

The Latest Topics for the Japan Broncho-esophagological Society

JMAJ 54(2): 127–128, 2011

Naoyuki KOHNO*¹

In some types of tracheal and thyroid disease, tracheal resection is often required. For patients with such diseases, tracheal reconstruction using the trough method or end-to-end anastomoses has been chosen. Omori K et al. reported the clinical application of in situ tissue engineering using a scaffolding technique for laryngeal and tracheal tissue. They had already developed a tissue scaffold made from a Marlex mesh tube covered with collagen sponge, and had previously applied in situ tissue engineering with a scaffold implant to repair the larynx and trachea in 10 patients. Specifically, subglottic stenosis, the thyroid cartilage, cricoids cartilage, and cervical trachea with scarring and granulation were treated by resection of the focus and the patients' tracheas were reconstructed using the scaffold. Post operative endoscopy showed a well-epithelialized airway lumen without any obstruction. This observation indicates the potential value of this procedure for use in the regeneration of airway defects.¹

For preserving laryngeal function, chemoradiotherapy, open partial laryngectomy or pharyngectomy, and transoral laser microsurgery are commonly chosen therapeutic methods of treating T1, T2, and selected T3 supraglottic and hypopharyngeal cancers. Shiotani A et al. built a new surgical environment that combines a distending laryngoscope, a rigid laryngeal videoendoscope, an electric scalpel, and forceps for laparoscopic surgery. This system provides a large field of view and large working space, enabling surgeons to operate a laparoscopic scalpel and forceps with both hands and to perform en bloc tumor resection. Videolaryngoscopic transoral en bloc resection has been performed using this new system.² In 21 cases with a mini-

mum follow-up period of 1 year (average 33 months; range 15 to 56 months), the 3-year disease-specific survival rate and the laryngeal preservation rate were both 95%. Normal food intake recovered eventually in all cases. These results indicate that videolaryngoscopic transoral en bloc resection using laparoscopic surgical instruments could be a minimally invasive treatment option for supraglottic and hypopharyngeal cancers with satisfactory oncological outcome and postoperative laryngeal function. With this procedure, neck node dissections were performed for node-positive patients. To reduce surgical invasion, omission of regional lymph node dissection is considered to be possible for cancers for which the sentinel lymph node concept has been established.

In head and neck squamous cell carcinoma (SCC), the lymph node status of the neck is the most important prognostic factor. The presence of cervical metastases cannot always be detected either clinically or pathologically by current routine methods. Ultrasound-guided fine needle aspiration cytology, which is currently the optimal procedure, still has a sensitivity of only 42–73%. The sentinel lymph node (SLN) is the first lymph node to receive drainage from the primary tumor site. The ultimate goal of SLN study is to avoid unnecessary elective neck-node dissection. Kohno N et al. examined the feasibility of SLN radiolocalization in clinically neck node-negative oral SCC patients.³ A radiolabel with unfiltered ^{99m}Tc tin colloid was injected submucosally around the primary site. Micrometastasis was detected in 5 out of 15 patients (33%). This result indicated that neck dissection can be omitted for 67% of patients. A skip lesion was detected in one case (6.7%). Based on these results, Kohno and his

*1 President, Japan Broncho-esophagological Society; President, Kyorin University Hospital, Tokyo, Japan (sukohno@ks.kyorin-u.ac.jp).



Fig. 1 HyperEye Medical System

colleagues began performing sentinel lymph node navigation surgery (SNNS) in 2006. Micrometastasis was detected in 4 out of 11 patients and neck dissection was performed. The remaining 7 patients were negative for micrometastasis and avoided neck dissection. One patient died of other causes. Ten patients are alive without disease at present.

Currently, Hasegawa Y et al. is carrying out a multi-center group study in Japan. Seven institutions are participating and 178 patients are



Fig. 2 ICG fluorescence imaging

The SLN was displayed transcutaneously as a shining spot.

registered. Conventional frozen section at the time of surgery, which is a relatively reliable intraoperative diagnostic method, was performed.⁴ However, this approach is very time consuming, and so a rapid technique using molecular markers would be a valuable tool for detecting lymph node invasion in the future. For this reason, research was begun for a newly developed SN detection method using cytokeratin 19, One Step Nucleic acid Amplification (OSNA), for rapid detection of cancer metastasis in lymph nodes. The preliminary results of this study are promising. Indocyanine green (ICG) fluorescence-guided sentinel node biopsy is also being performed using the HyperEye Medical System (**Fig. 1**). This system enables better visualization for detecting SLNs and allows transcutaneous real-time lymphography for intraoperative identification of SLNs (**Fig. 2**). Color TV monitor images are better for use in identification than monochrome images and so can contribute to faster and easier discovery of SLNs. Thus it is believed that the concept for this study is a valid method for determining the necessity of neck dissection for node-negative T1, T2, and selected T3 supraglottic and hypopharyngeal cancers.

References

1. Omori K, Tada Y, Suzuki T, et al. Clinical application of in situ tissue engineering using a scaffolding technique for reconstruction of the larynx and trachea. *Ann Otol Rhinol Laryngol.* 2008;117(9):673–638.
2. Shiotani A, Tomifuji M, Araki K, Yamashita T, Saito K. Video-laryngoscopic transoral en bloc resection of supraglottic and hypopharyngeal cancers using laparoscopic surgical instruments. *Ann Otol Rhinol Laryngol.* 2010;119(4):225–232.
3. Kohno N, Ohno Y, Kihara K, et al. Feasibility of sentinel lymph node radiolocalization in neck node-negative oral squamous cell carcinoma patients. *ORL J Otorhinolaryngol Relat Spec.* 2003 65(1):66–70.
4. Hasegawa Y, Yoshimoto S, Matsuzuka T, et al. Sentinel node biopsy for oral and pharyngolaryngeal squamous cell carcinoma: a retrospective observational study on 178 patients. Abstract from 4th International Conference on Sentinel Node Biopsy and Radioguided Head & Neck Surgery.