

EFFECTS OF TONSILLECTOMY ON VOICE ASSESSMENT

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ABSTRACT

Removal of lymphoid tissue mass (Tonsils) from the vocal tracts between the vocal folds and lips may cause a change in voice quality postoperatively. This study was conducted to determine the effect of tonsillectomy on voice in terms of its quality under the Category: Hoarse, Harsh and Breathly. This study was done on 50 patients (32 females and 18 males) who underwent tonsillectomy for chronic tonsillitis during a period from January 2004 to February 2005 in a Tertiary Care Centre. The preoperative and postoperative voice samples of vowels /a/, /i/ and /u/ were recorded in a computer. The recordings were analyzed using a computerised programme, Dr Speech Software Version 4 (Tiger DRS, Inc. Seattle, USA). The patients reported that they did not perceive any change in his/her voice after surgery. The vocal assessment between the preoperative, first postoperative followup and second postoperative follow-up for all the three vowels /a/,/i/ and /u/ were not statistically significant. As a conclusion, tonsillectomy do not appear to change the acoustic features of vowels remarkably, but in professional voice users they should be warned for any possible changes in voice after surgery.

KEYWORDS

Tonsillectomy, Hoarse, Harsh, Breathly, Acoustic Analysis.

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INTRODUCTION

Tonsillectomy is one of the most performed surgeries worldwide to treat upper respiratory tract infections and/or obstructive diseases. Surgeons performing an appreciable number of tonsillectomy commonly observed and alteration in the voice at a week's postoperative visit.

The removal of tonsils can modify the shape of vocal tract and it is assumed that the acoustic features of voice may change after tonsillectomy. But the question is whether these changes in the acoustic features of vowels are minimal or do they have effects on professional speakers and singers, since any change in voice may interfere with their professional jobs.

Presently acoustic analysis of voice is one of the most attractive methods of assessing the phonatory functions providing the quantitative and qualitative data. In this study, the effects of tonsillectomy on the voice assessment is analyzed.

MATERIAL AND METHODS

This prospective study was carried out on 50 patients (32 females and 18 males), above 5 years of age. All of them underwent tonsillectomy for having recurrent episodes of tonsillitis. All children below 5 years, patients with congenital anatomical defects of nose and palate and change of voice during puberty were excluded from the study. The patients were required to sustain the vowels /a/, /i/ and /u/ and their voices were recorded preoperatively one day before the surgery and postoperatively one week after the surgery and

one month after the surgery.

These recordings were made in a computer and analyzed by computerized Dr Speech Software Version 4 (Tiger DRS, Inc. Seattle, USA).

The difference between the mean scores of preoperative, postoperative stage I and postoperative stage II for all the three vowels /a/, /i/ and /u/ under the category: Hoarse, Harsh and Breathly were studied and statistically analyzed.

RESULTS

In the present study, maximum cases of tonsillectomy were seen in the age group of 5-11 years accounting for 32 percent of the total cases. The minimum cases of tonsillectomy were seen in the age groups of 19-25 years accounting for 18 percent only.

Results for the vocal assessment between the preoperative and postoperative stage I and postoperative stage II for the three vowels /a/, /i/ and /u/ are shown in the tables mentioned below.

Voice Quality	Mean Scores for Vowel /a/		
	Preoperative	Postoperative I	Post operative II
Hoarse	1.2	1.7	0.9
Harsh	0.8	1.3	0.8
Breathly	1.7	1.6	1.3

Table 1: Showing the vocal assessment between preoperative, postoperative stage I and postoperative stage II (for vowel /a/)

Hoarse

The difference in the mean values between one stage to another stage was not statistically significant ($p>0.05$).

Harsh

The difference in the mean values between one stage to another stage was not statistically significant ($p>0.05$).

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Breathy

The difference in the mean values between one stage to another stage was not statistically significant (p>0.05).

Voice Quality	Mean Scores for Vowel /i/		
	Preoperative	Postoperative I	Postoperative II
Hoarse	2	1.7	1.6
Harsh	1.4	1.5	1.5
Breathy	2.4	2.3	2.0

Table 2: Showing the vocal assessment between the preoperative, postoperative stage I and postoperative stage II (for vowel /i/)

Hoarse

The difference in the mean values between one stage to other stage was not statistically significant (p >0.05).

Harsh

The difference in the mean values between one stage to other stage was not statistically significant (p >0.05).

Breathy

The difference in the mean values between one stage to other stage was not statistically significant (p >0.05).

Voice Quality	Mean Scores for Vowel /u/		
	Preoperative	Postoperative I	Postoperative II
Hoarse	2.2	2.4	2.0
Harsh	2.0	2.2	1.8
Breathy	2.9	2.6	2.4

Table 3: Showing the vocal assessment between the preoperative, postoperative stage I and postoperative stage II (for vowel /u/)

Hoarse

The difference in the mean values between one stage to other stage was not statistically significant (p>0.05).

Harsh

The difference in the mean values between one stage to other stage was not statistically significant (p>0.05).

Breathy

The difference in the mean values between one stage to other stage was not statistically significant (p>0.05).

DISCUSSION

The effects of tonsillectomy on voice have not been studied extensively in terms of voice quality, other than its effect on nasalance.^(1,2) Few studies have examined voice changes in post tonsillectomy patients. In general minimal changes were found.^(3,4,5,6)

Tonsillectomy can modify the shape of the vocal tract by enlarging the resonating chamber and by altering the formant frequencies or by altering conformation of tonsillar fossa.^(1,4) With respect to the supralaryngeal factors if extirpation of soft tissue from the oropharynx altered the anatomy of the supralaryngeal acoustic transmission pathway and possibly the dynamics of physiologic function, the acoustic measures related to vocal tract resonance could be changed.⁽¹⁾

With regard to vocal assessment in our study of vowels /a/, /i/ and /u/ under the category: Hoarse, Harsh and Breathy; the results were found to be not statistically significant. Saida et al.⁽³⁾ reported that tonsillectomy did not appear to change the acoustic features of vowels remarkably.

Hori et al.⁽⁴⁾ noted that the changes in articulation were considered to be negligible in clinical practice. Chuma et al.⁽¹⁾ reported that it had only minimal impact on quantitative and qualitative aspect of vocal function.

Antonio et al.⁽⁷⁾ reported that the perceptual speech characteristics improved or remain the same for most variables. However, rating of voice quality (Pitch and breathiness) were significantly improved after surgery.

Patients may be advised the possibility of voice change after surgery, especially if they are professional voice users. According to Behrman et al.⁽⁸⁾ one-fifth of patient’s voice have improved after surgery and none thought the voice to be worse.

A retrospective study done by Jarboe et al.⁽⁹⁾ stated that the patients voices were not impaired after tonsillectomy. The gathered information in his study also suggests that tonsillectomy can be performed safely in vocal performing artists despite their specialized requirements for pharyngeal function. Ilk, Eroglu.⁽¹⁰⁾ and his colleagues reported the changes were minimal and have little effects on acoustic parameters except for the professional speakers and singers. Therefore, the changes in voice quality were considered to be negligible, although it seemed to be a problem that cannot be disregarded.

CONCLUSION

From the present study it can be inferred that the situation of vocal analysis and assessment for the vowels /a/, /i/ and /u/ under the categories Hoarse, Harsh and Breathy remain more or less the same during the preoperative stage, first postoperative follow-up and the second post-operative follow-up.

These results demonstrate that tonsillectomy did not appear to change the acoustic features of vowels remarkably; however, it is advisable to warn the professional voice users for possible subtle changes in voice parameters after surgery.

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