# Clinical Outcome of Window Partial Laryngectomy for Stage T2-3 Glottic Laryngeal Carcinoma

***Shuangle Wang, *Chu Yang, *Chuangwei Li, *Xin Lin, *Dongtao Yang, *Enhe Chen, and †Yanjun Zeng,** **Shantou and †Beijing, China*

**Summary: Objective.** To investigate the operative impact and therapeutic value of window partial laryngectomy for the treatment of stage T2-3 glottic laryngeal carcinoma.

**Methods.** From October 2000 to December 2006, window partial laryngectomy and laryngeal reconstruction were performed on 48 appropriately selected patients with stage T2-3 glottic laryngeal carcinomas. Twenty-nine males and 19 females were included. Before the operation and in the sixth month after the operation, degree of hoarseness, vocal fold mobility and symmetry, glottal width during quiet breathing, degree of glottal closure during phonating, respiratory function, and swallowing function were surveyed. In addition, tumor recurrence and metastasis and patient survival time were monitored.

**Results.** With the exception of vocal fold mobility ($P = 0.343$), there were significant differences between the two treatment groups in all areas that were investigated, including degree of hoarseness (all $P < 0.01$), vocal fold symmetry ($P = 0.000$), glottal width during quiet breathing ($P = 0.001$), degree of glottal closure during phonating ($P = 0.001$), and respiratory function ($P = 0.001$). Swallowing function was not influenced ($P = 0.310$). There was recurrence in one case (2.1%), cervical lymph node metastasis in one case, and hepatic metastasis in one case. The 3- and 5-year overall survival rates were 96.9% and 88.9%, respectively.

**Conclusions.** This study showed that window partial laryngectomy was successful for treating properly selected stage T2-3 glottic laryngeal carcinoma. This operation was effective for reducing surgical invasion and facilitated the resumption of respiratory and vocal function.

**Key Words:** Laryngeal neoplasms–Laryngectomy–Hoarseness–Recovery of function.

## INTRODUCTION

Laryngeal carcinomas account for 5.7–7.6% of all human cancers in China. An estimated 60% of all laryngeal carcinomas are diagnosed as glottic laryngeal carcinomas. Clinically, T2-3 glottic laryngeal carcinomas are most prevalent, and have traditionally been treated with a vertical partial laryngectomy. However, the disadvantages of this type of surgery include the possibility of poor voice quality and the appearance of breathing problems after the procedure. Here, we evaluated the clinical outcomes of 48 patients with T2-3 glottic laryngeal carcinomas who received window partial laryngectomies as the primary treatment in our hospital between October 2000 and December 2006.

## PATIENTS AND METHODS

### Patients and treatment

A total of 48 patients with T2-3 glottic laryngeal carcinomas were recruited at our hospital. The patients included 29 men and 19 women with ages ranging from 43 to 78 years (median age: 57 years). Clinical T stage was determined preoperatively using laryngofiberscopy and laryngeal computed tomography (CT) scans. Touch and a type-B ultrasonic device were used to examine lymphadenectasis. X-ray and CT scans were used to identify distant metastases. According to the classification criteria of the International Union against Cancer, patients were designated as T2N0M0 (n = 10), T2N1M0 (n = 7), T3N0M0 (n = 22), T3N1M0 (n = 5), or T3N2M0 (n = 4) before operation. Tumors were confirmed by preoperative biopsy and postoperative pathological examination. Patients with a laryngeal carcinoma invasion of the epiglottis, the inferior margin of the cricoid cartilage, the cricoarytenoid joint, or the aryepiglottic fold were excluded from the study.

### Surgery

All patients underwent preoperative general anesthesia. Thirty-two patients received an anterior median incision in the neck. The remaining 16 patients received a U-shaped incision in the neck to allow for neck lymph node dissection. The laryngofissure was performed with a midline thyrotomy using surgical scissors. The laryngeal cartilage was separated from the tumor, and 0.5–1.0 cm was resected from the tumor margin. Lesions in the vocal fold, laryngeal muscle, paraglottic space, and perichondrium combined with thyroid cartilage were all resected together (Figure 1). Contralateral vocal fold lesions were resected with the same method if they had also been invaded (the lesions through anterior commissure spread to contralateral vocal fold). The upper part of the cricoid cartilage was also resected if the lesions spread to subglottic region. Frozen pathological sections of the margins were used to determine whether those areas were tumor free. A perichondrium-wrapped muscle bundle was used for vocal fold reconstruction. An anterior neck strap muscle was used to repair the lesion of the glottis and to enclose the laryngeal cavity (for schematic drawing of the operation, see Figures 2–6). Sixteen patients with lymphadenectasis underwent neck lymph node

Accepted for publication July 1, 2009.

From the *Department of Otorhinolaryngology Head and Neck Surgery, Shantou City Central Hospital, Shantou, China; and the †Biomechanical & Medical Information Institute, Beijing University of Technology, Ping Le Yuan, Beijing, China.

Address correspondence and reprint requests to Yanjun Zeng, Shuangle Wang, and Yanjun Zeng, Biomechanical & Medical Information Institute, Beijing University of Technology, No. 100, Ping Le Yuan, Beijing 100022, China. E-mail: yjzeng@bjut.edu.cn

Journal of Voice, Vol. 25, No. 1, pp. 124-128
0892-1997/$36.00

doi:10.1016/j.jvoice.2009.07.001

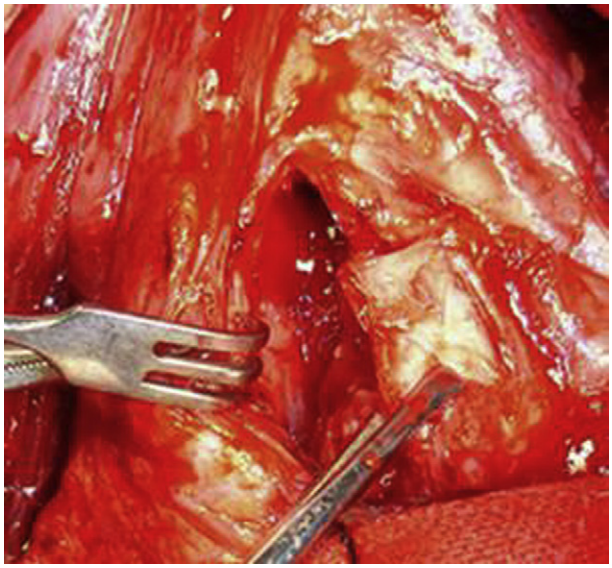

**FIGURE 1.** Vocal fold lesions, laryngeal muscle lesions, paraglottic space lesions, and perichondrium combined with thyroid cartilage were all resected together through a window in the lamina cartilaginis thyroidea.

dissections, but only six patients had lymphatic metastasis of tumor that had been proved by pathological examination after operation, and the remaining 10 patients had only lymphatic reactive proliferating. Twenty-one patients with a tumor diameter larger than 3 cm, poorly differentiated carcinomas, or lymph node metastases received postoperative radiotherapy at a dose of 48–62 Gy.

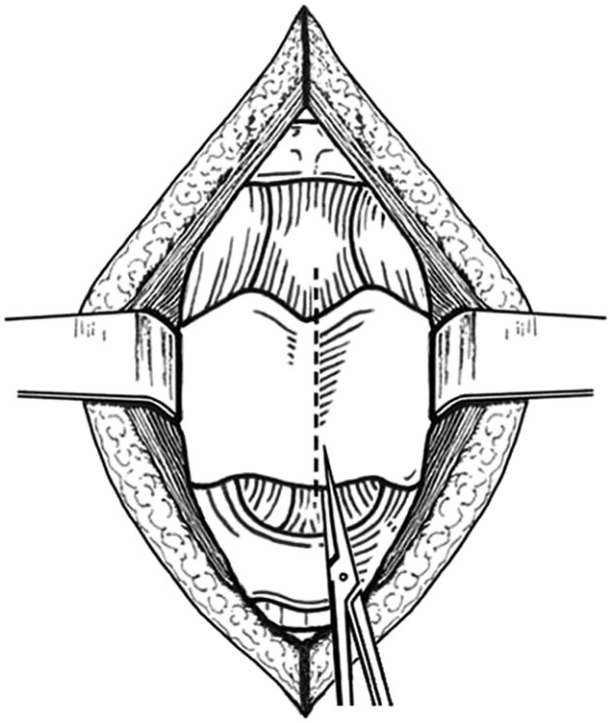

**FIGURE 2.** Laryngofissure was performed with midline thyrotomy using surgical scissors.

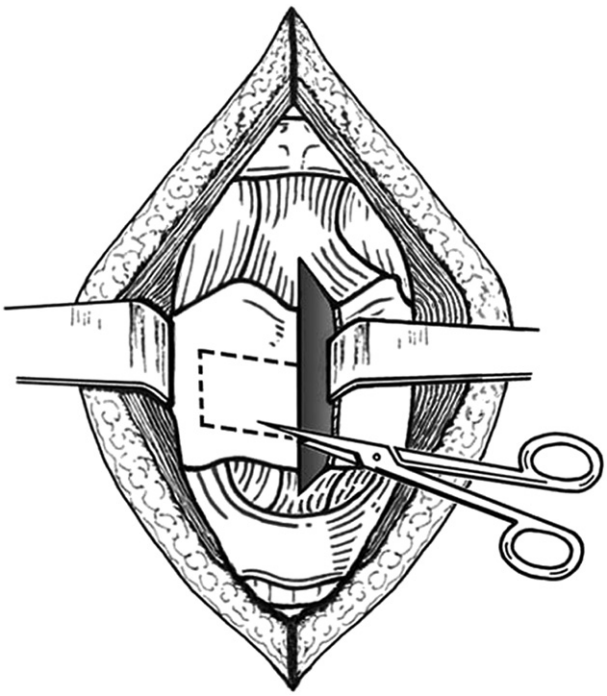

**FIGURE 3.** Vocal fold lesions, laryngeal muscle lesions, paraglottic space lesions, and perichondrium combined with thyroid cartilage were all resected together, retaining the remaining laryngeal skeleton.

## Observations

Preoperative and 6-month postoperative hoarseness evaluations were performed by the patients themselves and by three experienced physicians. The degrees of hoarseness were classified using a 4-point scale ranging from 0 to 3 (normal = 0,

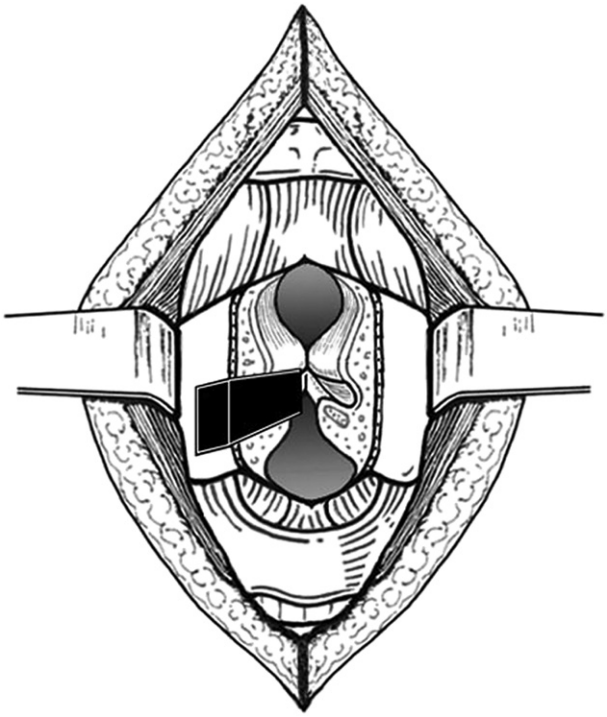

**FIGURE 4.** There was a "window" breach after resection.