Recurrent vestibular schwannoma

- Hydrocephalus after Gamma Knife Surgery for Vestibular Schwannoma Resolved by Tumor Removal without Cerebrospinal Fluid Diversion: Report of Two Cases
- Genetic Analysis of Intracranial Schwannomas: Differential NF2 Alteration Frequencies in Nonvestibular Schwannomas Versus Vestibular Schwannomas
- Surgical management of schwannomas in schwannomatosis: a comprehensive analysis of clinical outcomes and determinants of local recurrence
- Automated Operative Phase and Step Recognition in Vestibular Schwannoma Surgery: Development and Preclinical Evaluation of a Deep Learning Neural Network (IDEAL Stage 0)
- Sex-specific difference in treatment success/failure after vestibular schwannoma treatment
- New-onset facial spasm is associated with treatment failure after radiosurgery in vestibular schwannoma
- In-frame insertions of SOX10 are highly enriched and characterize a distinct transcriptomic profile in gastrointestinal schwannomas
- Extracranial Head and Neck Schwannomas

The rate of VS recurrence after total removal is exceptionally low in experienced hands. Undetected microscopic deposits left on crucial points such as the facial nerve, the preserved cochlea nerve, or the fundus of the internal auditory canal could be possible causes for the recurrence. A definite advantage of an ETL approach is the excellent internal auditory canal exposure, resulting in an extremely low rate of VS recurrence. The patients should be followed up to 15 years with gadolinium-enhanced magnetic resonance imaging (with fat suppression sequence in ETL approach cases). Recurrent VS may exhibit a faster growth rate than primary VS [1)]

Nearly 9.2% of vestibular schwannomas (VS) recur.

Ki-67

see Ki-67 in recurrent vestibular schwannoma.

Treatment

Treatment for recurrent vestibular schwannoma depends on several factors, including the size of the tumor, the symptoms it is causing, the patient's overall health, and the treatments received previously.

Treatment options for recurrent vestibular schwannoma may include:

Observation: If the tumor is small and not causing significant symptoms, the healthcare team may opt for a watch-and-wait approach. Regular monitoring with imaging studies such as MRI scans will be done to track the tumor's growth.

Surgery: Surgical removal of the tumor may be considered, especially if it is causing symptoms or if it

has significantly increased in size. The goal of surgery is to remove as much of the tumor as possible while preserving facial nerve function.

Radiation Therapy: Various forms of radiation therapy, such as stereotactic radiosurgery (e.g., Gamma Knife or CyberKnife), may be used to target and shrink the tumor. This can be an option for patients who are not good candidates for surgery or prefer a non-invasive approach.

Repeat Radiation: In some cases, a second round of radiation may be considered if the tumor continues to grow after initial radiation treatment.

Book Chapters

89 - 92: Recurrence of Vestibular Schwannomas after Surgery By Pierre-Hugues Roche ; Telmo Ribeiro ; Muhamad Khalil ; Outouma Soumare ; Jean-Marc Thomassin ; William Pellet DOI: https://doi.org/10.1159/000156711 Published: 2008

Case series

Tumour recurrence post-radiosurgery occurred as solid growth in 19 patients (79%), while 5 patients (21%) developed large brainstem-compressing cysts. The median time interval for tumour recurrence post-radiosurgery was similar between cystic and non-cystic recurrent VS (30 vs. 25 months; p=0.08). Cystic recurrences occurred in primarily cystic VS in 3 patients, and new cysts developed in 2 patients with primarily solid VS. Intra-operatively, tumours were firm in 18 cases (75%) and strongly adhered to surrounding structures in 14 cases (58%). All cystic cases underwent cyst decompression, while complete resection of solid tumour components was avoided due to neurovascular adherence. At a mean follow-up of 42±39 months, 12 patients (50%) showed contrast-enhancing tumour residuals in follow-up imaging, including all cystic recurrent cases. Tumour residuals remained stable without requiring further intervention, except for one patient revealing malignant tumour transformation. House-Brackmann grade I/II was preserved in 15 patients (62%). Three patients (13%) developed new facial palsy, and two patients (8%) improved to House-Brackmann grade II. Cystic recurrences had a significantly higher frequency of tumour residuals compared to solid recurrences (100% vs. 37%; p=0.01) but similar rates of facial palsy (60% vs. 32%; p=0.24). Cyst development in VS post-radiosurgery is more common in primary cystic lesions but can also occur in rare cases of primary solid VS. Symptomatic cysts require microsurgical decompression. However, complete resection of the solid tumour component is not crucial for long-term tumour control and should be avoided if it risks neurological function in this delicate area [2)]

Panigrahi et al., from the Department of Neurosurgery, Krishna Institute of Medical Sciences, Secunderabad, Telangana, evaluated the association of cell proliferative markers like MIB with recurrence in Vestibular schwannoma (VS).

Retrospective data of 144 consecutive patients who underwent surgical excision for sporadic VS between January 2010 and July 2015 was collected. Comparison between groups based on recurrence of VS was done.

The average age of the study population was 43.95 ± 12.86 years with 77 (53.5%) men. The average maximal diameter of VS was 40.25 ± 7.23 mm. Gross total resection was done in 52 (36.1%) patients. While near total resection was performed in 81 (56.3%) patients, the remaining 11 (7.6%) patients underwent a sub total resection. The mean follow-up period was 37.99 ± 10.09 months (24 - 60). Recurrence of VS was observed in 18 (12.5%) patients. There was no difference between the groups for diameter of the tumor (42.22 ± 8.04 vs 39.64 ± 7.00 mm; p=0.191). The average MIB index value was higher in patients with recurrence of tumor at follow-up (4.78 ± 5.77 vs 1.89 ± 1.48 mm; p<0.001). There was no difference between the groups for extent of resection or post-operative complications. MIB was the only significant predictor for recurrence (β=1.355 (1.07-1.78;CI 95%); p=0.031). On receiver operating characteristic curves, a cut-off value of 3.5% for MIB showed a specificity of 84.1%.

MIB index ≥ 3.5% are associated with recurrence in VS. Maximal diameter of the tumor and extent of resection are perhaps not associated with recurrence of VS [3)].

Microsurgical treatment of recurrent vestibular schwannoma (VS) is difficult and poses specific challenges. Madjid Samii et al. report their experience with 53 cases of surgically treated recurrent VS. Outcome of these tumors was compared to that of primarily operated on VS. Special attention was given to the facial nerve functional outcome.

A retrospective analysis was performed of the patients who underwent surgery for recurrent VS at one institution from 2000 to 2013. The preoperative data, intraoperative findings, and outcome in terms of facial nerve function and improvement of the preoperative symptoms were analyzed and compared with those in a control group of 30 randomly selected patients with primarily operated on VS. A multivariate regression analysis was performed to test the factors that could affect the facial nerve outcome in each group.

Fifty-three consecutive patients underwent surgery for recurrent VS. Seventeen patients were previously operated on and received postoperative radiosurgery (Group A). Thirty-six patients were previously operated on but did not receive postoperative radiosurgery (Group B). The overall postoperative facial nerve function was significantly worse in Groups A and B in comparison with the control group (Group C). Interestingly, there was no significant difference in the facial nerve outcome among the 3 groups in patients who had good preoperative facial nerve function. The tumor size and the preoperative facial nerve function are variables that significantly affect the facial nerve outcome. Most of the patients showed improvement of the preoperative symptoms, such as trigeminal hypesthesia, gait disturbance, and headache. CONCLUSIONS Complete microsurgical tumor removal is the optimal management for patients with recurrent or regrowing VS. The procedure is safe, associated with favorable facial nerve outcome, and may also improve existing neurological symptoms [4)].

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15 patients (8 females, 7 males; mean age, 37.8 years) with residual or recurrent vestibular schwannomas operated on between 1987 and 2005. These 15 patients were part of a larger series of 252 consecutive vestibular schwannoma excisions. Tumors were classified as large (10) when their diameter exceeded 3.5 cm and giant (5) when their diameter exceeded 4.5 cm. All patients had previously undergone surgery. Hearing was lost in all cases, 8 had complete facial nerve palsy, 6 had trigeminal nerve deficits, 5 had cranial nerve IX and X palsy, and 10 had ataxic gait. Twelve patients had hydrocephalus. The tumors were reoperated through the retrosigmoid-transmeatal approach. The

mean postoperative follow-up was 4.9 years. Complete resection was achieved in all patients. The facial nerve was preserved in 6 of the 7 patients with preoperative facial function. Transient worsening of bulbar cranial nerves palsy occurred in 2 cases. Cerebrospinal fluid leakage occurred in 3 patients. There were no deaths, and the tumors were histologically benign. Surgical removal is the only treatment for these lesions. Total resection associated with a low morbidity rate is possible. Preservation of the facial nerve is difficult due to severe scar tissue [5)]

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