

Stapedotomy instead of cochlear implantation in otosclerosis hearing rehabilitation

Sara Enghag MD 1, Ylva Dahlin Redfors MD 2. PhD, Lars Lundman MD. PhD 3, Karin Strömbäck MD. PhD 1

1 Dept. of Otorhinolaryngology, Uppsala Univ. Hospital. 2 Dept. of Otorhinolaryngology Sahlgrenska Univ Hospital. 3 Dept. of Otorhinolaryngology, Central Hospital Karlstad. Sweden

INTRODUCTION

The hearing loss in otosclerosis patients can become severe to a degree, where the patients hearing fulfill the criteria for cochlear implantation. The non-measurable conductive part of the hearing loss however, can in many cases be reduced by successful stapes surgery, which also facilitates the hearing rehabilitation with conventional hearing aids.

AIM

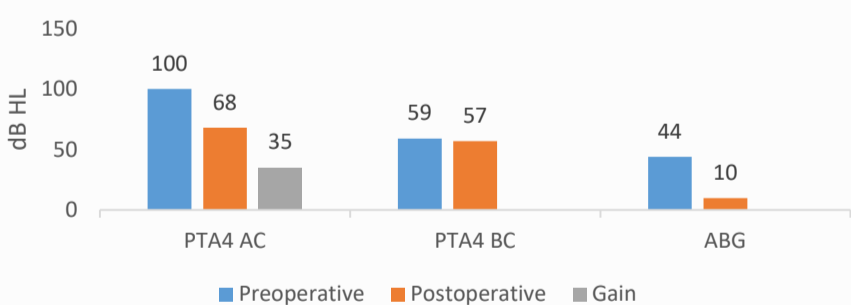
The aim of the study was to evaluate the hearing outcome, use of hearing aid and patient satisfaction in patients with severe hearing loss undergoing stapes surgery.

MATERIAL AND METHODS

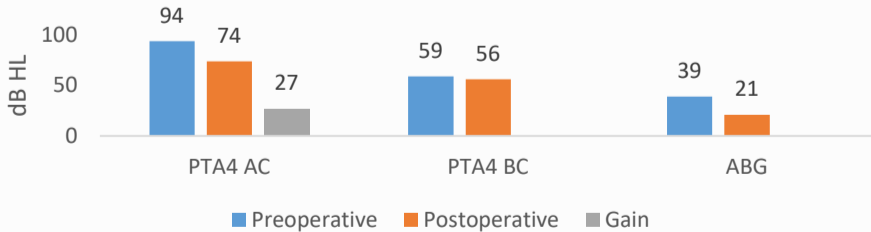
Patients with a preoperative air conduction (AC) pure tone average (PTA) ≥ 70 dB at the frequencies 0.5, 1, 2 and 4 kHz bilaterally were identified from the Swedish Quality register for Otosclerosis, SQOS and included in the study. The AC threshold level 70 dB corresponds to the indication for CI according to the National guidelines of the Swedish National Board of Health and Welfare. The surgeries were performed during 2013-2016. 80% of all stapes surgeries are reported in the SQOS.

Patients were registered with three separate documents into the SQOS database. Document 1 reports age, gender, audiometry, previous surgery, use of hearing aid and eventual tinnitus was filled in by the surgeon. Document 2 reports hearing outcome and complication one year after surgery. Document 3 is a patient questionnaire reporting postoperative patient satisfaction.

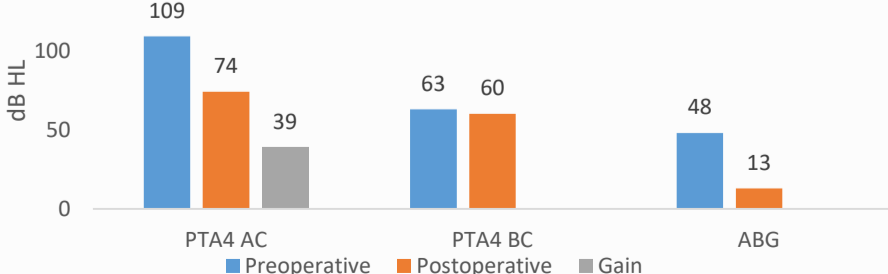
Median preoperative and postoperative hearing levels, Group I



Median preoperative and postoperative hearing levels, Group II



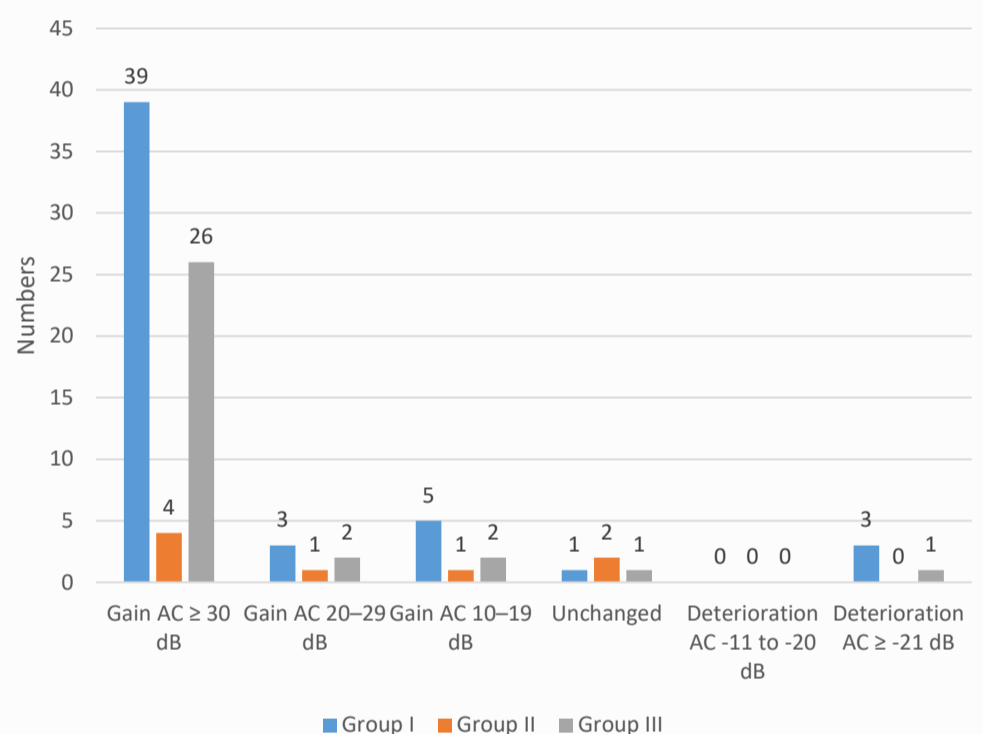
Median preoperative and postoperative hearing levels, Group III



RESULTS

Sixty-seven cases (64 patients) out of 1330 met the inclusion criteria and were evaluated. Twenty-five patients (39%) had previous surgery on the contralateral ear before 2013. Primary surgery was performed in 57 cases (85%) and revision surgeries in 10 cases (15%). Of the 67 cases in which surgical data were compiled, 59 had audiological data available one year after surgery. We present the results in three groups, Group I primary surgery, group II revision surgery and group III preoperative PTA₄ AC ≥ 100 dB HL. Postoperatively a better hearing outcome was reported by 84% of the patients. One case became deaf and another case with obliterative otosclerosis could not be fitted with conventional hearing aids. Both patients were implanted with a CI.

Change in air conduction



Subjective hearing outcome. "How do you experience your hearing on the operated ear?"

Patient group	N	Much better/better	Unchanged	Much worse/worse
All surgeries	45	38 (84%)	3 (7%)	4 (9%)
Group I	41	35 (85%)	3 (7%)	3 (7%)
Group II	4	3 (75%)	0	1 (25%)
Group III	22	21 (95%)	0	1 (5%)

CONCLUSION

The majority of patients had ≥ 30 dB gain in air conduction and experienced a better hearing outcome. Surgery of the stapes footplate, with a stapedotomy is a less invasive surgical procedure compared to a cochlear implantation. Stapes surgery preserves the acoustic hearing, meaning better chances of benefitting from music postoperatively compared to patients operated with a CI.