Vestibular schwannoma diagnosis

- **Audiometry:** High-frequency sensorineural hearing loss
- **MRI with gadolinium contrast:** Gold standard; shows enhancing mass in the internal auditory canal or CPA
- **ABR (Auditory Brainstem Response):** May show delay in wave V latency

In the 1980s tests for cerebrospinal fluid protein, vestibular testing, and arteriography have been supplanted by modern audiometry with acoustic reflex testing, brain stem evoked responses, and computed tomography (CT). The various types of plain radiography are confirmed as an extremely useful screening modality. CT is insufficiently sensitive to serve as a primary screening procedure, but is a valuable confirmatory test [1)].

Vestibular schwannoma (VS) usually present the widening of internal auditory canal (IAC), and these bony changes are typically limited to IAC, not extend to temporal bone [2)].

Audiologic evaluation

Evaluation—should include pure tone audiometry and speech discrimination test (50/50 is considered serviceable hearing with 50 Db pure tone hearing and 50% speech discrimination).

The most common chief complaint in patients diagnosed with CPA tumors was asymmetrical hearing loss, with most frequent accompanying symptoms being tinnitus in patients with vestibular schwannoma (VS) and dizziness in those with other types of CPA tumor. The most frequent patterns of hearing loss were the descending type in patients with VS and the flat type in patients with non-VS tumors ($p < 0.05$). Pure tone thresholds tended to increase more in patients with VS than non-VS tumors according to tumor size, and pure tone averages were significantly higher in patients with VS than non-VS tumors of 11-25 mm in size ($p < 0.05$) [3)].

Neurological examination

Trigeminal nerve dysfunction

Trigeminal nerve, and facial nerve dysfunction are common preoperative findings.

Examination may show hypoesthesia in the most superficial part of the external auditory canal. In a population of 46 patients tested by a Schirmer test before radiosurgery, Tamura et al found that 41% of patients experienced some lacrimal deficit on the side of the tumor. more common at the time of presentation than facial weakness (about 10% of patients). A decrease in the corneal reflex generally occurs earlier and more commonly than documented facial hypoesthesia. Even though approximately 50–70% of individuals with large tumors have facial hypoesthesia on neurological examination, they are often unaware of it, and it is rarely the presenting symptom.

Facial nerve dysfunction

House-Brackmann score.

The HBS produced comparable results between different observers in patients with normal or only mildly impaired facial nerve function. Interobserver variability increased depending on the severity of facial nerve paresis. The results suggest that the HBS does not promote uniformity of reporting and comparison of outcomes in patients with moderate or severe facial nerve paresis [4].

CT scan

see Vestibular schwannoma CT scan

MRI

see Vestibular schwannoma magnetic resonance imaging

1)
Hart RG, Davenport J. Diagnosis of acoustic neuroma. Neurosurgery. 1981 Oct;9(4):450-63. Review. PubMed PMID: 7029342.
2)
Park SJ, Yang NR, Seo EK. Vestibular schwannoma atypically invading temporal bone. J Korean Neurosurg Soc. 2015 Apr;57(4):292-4. doi: 10.3340/jkns.2015.57.4.292. Epub 2015 Apr 24. PubMed PMID: 25932298; PubMed Central PMCID: PMC4414775.
3)
Kim SH, Lee SH, Choi SK, Lim YJ, Na SY, Yeo SG. Audiologic evaluation of vestibular schwannoma and other cerebellopontine angle tumors. Acta Otolaryngol. 2016 Feb;136(2):149-53. doi: 10.3109/00016489.2015.1100326. Epub 2015 Oct 19. PubMed PMID: 26479426.
4)
Scheller C, Wienke A, Tatagiba M, Gharabaghi A, Ramina KF, Scheller K, Prell J, Zenk J, Ganslandt O, Bischoff B, Matthies C, Westermaier T, Antoniadis G, Pedro MT, Rohde V, von Eckardstein K, Kretschmer T, Kornhuber M, Barker FG 2nd, Strauss C. Interobserver variability of the House-Brackmann facial nerve grading system for the analysis of a randomized multi-center phase III trial. Acta Neurochir (Wien). 2017 Apr;159(4):733-738. doi: 10.1007/s00701-017-3109-0. Epub 2017 Feb 10. PubMed PMID: 28188418.