Objective: To decrease the aspiration rate of the previously reported simple mucodermal tracheoesophageal (TE) shunt method for voice restoration after total laryngectomy with the use of omohyoid muscle loop.

Design: Retrospective clinical analysis.

Setting: Department of Otorhinolaryngology, Fukui Medical University, Fukui, Japan.

Patients: Ten male patients underwent total laryngectomy and received TE shunt by the omohyoid muscle loop method for voice restoration. There were 5 patients with glottic laryngeal cancer, 2 with supraglottic laryngeal cancer, and 3 with hypopharyngeal cancer. Patients' age ranged from 46 to 66 years.

Intervention: The dermal incision on the neck was U-shaped with a superiorly pedicled, small U-shaped dermal flap. This small flap was used to form the anterior wall of the shunt. Bilateral omohyoid muscles were preserved at the total laryngectomy site with or without neck dissection. After creating a TE shunt directly on the posterior wall of the tracheal stump, the bilateral omohyoid muscles were looped through each other beneath the TE shunt.

Main Outcome Measurements: Maximum phonation time, maximum phonation intensity, and rating scales of shunt voice, aspiration rate, and survival time.

Results: Mean maximum phonation time was 20 seconds, while mean maximum phonation intensity was 83 dB. The first voice was obtained on postoperative day 29 on average. Of the 10 patients, 9 could phonate, with 1 case (10%) of slight aspiration 3 months after the surgery.

Conclusions: Although this omohyoid muscle loop method needs to preserve the hyoid bone with those muscles, aspiration was prevented more effectively compared with the former, direct mucodermal TE shunt method. The indication for this method is preferably glottic laryngeal cancer.

sutured to the opposite omohyoid muscle using polyglactin 910 (Vicryl; Ethicon Inc, Somerville, NJ). The middle part of omohyoid muscle is slim and was placed directly under TE shunt. The TE shunt was placed under slight tension toward the hyoid bone by the looped omohyoid muscle. It was not necessary to preserve the ansa cervicalis (Figure 2). Maximum phonation time, maximum phonation intensity, and rating scales of the shunt voice, aspiration rate, and survival time were evaluated.

**RESULTS**

The mean±SD maximum phonation time was 20±5 seconds, and the mean±SD maximum phonation intensity was 83±8 dB. The first voice was obtained on postoperative day 29±13. Three months after the operation, 9 patients (90%) could phonate, with 1 case (10%) of slight aspiration (Table). Tracheoesophageal speech was assessed by nonprofessional listeners as “good,” “average,” or “poor” according to rating scales measuring the number of syllables per breath, use of voice, and intelligibility. Eight patients were assessed as “good,” 1 as “average,” and 1 as “poor.”

Nine patients survived from 11 months to 7 years. One patient (patient 3) died of renal failure. All the patients had no recurrence of disease. This result indicates that preservation of the omohyoid muscle does not inhibit the curability.
The first problem was whether to use the omohyoid muscle unilaterally or bilaterally. One side of the omohyoid muscle was applied in the first case, supraglottic laryngeal cancer (T4 N0 M0) in a 62-year-old man. Although aspiration in this case was slight and was prevented with finger pressure on the shunt, sphincter action at deglutition only seemed to be weak from the unilateral muscle. The bilateral omohyoid muscles were used to form a loop beneath the shunt, with the expectation of stronger sphincter action thereafter. Therefore, this first case was excluded from the series.

The future condition of the looped omohyoid muscle is a matter of concern. We were fortunate to have the opportunity to observe the omohyoid muscle 7 months after looping. Patient 9 complained of passage disturbance of the esophagus and occasional efflux from the nose. The patient could phonate smoothly, but a radiographic fluorogram revealed stenosis around the hyoid bone. Therefore, a pharyngeal myotomy along the hyoid bone was carried out under general anesthesia. His voice remained weak, and a phonographic fluorogram revealed stenosis around the hyoid bone. Therefore, a pharyngeal myotomy along the hyoid bone was carried out under general anesthesia. His future condition of the looped omohyoid muscle is a matter of concern. We were fortunate to have the opportunity to observe the omohyoid muscle 7 months after looping. Patient 9 complained of passage disturbance of the esophagus and occasional efflux from the nose. The patient could phonate smoothly, but a radiographic fluorogram revealed stenosis around the hyoid bone. Therefore, a pharyngeal myotomy along the hyoid bone was carried out under general anesthesia. His voice remained weak, and a phonographic fluorogram revealed stenosis around the hyoid bone. Therefore, a pharyngeal myotomy along the hyoid bone was carried out under general anesthesia. His voice remained weak, and a phonographic fluorogram revealed stenosis around the hyoid bone. Therefore, a pharyngeal myotomy along the hyoid bone was carried out under general anesthesia. His voice remained weak, and a phonographic fluorogram revealed stenosis around the hyoid bone. Therefore, a pharyngeal myotomy along the hyoid bone was carried out under general anesthesia.