Stapedotomy: Is the Color of the Footplate Important in the Choice of the Type of Perforator?

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Objective: To evaluate the influence of the color of footplate in the choice of the type of perforator.

Study Design: Prospective study. Level of Evidence 1b.

Settings: Single hospital study in Avellino, Italy.

Subjects and Methods: From the first of September 2008 to the 30th of June 2009, we considered 83 patients affected by otosclerosis. Patients were divided into 2 groups under footplate perforator used. In the group A, manual perforators (the more traumatic drills) were used. In group B, CO2 laser (the less traumatic drill) was used. The 2 groups under the color of visible portion of the footplate before removing the stapes superstructure were divided in 2 subgroups. Group IA includes 33 blue footplates and Group IIA 10 white footplates. Group IB includes 30 blue footplates and Group IIB 10 white footplates.

We estimated whether there is statistical correlation between type of perforator, incidence of footplate complications, and color of footplate.

Results: In group IA, we had 0 complications. In group IB, we had 0 complications. In group IIA, we had 7 complications. In group IIB, we had 2 complications. Comparison of incidence of footplate complications showed no statistical significance between group IA and IB and statistical significance between group IIA and IIB.

Conclusion: The footplate color is important in the choice of the type of perforator. Key Words: Footplate complications—Hand drills—Laser stapedotomy—Otosclerosis.


Since the introduction of stapedotomy, complete footplate fractures (from the hole to the annular ligament) and floating footplate were feared (1,2). This is because they increase the risk of inner ear trauma and cause the failure of the surgical technique, forcing the surgeon to convert the stapedotomy into stapedectomy. In the current literature, these complications are ascribed to the use of mechanical means (hand and electric drills) (3). Many authors have reported that the laser stapedotomy allows to create a precise hole in the footplate, reducing the possibility of fracture and luxation of the footplate (3–11).

Malafronte et al. (12) has proposed a new and simplified macroscopic classification of otosclerosis (blue otosclerosis, white otosclerosis, and obliterative otosclerosis) based on the appearance of the footplate before removing the stapes superstructure.

In the blue otosclerosis, the visible portion of the footplate, before removing the stapes superstructure, preserves the natural blue color in all its points. It represents approximately 72% of otosclerosis. In the white otosclerosis, the visible portion of the footplate, before removing the stapes superstructure, seems white in all or in most of its extension. It represents approximately 23% of otosclerosis. In the obliterative otosclerosis, the footplate is not visible as the massive otospongiotic focus covers the footplate, completely making it indistinguishable. It represents approximately 5% of otosclerosis.

The aim of this study is to demonstrate that the color variations of footplate are important in the choice of the type of perforator.

MATERIALS AND METHODS

Participants and Surgical Procedures

This study was started on the first of September 2008 and ended on June 2009 when the statistical data reached significance. Eighty-nine patients affected by otosclerosis underwent surgery. Two revision procedures (2.2%) and 4 obliterative otosclerosis(4.4%) were excluded from the study because we do not use the laser in these cases. Finally, we considered 83 patients. Female subjects were 62% of cases and male subjects 38%. The mean age was 44 years. The otosclerosis was bilateral in 86.7% of cases.

All patients underwent: impedance audiometry, pure tone audiometry, and speech audiometry. All patients included in the study had conductive or mixed hearing loss with air threshold major or equal than 45 dB. Stapedial reflexes were absent in all patients.