Vestibular schwannoma clinical features

- **Unilateral sensorineural hearing loss** (most common symptom)
- **Tinnitus**
- **Unsteadiness or imbalance** (usually mild)
- **Vertigo** (less common)
- **Facial numbness or paresthesia** (compression of CN V)
- **Headache or hydrocephalus** (in large tumors)

3 most common early symptoms (clinical triad): hearing loss (insidious and progressive), tinnitus (high pitched) and disequilibrium (true vertigo is uncommon)

Hearing Loss

Vestibular schwannoma hearing loss.

Tinnitus

see Vestibular schwannoma tinnitus.

Vertigo

Vertigo and disequilibrium are uncommon presenting symptoms among patients with these tumors. Rotational vertigo (the illusion of movement or falling) is more common when tumors are small. On the other hand, dysequilibrium (a sense of unsteadiness or imbalance) appears to be more common in larger tumors. Overall, approximately 40–50% of patients with vestibular schwannomas report some balance disturbance. However, such disturbance is the presenting symptom in less than 10% of patients. The gradual reduction of vestibular function in general is well compensated for by central mechanisms. Headaches are present in 50–60% of patients at the time of diagnosis, but fewer than 10% of patients have headache as their presenting symptom. Headache appears to become more common as tumor size increases and is a prominent feature in patients who develop hydrocephalus associated with a large tumor. Facial numbness occurs in about 25% of patients and isphenomenon occurring in 5–10% of patients, the development of facial weakness associated with a small or medium-size tumor should raise suspicion that the diagnosis is not compatible with a vestibular schwannoma. Other diagnoses, such as facial neuroma, meningioma, epidermoid tumor, arteriovenous malformation (AVM) or lipoma should be excluded. Larger tumors can obstruct the flow of cerebrospinal fluid through the ventricular system. In the early decades of the 20th century, 75% of patients presented with hydrocephalus. Clinical study of the nervus intermedius component often shows dysfunction. If specifically asked, the patient will often notice a change in lacrimation with an eye dryness that can be documented by a Schirmer test. Patients may report dysguesia with a feeling of a metallic taste.

http://www.irsa.org/an%20guideline.pdf

Dizziness

Dizziness is a frequent complaint in patients with vestibular schwannoma (VS). An abnormal vestibulo-ocular reflex (VOR) can explain this dizziness in patients with VS. The video Head impulse test (vHIT) offers a chance to describe specifically the VOR findings in such patients. : Fifty consecutive patients with VS were classified in accordance with the morphology of the VOR; gain, covert saccade, and overt saccade were analyzed both in the affected side and in the healthy side. For all patients, caloric tests were performed. All patients were tested before surgery.

Caloric response was normal in 31 of 50 patients. The video Head impulse test was abnormal in 45 of 50 patients. For the affected side, low horizontal VOR gain was found in 27 of 50 patients, covert saccade was observed in 37 of 50, and overt saccade was observed in 26 of 50. In the healthy side, vHIT was abnormal in 29 of 50 patients, with a low gain in four of 50, covert saccade in seven of 50, and overt saccade in 23 of 50. In VS, gain for the affected side is not associated with caloric response, but gain for the affected side is associated with gain in the healthy side. Covert and overt saccade for the affected side is associated with gain for the affected side. In the healthy side, overt saccade is associated with low gain for the affected side.

Video head impulse test improves the vestibular testing before surgery in patients with VS and should be included in the usual clinical tests for these patients [1)].

Cognitive Performance

A cross-sectional observational study recruited 75 patients with an untreated VS and 60 age-, sex-, and education-matched healthy control subjects. A set of neuropsychological tests were administered to each participant.

Compared with the matched controls, patients with VS exhibited impaired general cognitive function, memory, psychomotor speed, visuospatial ability, attention and processing speed, and executive function. The subgroup analyses displayed that patients with severe-to-profound unilateral hearing loss were more cognitively impaired than patients with no-to-moderate unilateral hearing loss. In addition, patients with right-sided VS scored worse than those with left-sided VS on tests of memory, attention and processing speed, and executive function. No differences were observed in cognitive performance between patients with or without brainstem compression and those with or without tinnitus. We also found that worse hearing and longer hearing loss duration were associated with poorer cognitive performance in patients with VS.

The findings of this study provide evidence for cognitive impairment in patients with untreated VS. It can thus be said that including cognitive assessment in the routine clinical management of patients with VS may facilitate more appropriate clinical decision-making and improve patient's quality of life [2)]

Neuropsychological tests were performed between 64 patients with AN and 67 healthy controls. Then, using resting-state fMRI, the possible mechanisms of cognitive decline in AN patients were further explored by calculating the amplitude of low-frequency fluctuations (ALFF) and regional homogeneity (ReHo). Furthermore, using high-resolution T1-weighted images, voxel-based morphometry (VBM) was

adopted to investigate the changes in gray matter volume (GMV) and white matter volume (WMV) in AN patients.

Results: AN patients had worse cognitive performance than those in the healthy controls. Relative to the healthy individuals, the mALFF value was increased in the right caudate nucleus of the patients with left-sided AN (LAN) and the right rectus region of the patients with right-sided AN (RAN). The mReHo values of the bilateral superior frontal gyrus and middle frontal gyrus were decreased in LAN patients. Compared with healthy subjects, the GMV values were elevated in the left fusiform gyrus, parahippocampal gyrus, calcarine gyrus, and cuneus in LAN patients as well as in the right fusiform gyrus and parahippocampal gyrus in RAN patients. Meanwhile, the WMV values showed elevations in the bilateral putamen, left rectal gyrus, and thalamus in LAN patients.

Cognitive dysfunction occurs in AN patients. Cognitive decline in AN patients activates functional activity in some brain regions, thereby compensating for cognition decline. Additionally, the ReHo values were reduced in the frontal lobe in LAN patients, and the connectivity was decreased, affecting the functional differentiation and integration of the brain, which may be associated with the decline in cognitive function. Lateralized brain reorganization induced by the unilateral hearing loss was presented in AN patients. LAN caused a more significant interference effect on the brain while RAN patients showed more stable cerebral cortices. Altogether, in responding to cognition decline in AN patients, structural reorganization occurs, and compensative increases in cognitive-related brain regions, which compensates for cognitive impairment [3].

1)
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2)
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3)
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