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Introduction: Otosclerosis is a progressive disorder of abnormal temporal bone remodeling, often causing conductive hearing loss. Stapes surgery restores middle ear mechanics and achieves success rates above 90%. However, a subset of patients experience unchanged or worsened hearing. While prognostic factors for successful outcomes have been studied, risk factors for unsuccessful surgery remain unclear.

Material & Methods: This nationwide, register-based study analyzed data from the Swedish Quality Register for Otosclerosis Surgery. Adults (≥ 18 years) undergoing primary stapes surgery between 2009–2020 with complete preoperative and one year postoperative audiometry were included. Unchanged or worse hearing was defined by four criteria: (1) unchanged or worse air conduction (AC) pure-tone average (PTA₄, 0.5–4 kHz) with improvement ≤ 5 dB, (2) worsened bone conduction (BC) PTA₄ (≥ 10 dB deterioration), (3) unchanged or worse air-bone gap (ABG) PTA₄ (≥ 0 dB), and (4) worsened high-frequency PTA₃ (4–8 kHz, ≥ 15 dB deterioration). Logistic regression identified risk factors.

Results: A total of 1813 patients were included. Unchanged or worsened hearing occurred in 7%, while 93% improved. The most common causes were unchanged or worse AC PTA₄ and high-frequency deterioration. Multivariate analysis showed increased risk with preoperative ABG ≤ 23.75 dB (OR 2.3), AC ≤ 45 dB HL (OR 2.1), age ≥ 55 years (OR 2.1–2.3), and stapedectomy (OR 3.5).

Conclusions: Although stapes surgery generally provides good outcomes, 7% of patients experience unchanged or worsened hearing. Smaller preoperative ABG, better baseline AC, older age, and stapedectomy are significant risk factors, underscoring the importance of patient selection and counseling to maintain realistic expectations.