Congress of Neurological Surgeons Systematic Review and Evidence-Based Guidelines on the Role of Radiosurgery and Radiation Therapy in the Management of Patients With Vestibular Schwannomas.

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QUESTION: What are the indications for stereotactic radiosurgery (SRS) treatment vs observation for patients with intracanalicular vestibular schwannomas without evidence of radiographic progression?

RECOMMENDATION: Level 3: If tinnitus is not observed at presentation, it is recommended that intracanalicular vestibular schwannomas and small tumors (<2 cm) without tinnitus be observed as observation does not have a negative impact on tumor growth or hearing preservation compared to treatment.

QUESTION: Is there a difference in outcome based on radiosurgery equipment used: Gamma Knife (Elekta, Stockholm, Sweden) vs linear accelerator-based radiosurgery vs proton beam?

RECOMMENDATION: There are no studies that compare 2 or all 3 modalities. Thus, recommendations on outcome based on modality cannot be made.

QUESTION: Is there a difference in outcome based on the dose delivered?

RECOMMENDATION: Level 3: As there is no difference in radiographic control using different doses, it is recommended that for single fraction SRS doses, <13 Gy be used to facilitate hearing preservation and minimize new onset or worsening of preexisting cranial nerve deficits.

QUESTION: Is there a difference in outcome based on the number of fractions?

RECOMMENDATION: As there is no difference in radiographic control and clinical outcome using single or multiple fractions, no recommendations can be given.

QUESTION: What is the best time sequence for follow-up images after SRS?

RECOMMENDATION: Level 3: Follow-up imaging should be obtained at intervals after SRS based on clinical indications, a patient's personal circumstances, or institutional protocols. Long-term follow-up with serial magnetic resonance imagings to evaluate for recurrence is recommended. No recommendations can be given regarding the interval of these studies.

QUESTION: Is there a role for retreatment?
**RECOMMENDATION:** Level 3: When there has been progression of tumor after SRS, SRS can be safely and effectively performed as a retreatment.

**QUESTION:** What is the risk of radiation-induced malignant transformation of vestibular schwannomas treated with SRS?

**RECOMMENDATION:** Level 3: Patients should be informed that there is minimal risk of malignant transformation of vestibular schwannomas after SRS.

**QUESTION:** What are the indications for SRS in patients with neurofibromatosis type 2?

**RECOMMENDATION:** Level 3: Radiosurgery is a treatment option for patients with neurofibromatosis type 2 whose vestibular schwannomas are enlarging and/or causing hearing loss. The full guideline can be found at: https://www.cns.org/guidelines/guidelines-management-patients-vestibular-schwannoma/chapter_7.

**KEYWORDS:** Fractionated radiotherapy; Gamma Knife; LINAC; Proton beam; Radiation; Radiosurgery; Vestibular schwannoma

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