

수직 후두부분 적출술 후의 음성분석

아주대학교 의과대학 이비인후과학교실,¹ 연세대학교 의과대학 이비인후과학교실²

김철호¹ · 정상호² · 신중욱² · 김영호² · 최홍식² · 김광문² · 최은창²

Voice Analysis after the Vertical Partial Laryngectomy

Chul-Ho Kim, MD¹, Sang Ho Jung, MD², Joong Wook Shin, MD², Young-Ho Kim, MD²,
Hong Sik Choi, MD², Kwang-Moon Kim, MD² and Eun Chang Choi, MD²

¹Department of Otolaryngology, Ajou University School of Medicine, Seoul; and ²Department of Otorhinolaryngology, Yonsei University College of Medicine, Seoul, Korea

ABSTRACT

Background and Objectives : It is generally believed that reconstruction of the glottic region after vertical partial laryngectomy (VPL) can improve glottic and supraglottic function. But reports on secondary healing without glottic reconstruction after VPL are lacking. This study attempts to obtain an objective phonatory data after VPL without glottic reconstruction. **Materials and Method** : From 1993 to 2001, 13 patients, who had been treated with VPL without glottic reconstruction, and 44 patients who underwent VPL were included in this study. Patients who had been followed up postoperatively less than 12 months were excluded from this study. Seven lesions were classified as T1 glottic cancer and six as T2 glottic cancer ; classic VPL (11 cases) and frontolateral VPL (2 cases). For the evaluation of voice, acoustic (fundamental frequency (Fo), jitter, shimmer, noise to harmonic ratio (NHR)), aerodynamic (maximal phonation time (MPT), mean flow rate (MFR)) analysis and videostroboscopy were done. **Results** : There were significant differences in Fo, jitter, shimmer, NHR, MPT and MFR between VPL group and the normal control group. In videostroboscopy, the following tendencies were observed in many cases : incomplete glottic closure, decreased and irregular mucosal wave and amplitude, supraglottic voicing, abnormal arytenoid movement and anterior commissure blunting. **Conclusion** : We had objective phonatory data after VPL without glottic reconstruction, which showed that voice quality after VPL without glottic reconstruction were somewhat unsatisfactory. Further studies on other surgical techniques of VPL would help to elucidate better ways of improving voice quality in these patients. (Korean J Otolaryngol 2003;46:414-8)

KEY WORDS : Hemilaryngectomy · Vocal function.

T1, T2 margin)	(resection margin)	Hirano	1)	
			1875	Billroth
			(glottic incompetence)	
				1
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: (02) 361 - 8470 · : (02) 393 - 0580
E - mail : eunchangmd@yumc.yonsei.ac.kr

1993 3 2001 3
T1, T2 44
가 가 13
11 (classificational vertical partial laryngectomy), 2
(frontolateral vertical partial laryngectomy)
12 13 version) t - test p<0.05
38 74 58.9
49 (Table 1).
30 63 (48.7)
12 1
기본주파수(Hz)
125.8 ± 18.4 Hz
179.5 ± 50.3
Kay Computerized Speech Lab 4300B(CSL) Multi - Dimensional Voice Program(model MDVP #4305) Aerophone II(model AP2 #6800)
(fundamental frequency), jitter, shimmer, noise - to - harmonic ratio
(maximum phonation time, MPT),
(mean flow rate, MFR)
10 cm가
(p - value : 0.0228)(Table 2).
0.43 ± 0.14%
6.1 ± 4.63%
(p - value : 0.0020)(Table 2).

Table 1. Subjects who received vertical partial laryngectomy without glottic reconstruction

Case	1	2	3	4	5	6	7	8	9	10	11	12	13
Sex/Age	M/64	M/68	M/70	M/59	M/38	M/56	M/74	M/60	M/60	M/57	F/53	M/57	M/64
TN	T2N0	T2N0	T1N0	T2N0	T1N0	T1bN0	T2N0	T1N0	T2N0	T1N0	T1bN0	T1N0	T2N0
Op	VPL	VPL	VPL	VPL	VPL	FL	VPL	VPL	VPL	VPL	FL	VPL	VPL

Op : operation, VPL : vertical partial laryngectomy, FL : frontolateral laryngectomy

Table 2. Acoustic and aerodynamic analysis of normal group and vertical partial laryngectomy group

	Fo	Jitter	Shimmer	NHR	MPT	MFR
Case	179.5 ± 50.3	6.1 ± 4.64	1.33 ± 0.64	0.41 ± 0.19	9.39 ± 3.37	0.35 ± 0.18
Control	125.8 ± 18.4	0.93 ± 0.14	0.29 ± 0.21	0.15 ± 0.04	22.2 ± 6.93	0.18 ± 0.09

Fo : fundamental frequency (Hz), Jitter (%), Shimmer (dB), NHR : noise to harmonic ratio, MPT : maximal phonation time (sec), MFR : mean flow rate (L/sec)

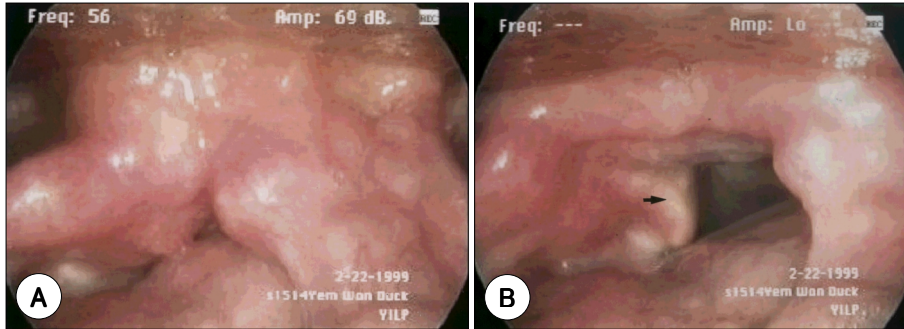


Fig. 1. Stroboscopic finding of right post-hemilaryngectomy patient (postoperative 23 months). Hyperadduction of supraglottic area and incomplete closure during vibratory cycle are noted (Arrow point to the neoglottis). A : Adduction of glottis, B : Abduction of glottis.

Shimmer(dB)

0.29 ± 0.21 dB

1.33 ± .64 dB

(Fig. 1).

가

(p - value : 0.0001)(Table 2).

진동부위

13

Noise to harmonic ratio(dB)

0.15 ± 0.04 dB

0.41 ± 0.19 dB

(neoglottis)

가

(p - value : 0.0009)(Table 2).

가 ,

(supraglottic hyperadduction)

가 5

최대발성 지속시간(sec)

22.2 ± 6.93 sec

9.39 ± 3.37 sec

후두의 비정상적인 운동

(p - value : 0.0001)(Table 2).

4

(hyperadduction)

5

평균 호기율(L/sec)

0.18 ± 0.07 L/sec

0.35 ± 0.18 L/sec

후두의 구조적 변화

2

1

가

(p - value : 0.00108)(Table 2).

(granulation)

(anterior commissure)

(ovoid)

. 4

성문폐쇄부전

(vibratory cycles)

13

6

가

(amplitude)

(neoglottis)가

(vibration)

(glottic competence)

1875 Billroth
Blaugrund

1903 Gluck

¹⁾ 1917 Som
가

³⁾

¹⁾ 가

¹⁾ 가

¹⁾ Jitter shimmer
가 Jitter 9.6%
1987 Hirano 8.4% jitter shimmer가
(vocal stability)

²⁾

(atrophy)

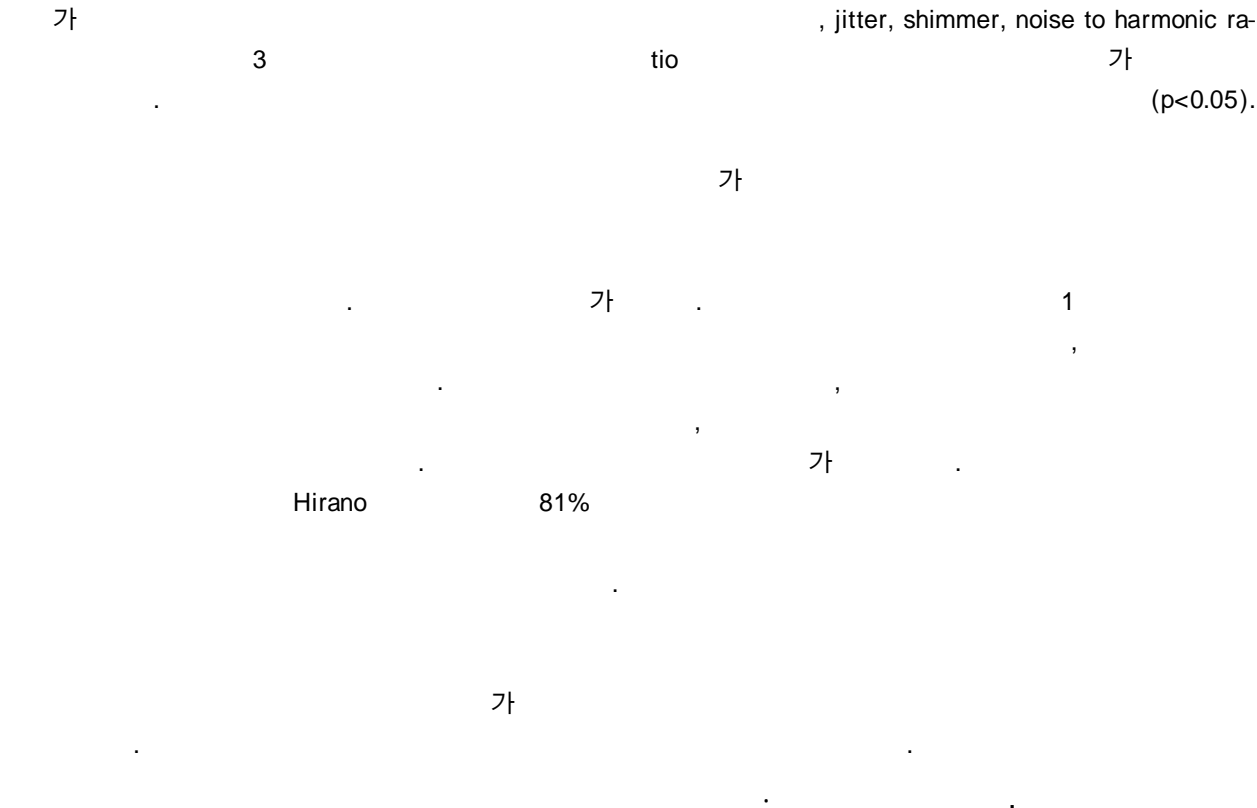
가
가 (rough)

Noise to harmonic ratio
가

¹⁾ noise가 가 ⁷⁾ ji-
1990 Leeper tter shimmer 가가 harmonics
(no reconstruction with secondary noise 가 jitter shimmer
healing) 가가 noise to harmonic ratio 가
⁴⁾ ⁸⁾

1 가 가

가 ⁵⁾ 가



Hirano 81%

(ovoid shape)

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