

Translabrynthine approach for vestibular schwannoma case series

2022

A total of 330 consecutive patients were diagnosed between 1973 and 2019 with small- and medium-sized [vestibular schwannoma](#) up to 20 mm in the extrameatal portion submitted to [translabrynthine approach](#).

Main outcome measures: [Facial nerve](#) function according to the [House-Brackmann score](#) at 12-month follow-up, [postoperative complications](#) and entity of [tumor resection](#) assessed with postoperative MRI. A comparative analysis of outcomes between two groups of patients was further conducted, according to tumor size: Group A, small-sized (intrameatal or ≤ 10 mm extrameatal tumors) and Group B, medium-sized VSs (extrameatal between 11 and 20 mm).

Complete tumor [removal](#) was achieved in all cases. The overall complication [rate](#) was 5.5%, being [cerebrospinal fluid leak](#) the most frequent. Patients with small-sized VS (n = 121) presented a significantly better facial nerve function than patients with medium-sized tumors (n = 209), showing House-Brackmann Grades I to II in 92.6% versus 73.6% of cases, respectively (p < 0.001). A nearly 4.5-fold higher risk of poor facial nerve function at 12 months affects patients with medium-sized tumors (odds ratio, 4.473; 95% confidence interval, 2.122-9.430; p < 0.001).

Conclusion: In the current scenario of multioptional VS management, when hearing preservation is not feasible, early TLAB approach as first-line treatment for small-sized VSs showed favorable results. Factors supporting such proactive surgical treatment include long-term definitive cure, no major complications, good facial nerve outcomes, and the possibility of simultaneous hearing rehabilitation with a cochlear implant ¹.

A [pilot case-control study](#) included eight [patients](#) undergoing surgical [labyrinthectomy](#), divided into two groups: four patients who received pre-operative intratympanic [gentamicin](#) and four patients who did not. The post-operative six-canal [video head impulse test](#) responses and length of in-patient stay were assessed.

The average [length of stay](#) was shorter for patients who received intratympanic gentamicin (6.75 days; range, 6-7 days) than for those who did not (9.5 days; range, 8-11 days) (p = 0.0073). Additionally, the gentamicin group had normal post-operative video head impulse test responses in the contralateral ear, while the non-gentamicin group did not.

Pre-operative intratympanic gentamicin improves the recovery following [vestibular schwannoma](#) resection, eliminating, as per the video head impulse test, the impact of labyrinthectomy on the contralateral labyrinth ².

A total of 91 VS patients, who were operated via a TL approach, between March 1997 and December 2016, were analyzed. Demographics, tumor-related factors, and operative findings were collected.

Facial function was assessed according to the House-Brackmann (HB) grading system before surgery, immediately after surgery, and 1-, 3-, 6-months, and 1 year after surgery.

In cases of patients that had a tumor that extended to the CPA, an unsatisfactory facial outcome was noted in 12 (30.0%) patients. FN outcomes after tumor removal depend on tumor size ($p = .040$). Among FN-related factors, only the FN recovery timing was correlated with facial outcomes ($p = .030$). Univariable and multivariable analysis revealed that tumor size and the timing of FN recovery were significant as favorable prognostic factors for good facial outcomes.

Tumor size and the FN recovery timing are significant prognostic factors of facial outcome in VS patients who underwent operations via a TL approach ³⁾.

2017

Five hundred consecutive patients undergoing surgery for vestibular schwannoma via the translabyrinthine approach (excluding neurofibromatosis type 2) under the senior author, with a minimum of 5 years follow-up, were included.

QOL was assessed using the Short Form 36 (SF-36) questionnaire and a disease-specific survey to assess patients' subjective outcomes.

The SF-36 scores in this group were significantly lower than the general UK population, though 24% of respondents reported a subjective improvement in overall QOL. Tumors larger than 4cm were related to a reduced SF-36 total mental component score ($p = 0.037$). Increased age at time of surgery correlated with a reduced physical component of QOL (correlation coefficient = -0.26) and an improved mental component (correlation coefficient = 0.26). Subjective reports of postoperative symptoms and return to work, driving and social activities were similar to other published studies. 35% of patients reported vivid dreams or nightmares following surgery; the first reported incidence of this phenomenon in a large group of vestibular schwannoma patients.

Generic measures of QOL in patients following translabyrinthine surgery for vestibular schwannoma do not always match subjective reports, reflecting the complexity of QOL assessment and the range of outcomes in this group. Increased time since surgery appears to be associated with an improvement in mental health ⁴⁾.

2016

A study included 6 patients with [internal auditory canal cavernous hemangioma](#). All patients presented with [sensorineural hearing loss](#) and [tinnitus](#), and 2 also suffered from [vertigo](#). Five patients reported a history of [hemifacial spasm](#) or [facial palsy](#): 3 had progressive facial weakness, 1 had a hemispasm, and 1 had a history of recovery from sudden facial paresis. All patients underwent CT and MRI to rule out intracanalicular [vestibular schwannomas](#) and facial nerve neuromas. Five patients had their tumors surgically removed, while 1 patient, who did not have facial problems, was followed up with a wait-and-scan approach.

All patients had a presurgical diagnosis of cavernous hemangioma of the IAC, which was confirmed pathologically in the 5 patients who underwent surgical removal of the tumor. The [translabyrinthine approach](#) was used to remove the tumor in 4 patients, while the [middle cranial fossa approach](#) was

used in the 1 patient who still had functional hearing. Tumors adhered to cranial nerves VII and/or VIII and were difficult to dissect from nerve sheaths during surgeries. Complete hearing loss occurred in all 5 patients. In 3 patients, the facial nerve could not be separated from the tumor, and primary end-to-end anastomosis was performed. Intact facial nerve preservation was achieved in 2 patients. Patients were followed up for at least 1 year after treatment, and MRI showed no evidence of tumor regrowth. All patients experienced some level of recovery in facial nerve function.

Cavernous hemangioma of the IAC can be diagnosed preoperatively through analysis of clinical features and [neuroimaging](#). Early surgical intervention may preserve the functional integrity of the facial nerve and provide a better outcome after nerve reconstruction. However, preservation of functional hearing may not be achieved, even with the retrosigmoid or middle cranial fossa approaches. The translabyrinthine approach seems to be the most appropriate approach overall, as the facial nerve can be easily located and reconstructed ⁵⁾.

2015

A total of 417 patients with 420 tumors were analyzed, 209 female (50.1%) and 208 male (49.9%). Mean age at diagnosis was 49.8 ± 13.2 years. The majority of the tumors were resected through a translabyrinthine approach (80.2%). Total tumor removal was achieved in 411 tumors (98.3%), and anatomic preservation of facial nerve in 404 (96.2%). Definitive facial nerve outcome was House-Brackmann grade I and II in 69.9%, and was significantly better in tumors under 20mm. Surgical complications included cerebrospinal fluid leakage in 3 patients (0.7%) and retroauricular subcutaneous collection in 16 (3.8%), 5 cases of meningitis (1.2%), 4 patients with intracranial bleeding (0.9%), and death in 3 patients (0.7%).

Surgery is the treatment of choice for vestibular schwannoma in the majority of patients. In our experience, the complication rate is very low and tumor size is the main factor influencing postoperative facial nerve function ⁶⁾.

2014

52 patients (2004-2013), outcomes included extent of resection, postoperative hearing, and facial nerve function. Extent of resection defined as gross total, near total, or subtotal were 7 (39%), 3 (17%), and 8 (44%) in 18 patients after retrosigmoid approaches, respectively, and 10 (29.5%), 9 (26.5%), and 15 (44%) for 34 patients after translabyrinthine approaches, respectively.

Hearing was preserved in 1 (20%) of 5 gross total, 0 of 2 near-total, and 1 (33%) of 3 subtotal resections. Good long-term facial nerve function (House-Brackmann grades of I and II) was achieved in 16 of 17 gross total (94%), 11 of 12 near-total (92%), and 21 of 23 subtotal (91%) resections. Long-term tumor control was 100% for gross total, 92% for near-total, and 83% for subtotal resections. Postoperative radiation therapy was delivered to 9 subtotal resection patients and 1 near-total resection patient. Follow-up averaged 33 months.

The findings support facial nerve preservation surgery in becoming the new standard for acoustic neuroma treatment. Maximizing resection and close postoperative radiographic follow-up enable early identification of tumors that will progress to radiosurgical treatment. This sequential approach can lead to combined optimal facial nerve function and effective tumor control rates ⁷⁾.

2012

A retrospective study of 1865 patients who underwent VS excision through the enlarged translabyrinthine approach between 1987 and 2009. Mean age was 50.39 years. Mean tumor size was 1.8 cm. Median follow-up was 5.7 years.

Total removal was achieved in 92.33% of cases; 143 patients had incomplete resection with evidence of regrowth in 8. In the 1742 previously untreated patients, anatomic preservation of facial nerve was achieved in 1661 cases (95.35%), and House-Brackmann grade I or II was reached in 1047 patients (59.87%). Facial nerve outcome was significantly better in tumors ≤ 20 mm. Surgical complications included cerebrospinal fluid leakage in 0.85%, meningitis in 0.10%, intracranial bleeding in 0.80%, non-VII/VIII cranial nerve palsy in 0.96%, cerebellar ataxia in 0.69%, and death in 0.10%. The technical modifications that evolved with increasing experience are described.

The enlarged translabyrinthine approach is a safe and effective approach for the removal of VS. The complication rate is very low and tumor size is still the main factor influencing postoperative facial nerve function with a cutoff point at around 20 mm ⁸⁾.

2010

123 patients who underwent translabyrinthine removal of a large vestibular schwannoma (>4 cm in the cerebellopontine angle, stage IV). All surgical and medical complications and facial function were reviewed, with a 1-year follow-up.

Mortality during the first year was 0.8% (one case of infarct of the anterior inferior cerebellar artery, fatal after 8 months). In all, 4.9% of patients underwent a second surgery (for delayed hemorrhage or cerebrospinal fluid leak) during the first months after removal of a large vestibular schwannoma; 3.2% of patients experienced definitive neurologic complications (one death, one cerebellar disturbance, and two cases of 10th cranial nerve palsy) ⁹⁾.

2005

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