

Speech Discrimination and Impedance Audiometry in Stapedectomized Patients *

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Middle ear surgery for otosclerosis has in the past been evaluated primarily in terms of pre-operative and post-operative pure tone results. The amount of reduction in the air-bone gap by surgery has been used as an indicator of success. It has been only in the last few years that speech discrimination scores have been used in the evaluation of stapes surgery, primarily because speech discrimination was thought to be a cochlear function unaltered by the surgical restoration of ossicular chain. However, the recent literature dealing with the effects of stapes surgery on speech discrimination score suggests that in some otosclerotic cases a decrease in discrimination score may occur. From clinical experience it had been observed that majority of patients report "better discrimination" after surgery, which was in contradiction with the available literature.

There was no literature regarding the impedance audiometric findings following stapedectomy.

Hence the present study attempted to find out :

(1) If there was any change in speech discrimination scores one-week and 3-month following stapedectomy ; (2) if

there was any relationship between the subjective opinion about the speech discrimination ability and the objectively obtained discrimination scores after surgery ; (3) if there was any relationship between the change in AC slope and the change in discrimination score following surgery ; and (4) if there was any change in post-operative impedance audiometric findings.

In order to find out these, the study was planned as follows : Pre-operative and one-week post-operative audiometric (pure tone, speech and impedance) findings were collected from the surgically confirmed otosclerotics A.I.I.S.H. case files. Later those 20 subjects were called for a 3-month post-operative re-evaluation, when the post-operative otologic history and the subjective opinion about the change in speech discrimination ability were collected by using a questionnaire. The subjects then underwent pure tone, speech and impedance audiometric evaluations.

Significant difference between the means, ϕ coefficient and χ^2 and product moment correlation were used to analyze the obtained pre-operative, one-week and 3-month post-operative data.

The *results* of the study were :

(1) There was no significant difference between the speech discrimination

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scores obtained pre-operatively and one-week post-operatively.

- (2) There was a significant difference between the speech discrimination scores obtained pre-operatively and 3-month post-operatively.
- (3) There was a significant difference between the speech discrimination scores obtained one-week and 3-month post-operatively.
- (4) There was no significant relationship between the subjective opinion of the subjects about the change in speech discrimination ability and the change in the objectively obtained discrimination scores, one-week and 3-months post-operatively.
- (5) There was no significant relationship between the change in speech discrimination score (both in amount and direction) and the change in AC slope, following stapedectomy.
- (6) There was a significant difference between pre-operative and 3-month post-operative impedance audiometric results (except reflexometry).

The following *conclusions* were drawn :

- (1) The change in speech discrimination scores, observed one-week post-operatively, is not significant ; whereas there is a significant improvement in speech discrimination scores 3-month post-operatively (even when the 3-month and one-week post-operative data were compared).
- (2) The relationship, between the subjective opinion about the change in speech discrimination ability and the

change in the objectively obtained speech discrimination score upto 3-month following surgery, is not significant.

- (3) The relationship between the change in AC slope and the change in speech discrimination scores (both in amount and direction), following stapedectomy, is not significant.
- (4) 3-Month post-operatively, the impedance audiometric results (except reflexometry) will be within the normal range.

Limitations

- (1) The testers in the 3 different conditions (*i.e.*, pre-operative, one-week and 3-months post-operative) were different.
- (2) A control group for speech discrimination testing could not be used due to lack of time.
- (3) Cases in whom the severed stapedial tendon was placed on the teflon prosthesis and cases with advanced otosclerosis were not included for the study.
- (4) English PB word lists which have been standardized for Indians could not be used for the study because of diversity of the languages of the subjects.

Implications

- (1) The study emphasizes the importance of speech discrimination testing for the stapedectomized patients, in order

to find out cochlear reserve and the improvement or reduction of hearing in practical situation.

- (2) The study also indicates the importance of impedance audiometry for the 3-month post-operative otosclerotics in order to find out the middle ear integrity after stapedectomy.

Recommendations for Further Research

The present study provides scope for further research in the same area ; such as :

- (1) To select a larger sample of stapedectomized cases and find out whether there is any difference between

pre-operative and post-operative discrimination scores.

- (2) The same subjects may be called for a 6-month and 1-year post-operative follow-up and the change in speech discrimination scores can be found out.
- (3) To find out whether there is any difference between pre-operative and post-operative discrimination scores in cases with far advanced otosclerosis.
- (4) The reflexometry can be studied in those cases where the severed stapedial tendon end has been placed on the teflon prosthesis.