiosurgery at the University of Alabama at Birmingham (UAB)**

Methodology

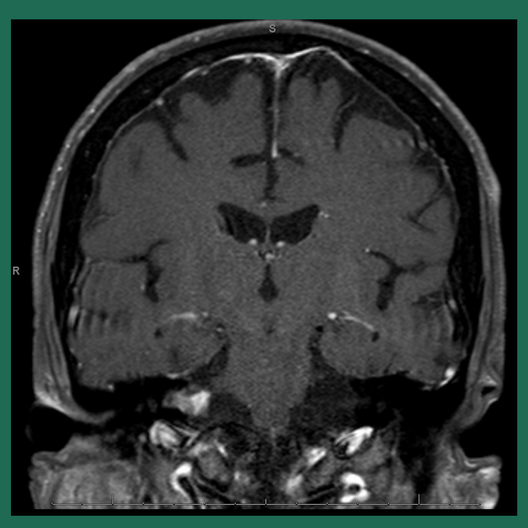
- We retrospectively reviewed adult patients with vestibular schwannomas who underwent LINAC stereotactic radiotherapy from 2013 to 2022.
- Demographic, clinical presentation, perioperative, and postoperative follow-up data were collected via the review of electronic medical records.
- Patient outcomes were assessed using qualitative variables such as hearing loss, tinnitus, cranial nerve deficits, and further outcomes.
- Tumor size was assessed using volumetric MRI analysis at baseline, 1 months, 6 year, and subsequent follow-ups.
- 41 patients were included in the study. Inclusion criteria: Adults (≥18 years old) with a diagnosis of vestibular schwannoma. Underwent LINAC stereotactic radiotherapy at UAB hospitals between 2013 and 2022.

Outcomes On Latest Follow Up (n=41)	
CN V Deficit	3 (7.3%)
CN VII Deficit	5 (12%)
Tinnitus	15 (37%)
Gait Abnormalities	9 (22%)
Vertigo	10 (24%)
Balance Disorder	15 (37%)
Hydrocephalus	4 (9.8%)
Hypoesthesia	2 (4.9%)
Dysesthesia	5 (12%)



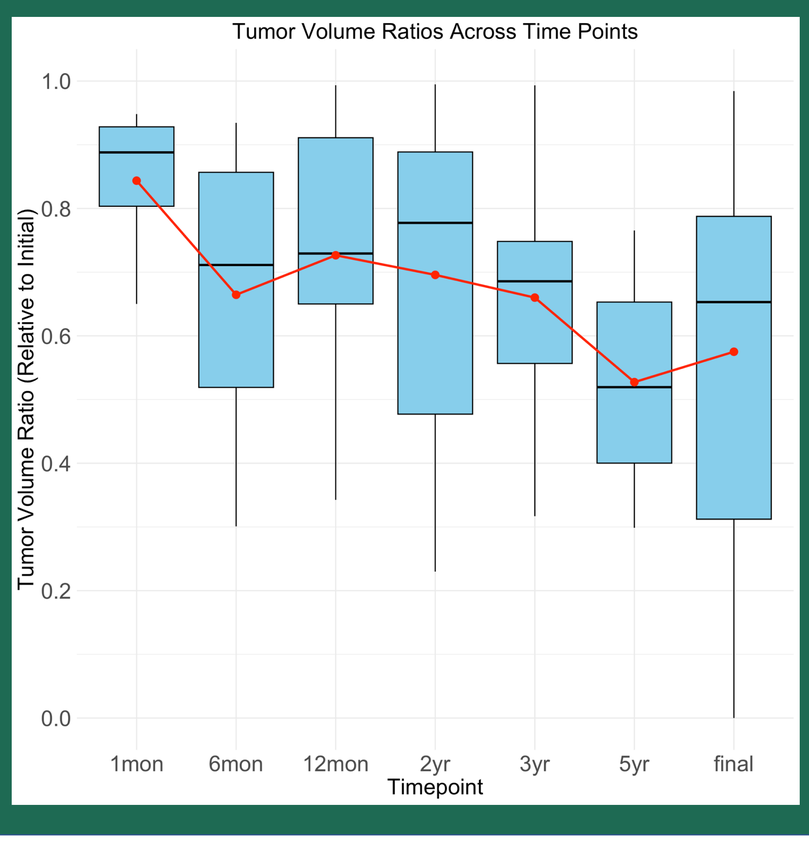


On Presentation



3 Year Follow Up

In the cohort, 10 (24.4%) of patients had full audiology reports before and after LINAC. 4 patients had serviceable hearing before LINAC, and 3 patients had serviceable hearing after LINAC.



Conclusion

IMRT is a safe method of treatment for VS that presents similar outcomes as other methods of SRS. Future studies should seek to validate outcomes in larger cohorts.

Future Direction

We aim to conduct further studies and comparative analyses evaluating patient outcomes following alternative intensity-modulated radiotherapy (IMRT) techniques, such as Gamma Knife radiosurgery, as well as those undergoing microsurgical resection. These investigations will focus on tumor control rates, functional preservation, and long-term complication profiles to provide a comprehensive assessment of treatment efficacy and patient quality of life.

References

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