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“Hot” vs “Cold” endoscopic stapes surgery: a matched case-control study

Cecilia Lotto¹⁾, Giulia Molinari^{1,2)}, Ignacio Javier Fernandez^{1,2)}, Claudio Melchiorri³⁾, Marella Reale³⁾, Marco Bonali³⁾, Livio Presutti^{1,2)}, Daniela Lucidi³⁾, Arianna Burato¹⁾

¹⁾ Department of Otolaryngology - Head and Neck Surgery, IRCCS Azienda Ospedaliero-Universitaria di Bologna, Policlinico S.Orsola-Malpighi, Bologna, Italy

²⁾ Department of Specialistic, Diagnostic and Experimental Medicine, Alma Mater Studiorum University, Bologna, Italy

³⁾ Department of Otolaryngology - Head and Neck Surgery, Azienda Ospedaliero-Universitaria Policlinico di Modena, University of Modena and Reggio Emilia, Italy

Objective: To compare hearing results and complication rates between two groups of patients operated on by endoscopic stapes surgery (ESS) for otosclerosis, either with CO2 fiber laser or microdrill.

Study Design: Case-control study

Setting: Tertiary referral center

Methods: All consecutive cases of CO2 fiber laser ESS operated at a single center during the period 2017-2020 were enrolled as case group and matched to a control group of patients operated by traditional technique in the same time span, according to year of surgery, preoperative mean air-bone gap, sex and age. Audiological data from preoperative and postoperative examinations and complication rates were compared.

Results: 46 cases were included. Mean operative time was significantly longer in the laser cohort (65 minutes) than in the drill one (45 minutes) ($p=0.003$). Similar results were found in the two groups regarding the mean postoperative BC-PTA. The high-frequency bone conduction resulted significantly higher in the laser group ($p=0.002$), suggesting an overclosure effect in the laser group. Consistently, a significant improvement of the BC-PTA threshold at 2000 Hz postoperatively was found in the laser group ($p=0.034$). The postoperative AC-PTA significantly improved in both groups at all frequencies ($p<0.05$), except for the AC threshold at 8 kHz. Similar rates of complications were found in the two groups.

Conclusion: This study is the first to compare hearing results and complications between CO2 fiber laser and microdrill in ESS. Our results demonstrated similar functional outcomes between the two groups, confirming ESS as safe and effective, regardless of the technique used.