

Abstract

Objective: Investigate the relationship between word recognition score (WRS) and pure tone average (PTA) after hearing preservation surgery for vestibular schwannomas (VS) as well as evaluate the consistency of hearing classification systems.

Study design: A retrospective chart review was performed.

Setting: This study included patients from a single academic tertiary referral hospital.

Patients: Patients with VS and serviceable hearing who underwent hearing preservation surgery 2014-2023. Patients excluded for neurofibromatosis 2 and lacking pre/postop audiograms.

Interventions: All patients underwent resection of vestibular schwannoma.

Main outcome measures: Pre/postop WRS, PTA, and AAO-HNS, Gardner-Robertson (GR), and WRS Class (WRSC) hearing classifications.

Results: Seventy-five patients were included. Average preop and postop PTA and WRS were 26 ± 12 dB, 79 ± 39 dB, $92 \pm 12\%$, and $33 \pm 43\%$, respectively. Postop PTAs were distributed along the complete testable decibel range, while the postop WRS displayed a bimodal distribution, with WRS $>50\%$ or $<20\%$. Worsening intraop ABR changes were significantly associated with poorer hearing outcomes ($p = 0.005$). With increasing Koos grades, intraop ABRs were significantly more likely to exhibit changes ($p = 0.005$). AAO-HNS and GR classified patients nearly identically, while the WRSC resulted in more class I and fewer class II. The cutoff of serviceable hearing was comparable across all classification systems.

Conclusions: Effects on the brainstem component of Koos 3-4 tumors may particularly disturb speech processing. This effect seems amplified by surgical dissection.

AAO-HNS, GR, and WRSC hearing classifications are comparable in describing serviceable hearing in vestibular schwannoma patients.