# Vestibular schwannoma subtotal resection

Vestibular schwannoma surgery (VS) remains controversial. Historical surgical series prioritized gross total resections (GTR); however, near total resections (NTR) and intentional subtotal resections (STR) aiming at improving cranial nerve outcomes are becoming more popular.

---

Hybrid strategy of STR and adjuvant SRS provides patients with large VS excellent tumor control and a good clinical outcome [1].

---

Reviews of the literature have revealed that in the event of partial removal, the residual VS in patients who had undergone near total resection (NTR) versus subtotal resection (STR) showed an incidence of regrowth ranging from 0.0% to 3.5% versus 18.4% to 73.9%, respectively [2] [3] [4] [5] [6] [7] [8] [9] [10]

---

The Ki-67 analysis results were compared with tumor regrowth to determine the presence of a correlation between this proliferative index and postoperative tumor regrowth. Study Design Seventeen adult patients (7 male, 10 female) were retrospectively reviewed. Nine (52.9%) and eight (47.1%) patients underwent NTR and STR, respectively. Postoperative clinical and radiological data associated with vestibular schwannoma growth were compared with the Ki-67 immunohistochemical analysis results. Results Evidence of clinically significant regrowth was observed in four (23.5%) patients. Patients who underwent NTR had a lower rate/incidence of tumor regrowth than did patients who underwent STR. Patients with a higher Ki-67 index had the highest tumor regrowth rates. The study indicates that assessment of the Ki-67 index may be useful for determining the probability of regrowth of vestibular schwannomas when only partial resection is accomplished [11].

---

The main purpose of a article was to assess the tumor control and facial nerve outcomes in VS patients treated with STR or NTR.

VS patients undergoing STR or NTR at our institution between 1984 and 2016 were retrospectively reviewed. Patient demographics, extent of tumor resection, facial nerve injury, tumor recurrence, and need for Gamma Knife radiosurgery were analyzed. Facial nerve outcomes were quantified using House-Brackmann (HB) scores. Tumor regrowth was defined by the San Francisco criteria. Results Four-hundred fifty-seven VS resections were performed in a 32-year period. Sixty cases met inclusion criteria. The mean (range) follow-up duration was 30.9 (12-103) months. The STR cohort ( n = 33) demonstrated regrowth in 12 patients (36.3%) at an average of 23.6 months. The NTR cohort ( n = 27) did not experience tumor recurrence. Risk of tumor recurrence was positively correlated with preoperative tumor size ( p = 0.002), size of residual tumor ( p < 0.001), and STR ( p < 0.001). Facial nerve outcomes of HB1-2 were observed in the majority of patients in both cohorts (74.1% NTR, 56% STR), though NTR was associated with a higher likelihood of facial nerve recovery ( p = 0.003).

GTR remains the gold standard as long as facial nerve outcomes remain acceptable. NTR achieved superior tumor control and higher likelihood of facial nerve recovery compared with STR [12].

Surgical strategy in vestibular schwannomas may require subtotal resection to preserve neurological function. Residual tumor growth pattern and contrast enhancement in the immediate post-resection period remains uncertain. Heller et al. sought to evaluate changes in the enhancement pattern and volume of vestibular schwannomas after subtotal resection in the immediate post-operative period.

Volumetric analysis of tumor size and enhancement patterns of vestibular schwannomas were measured on MRIs obtained within three days of surgery, three months after surgery, and one year after surgery.

Nineteen patients were eligible for inclusion in the study (nine males and ten females) with an average age of 47 years. Contrast enhancement was absent in 6/19 (32%) of cases on the immediate post-resection MRI with return of expected enhancement on subsequent studies. Volumetric analysis identified that tumors decreased in size by an average of 35% in the first three months ($p = 0.025$) after resection and 46% in the first year after resection ($p<0.01$).

Vestibular schwannomas that undergo subtotal resection tend to decrease in size over the first 3 months after resection. Residual tumor volume may fail to enhance on the immediate post-resection MRI. Both of these findings could lead surgeons to misinterpret degree of resection after surgery and have implications for clinical decision making and research reporting in the scientific literature for vestibular schwannomas after subtotal resection [13].

1)
Radwan H, Eisenberg MB, Sandberg Knisely JP, Ghaly MM, Schulder M. Outcomes in Patients with Vestibular Schwannoma after Subtotal Resection and Adjuvant Radiosurgery. Stereotact Funct Neurosurg. 2016;94(4):216-224. doi: 10.1159/000447520. Epub 2016 Aug 12. PMID: 27513938.
2)
Chen Z, Prasad SC, Di Lella F, Medina M, Piccirillo E, Taibah A, Russo A, Yin S, Sanna M. The behavior of residual tumors and facial nerve outcomes after incomplete excision of vestibular schwannomas. J Neurosurg. 2014 Jun;120(6):1278-87. doi: 10.3171/2014.2.JNS131497. Epub 2014 Apr 11. PMID: 24724851.
3)
Bloch DC, Oghalai JS, Jackler RK, et al. The fate of the tumor remnant after less-than-complete acoustic neuroma resection. Otolaryngol Head Neck Surg 2004; 130: 104–112.
4)
Fukuda M, Oishi M, Hiraishi T, et al. Clinicopathological factors related to regrowth of vestibular schwannoma after incomplete resection. J Neurosurg 2011; 114: 1224–1231.
5)
Schwartz MS, Kari E, Strickland BM, et al. Evaluation of the increased use of partial resection of large vestibular schwanommas: facial nerve outcomes and recurrence/regrowth rates. Otol Neurotol 2013; 34: 1456–1464.
6)
Seol HJ, Kim CH, Park CK, et al. Optimal extent of resection in vestibular schwannoma surgery: relationship to recurrence and facial nerve preservation. Neurol Med Chir (Tokyo) 2006; 46: 176–180.
7)
Vakilian S, Souhami L, Melançon D, et al. Volumetric measurement of vestibular schwannoma tumour growth following partial resection: predictors for recurrence. J Neurol Surg B Skull Base 2012; 73: 117–120.
8)
Sughrue ME, Kaur R, Rutkowski MJ, et al. Extent of resection and the long-term durability of vestibular

schwannoma surgery. J Neurosurg 2011; 114: 1218–1223.
9)

Virk JS, Tripathi S, Randhawa PS, et al. Tumour resection volumes and facial nerve outcomes for vestibular schwannomas. Indian J Otolaryngol Head Neck Surg 2014; 66: 191–195.
10)

El-Kashlan HK, Zeitoun H, Arts HA, et al. Recurrence of acoustic neuroma after incomplete resection. Am J Otol 2000; 21: 389–392.
11)

Iannella G, de Vincentiis M, Di Gioia C, Carletti R, Pasquariello B, Manno A, Angeletti D, Savastano E, Magliulo G. Subtotal resection of vestibular schwannoma: Evaluation with Ki-67 measurement, magnetic resonance imaging, and long-term observation. J Int Med Res. 2017 Jun;45(3):1061-1073. doi: 10.1177/0300060516686873. Epub 2017 Apr 27. PMID: 28447494; PMCID: PMC5536425.
12)

Strickland BA, Ravina K, Rennert RC, Jackanich A, Aaron K, Bakhsheshian J, Russin JJ, Friedman RA, Giannotta SL. Intentional Subtotal Resection of Vestibular Schwannoma: A Reexamination. J Neurol Surg B Skull Base. 2020 Apr;81(2):136-141. doi: 10.1055/s-0039-1679898. Epub 2019 Mar 1. PMID: 32206531; PMCID: PMC7082167.
13)

Heller RS, Joud H, Flores-Milan G, Franzese R, Ford J, Nelson J, Decker S, Mhaskar R, van Loveren H, Agazzi S. Changing enhancement pattern and tumor volume of vestibular schwannomas after subtotal resection. World Neurosurg. 2021 Apr 22:S1878-8750(21)00600-8. doi: 10.1016/j.wneu.2021.04.059. Epub ahead of print. PMID: 33895370.

From:
https://neurosurgerywiki.com/wiki/ - **Neurosurgery Wiki**

Permanent link:
**https://neurosurgerywiki.com/wiki/doku.php?id=vestibular_schwannoma_subtotal_resection**

Last update: **2024/06/07 02:56**