

Review of Guidelines and Strategies for Large Vestibular Schwannomas

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INTRODUCTION

Large vestibular schwannomas (VS) can lead to brainstem compression and cranial nerve dysfunction, becoming a significant peril for patients. Globally, treatment guidelines and strategies differ, but unanimously microsurgery for tumor resection is the favored first line intervention. Recently, an upfront strategy of subtotal resection (STR) with planned stereotactic radiosurgery (SRS) afterwards has gained traction.

OBJECTIVE

This work aims to review the International Stereotactic Radiosurgery Society (ISRS), European Association of Neuro-Oncology (EANO), and Congress of Neurological Surgeons (CNS) guidelines, summarize the STR with planned radiation strategy and compare this to our institutional strategy of near total or gross total resection followed by observation and delayed radiation if growth.

METHODS

Retrospective chart review for institutional experience and systematic review of literature for guidelines and the STR followed by planned radiation experiences.

RESULTS

Table 1 summarizes recommendations from different guidelines. STR + SRS shows mean facial nerve (FN) preservation rates (House-Brackmann I or II) at last follow-up (ranging from 7.2 -113 mos median FU) to be 94.4% (56%-100%) and mean tumor control (stable to reduced) at 89.9%. (78.6% - 100%). Institutional experience of two senior skull base surgeon showed 26 patients with VS > 3cm had tumor resections from 2015-2022 with mean FU 49.9 mos (median 56 mos, 1-119mos. A GTR + NTR rate of 73.1% with growth of 15.4% (4/26) of tumors without GTR and 11.5% (3/26) of patients received radiation due to growth. Facial nerve preservation at last FU was 80.8%.

CONCLUSION

FN preservation and tumor control is comparable with both strategies. Both strategies are safe and longer term follow up needed for both. Decision on strategy must be tailored to each patient and factors such as patient age, comorbidities, and clinical status of patient are important factors to consider.

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	EANO	ISRS	CNS
Small	Koos Grade I-II	Koos I-III, growing and small to moderate size. Single fraction RS SUPERIOR to Observation SUPERIOR to Fractionated SRT	≤1.5cm, Observation SUPERIOR to Surgery or SRS
	Asymptomatic: Observation (IIC) or SRS (IIB)		
	Complete Hearing Loss: Observation (IIC) or SRS (IIB) SUPERIOR to Surgery (IIC)		
Medium	Koos Grade III-IV, <3cm. Surgery or SRS	Koos I-III, growing and small to moderate size. Single fraction RS SUPERIOR to Observation SUPERIOR to Fractionated SRT	(1.5xm<x<2.5cm, Surgery or/and SRS
Large	(Koos grade IV, >3cm). Surgery INFERIOR to Surgery + SRS. Evidence Class IV. Recommendation Ivl Good practice point (GPP)	(Koos Grade IV) Surgery	(Large, >2.5cm) Surgery

Table 1: Guideline Recommendations

Strategy/Parameter	Sample Size	Tumor Size	Tumor Control	Volume of Tumors that Grew	Functional Preservation HB I-II	Follow Up
Meta-analysis of STR with Planned SRS ¹	677pts	Koos Grade IV or >3cm	89.9% (86.9-92.9)	NA	94.4% (91.4-97.4)	Median 7.2-74mo
GTR with Salvage SRS (University of Groningen Netherlands) ²	55pts	Koos Grade IV or >3cm, Mean Vol 12.2cc	7/55 growth. With mean tumor volume of 0.55cc. 48/55 no growth 0.17cc.	0.55cc	HB I-III 90.4%	Mean 35.4mo
IU GTR with Salvage SRS	26pts	>3cm	88.5%, 3/26 with Growth	0.46cc	80.80%	Median 56mo
Total GTR with Salvage SRS	81pts	Koos Grade IV or >3cm	87.70%	0.52cc	Hb I-III 92.4%	Median 42mo

Table 2: Outcomes from the strategies.