Does Over-adduction of the Healthy Vocal Fold really Compensate Vocal Function in Patients with Unilateral Vocal Fold Paralysis?

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INTRODUCTION

Adduction of the vocal fold on the unaffected side over the midline (over-adduction) during phonation is thought to improve vocal function in patients with unilateral vocal fold paralysis (UVFP) by decreasing the size of the glottal gap. However, whether such over-adduction of the unaffected vocal fold really plays a role in compensating vocal function in patients with UVFP remains to be clarified.

In the present study, three-dimensional (3D) endoscopic images using multislice helical computed tomography (CT) were used to evaluate the presence of over-adduction.

The purposes of the present study are (1) to determine whether over-adduction of the unaffected vocal fold contributes to improvement in vocal function, and (2) to examine the relationship between over-adduction and the clinical profile of patients with UVFP.

SUBJECTS AND METHODS

In total, 101 consecutive patients who consulted our outpatient clinic for evaluation of breathy dysphonia due to UVFP between August 1999 and November 2009 were included in the study. Those with the following exclusion criteria were not included: paresis of the vocal fold, past history of voice therapy and of phonosurgical treatment, or unknown onset time. Clinical data (age, etiology, and duration of paralysis) were reviewed from the medical records.

Results: Over-adduction was observed in 47 patients. Their MPT and MFR values were 4.9 ± 2.9 s (mean ± standard deviation) and 653 ± 504 mL/s, respectively. The remaining 54 did not show over-adduction. Their MPT and MFR values were 4.7 ± 2.67 s and 574 ± 384 mL/s, respectively. There were no significant differences in MPT or MFR values between the two groups. No apparent differences in clinical characteristics (age, etiology, and duration of paralysis) between the two groups were found. Of the 47 patients with over-adduction, nine showed closure of the posterior glottis during phonation. However, their vocal function was not significantly different from that of 38 patients with a posterior glottal gap or from that of 54 patients without over-adduction.

Conclusions: Over-adduction of the unaffected vocal fold did not improve vocal function in patients with UVFP. The presence of over-adduction was not related to age, etiology, or duration of paralysis.

RESULTS

Figures 1 and 2 illustrate representative CT endoscopic images of patients with over-adduction of the unaffected vocal fold with and without a posterior glottal gap, respectively. Figures 3 and 4 exemplify the CT endoscopic images of patients with no over-adduction of the unaffected vocal fold with and without a posterior glottal gap, respectively.

If all 101 patients, over-adduction of the unaffected vocal fold was observed in 47 patients and the remaining 54 did not show over-adduction. There were no significant differences in MPT and MFR values between those with and without over-adduction.

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Figures 3 and 4 exemplify the CT endoscopic images of patients with no over-adduction of the unaffected vocal fold with and without a posterior glottal gap, respectively.

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No significant differences were found in age distribution between patients with and without over-adduction (P = 0.877) (Fig. 5). There was no significant differences in causes of UVFP between the patients with and those without over-adduction (P = 0.911 and 0.326, respectively) within each of the two subgroups: those related to surgery and those unrelated to surgery (Fig. 6).

DISCUSSION

The present results do not suggest that over-adduction of the unaffected vocal fold contributes to better vocal function in patients suffering from paralytic dysphonia because no significant difference in vocal function was found between the patients with over-adduction and those without over-adduction was found. Tanaka et al.2 evaluated fibrescopic video recordings of 120 patients with UVFP and found over-adduction of the unaffected fold in 51 patients (42.5%), and concluded that vocal function was not compensated for by over-adduction.

Forty-three of the 101 patients (42.6%) did not show over-adduction of the unaffected vocal fold, although there was a gap between the vocal processes during phonation. One possible explanation for this finding is that the articular surfaces of the cricoarytenoid joint vary among individuals. Although several authors have reported the anatomy and movements of the cricoarytenoid joint, whether the vocal fold can adduct over the midline was not evaluated.

CONCLUSIONS

Vocal function was not compensated for by over-adduction of the unaffected vocal fold in patients with UVFP.

The presence of over-adduction was not related to age, etiology, or duration of paralysis. Further study is necessary to determine why some patients with UVFP show over-adduction of the vocal fold on the unaffected side during phonation and others do not in spite of the presence of a posterior glottal gap.

REFERENCES


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