Vestibular schwannoma magnetic resonance imaging

- Intralabyrinthine schwannoma masking as Meniere's disease
- Whole Body-MRI assessment of peripheral lesions in patients with NF2-related schwannomatosis on systemic bevacizumab
- Cochlear signal intensity changes in vestibular schwannoma: a balanced fast field-echo MRI study
- Utility and Challenges of Imaging in Peripheral Vestibular Disorder Diagnosis: A Narrative Review
- The implementation of artificial intelligence in serial monitoring of post gamma knife vestibular schwannomas: A pilot study
- The Classification of Vestibular Schwannoma (VS) and Cerebellopontine Angle Meningioma (CPAM) Based on Multimodal Magnetic Resonance Imaging Analysis
- Sex-specific difference in treatment success/failure after vestibular schwannoma treatment
- Radiomics for Growth Prediction of Vestibular Schwannomas in Neurofibromatosis Type 2

see Vestibular schwannoma volume.

The T2-weighted sequences are fairly accurate in measuring vestibular schwannoma size and identifying growth if one keeps in mind the caveats associated with the tumour characteristics or location [1)].

T1

slightly hypointense cf. adjacent brain (63%)

isointense cf. adjacent brain (37%)

may contain hypointense cystic areas

T2

heterogeneously hyperintense cf. to adjacent brain

cystic areas fluid intensity

may have associated peritumoural arachnoid cysts

T1 C+ (Gd) contrast enhancement is vivid but heterogeneous in larger tumours Post-op MRI

Linear enhancement may not indicate tumour, but if there is nodular enhancement suspect tumour recurrence (needs follow up MRI).

see Peritumoral edema in vestibular schwannoma.

Incidental Findings On Magnetic Resonance Imaging Of The Internal Auditory Meatus For Vestibular Schwannoma

[2)]

Screening

To find a more objective method of assessing which patients should be screened for a vestibular schwannoma (VS) with magnetic resonance imaging (MRI) using a deep-learning algorithm to assess clinical and audiometric data.

Clinical and audiometric data were collected for 592 patients who received an audiogram between January 2015 and 2020 at Duke University Health Center with and without VS confirmed by MRI. These data were analyzed using a deep learning-based analysis to determine if the need for MRI screening could be assessed more objectively with adequate sensitivity and specificity.

Results: Patients with VS showed slightly elevated, but not statistically significant, mean thresholds compared to those without. Tinnitus, gradual hearing loss, and aural fullness were more common in patients with VS. Of these, only the presence of tinnitus was statistically significant. Several machine learning algorithms were used to incorporate and model the collected clinical and audiometric data, but none were able to distinguish ears with and without confirmed VS. When tumor size was taken into account the analysis was still unable to distinguish a difference.

Using audiometric and clinical data, deep learning-based analyses failed to produce an adequately sensitive and specific model for the detection of patients with VS. This suggests that a specific pattern of audiometric asymmetry and clinical symptoms may not necessarily be predictive of the presence/absence of VS to a level that clinicians would be comfortable forgoing an MRI [3)].

[1)]
Forgues M, Mehta R, Anderson D, Morel C, Miller L, Sevy A, Son L, Arriaga M. Non-contrast magnetic resonance imaging for monitoring patients with acoustic neuroma. J Laryngol Otol. 2018 Aug 17:1-6. doi: 10.1017/S0022215118001342. [Epub ahead of print] PubMed PMID: 30117408.
[2)]
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[3)]
Kortebein S, Gu S, Dai K, Zhao E, Riska K, Kaylie D, Hoa M. MRI Screening in Vestibular Schwannoma: A Deep Learning-based Analysis of Clinical and Audiometric Data. Otol Neurotol Open. 2023 Mar 9;3(1):e028. doi: 10.1097/ONO.0000000000000028. PMID: 38516318; PMCID: PMC10950172.