Reconstruction of circumferential pharyngeal defect with C-shaped (patch-style) anterolateral thigh flap after total laryngopharyngectomy

Alessa Mohammad Ali[1] · Kim Won Shik[2]

1Center of Head and Neck and Skull base health , King Abdullah medical city, Makkah, Saudi Arabia; 2 Department of Otorhinolaryngology-Head and Neck Surgery, Seoul National University Hospital, Seoul, Korea

Introduction

This study has investigated the usefulness and postoperative outcomes of a new patch-style (C-shaped) anterolateral thigh (ALT) flap reconstruction method, utilizing the prevertebral fascia as the posterior wall, for circumferential pharyngeal defect after total laryngopharyngectomy.

The outcomes were compared with those of the tubing style flap reconstruction

Methods

Between January 2015 and July 2017, 11 patients indicated for a total laryngopharyngectomy were included in this study. The patients were stratified into two groups: those who underwent a tubing style flap reconstruction and those who underwent a C-shaped patch-style ALT flap reconstruction.

A complete resection of the laryngeal tumor was performed with a circumferential resection of the hypopharynx. Thereafter, the posterior oropharyngeal wall stoma was sutured to the prevertebral fascia superiorly, and the posterior esophagus wall stoma was sutured to the prevertebral fascia inferiorly. A C-shaped patch-style ALT flap was harvested (Fig. 1) and patched over the prevertebral fascia; the flap was sutured beginning from the left lateral superiorly, proceeding toward the prevertebral fascia of the same side (Fig. 2), going inferiorly until the inferior part of the ALT flap was sutured to the esophageal stoma. Then, the suture was continued to the right lateral side from the inferior side to the superior, terminating with the suture of the superior part of the ALT flap to the oropharyngeal stoma. The ALT fascia was also reinforced as a second layer over. A small skin island was sutured over the surgical wound on the neck skin or at the tracheal stoma to monitor the flap.

The nasogastric tube was removed on postoperative day 14 after confirming that there was no leakage on oral barium swallow imaging examination. Thereafter, the patient was permitted to gradually resume oral feeding intake as tolerable.

Results

Eleven patients (mean age, 63.6 years with 4-5 SD; 8 men and 3 women) underwent total laryngopharyngectomy during the study period
A single reconstructive surgeon treated all patients. The tubing style of the flap was used for reconstruction in seven patients;
All patients in both groups were treated with the same postoperative protocol.
The ALT flap was used for pharyngeal reconstruction in all patients except in one patient in the patch-style group as there was no artery for anastomosis, Therefore, we used the pectoralis major myocutaneous rotation flap in this patient
The minim follow-up period for each patient was three years and the maximum follow-up period was five years.
All patients who underwent the tubing style flap reconstruction had a longer hospital stay than those who underwent the patch-style ALT flap reconstruction (mean [range]: 51.7 days [range, 18–83 days] vs. 19 days [18–20], respectively).
No patient in the patch-style group required a dilation procedure, whereas, in the tubing style group, a mean of one dilation procedure was performed in each patient.
A total of 42% patients who underwent the tubing style reconstruction required percutaneous endoscopic gastrostomy for feeding, while all patients who underwent patch-style reconstruction resumed oral feeding.
Pharyngocutaneous fistula was developed in 42% of the patients who underwent tubing style flap reconstruction, but in none who underwent the patch-style ALT flap reconstruction.

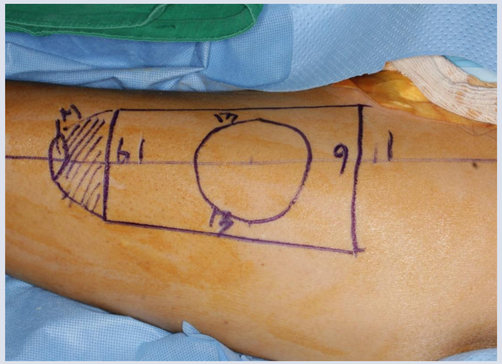

Figure 1. Design of the ALT flap with skin island for postoperative monitoring. ALT, anterolateral thigh flap

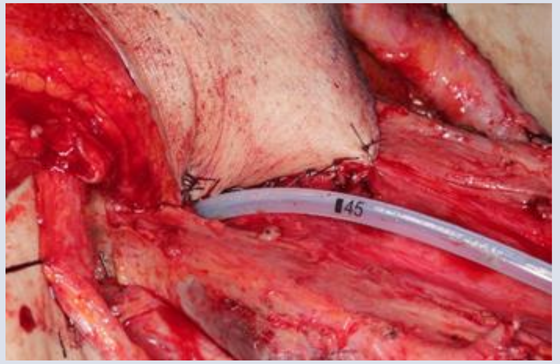

Figure 2. Starting the suturing of the ALT flap toward the lateral prevertebral fascial wall.

DISCUSSION

The optimal reconstruction technique for a circumferential pharyngeal defect after total laryngopharyngectomy should have low mortality, low morbidity, short hospital stay, facilitate the early resumption of oral feeding with a normal diet, good speech development, and good tolerance to postoperative radiation.

We conducted a literature survey of the postoperative outcomes of different reconstruction methods developed over the years . The outcomes reported previously were compared with our results; our old-style ALT tubing equal to published unlike the new procedure is a much better result.

The result from the literature survey showed that postoperative complications develop in 3–63% of patients in a different institution. In contrast, patients who underwent the new patch-style flap reconstruction were free from this complication (Table 1).

	PMMC Tubing	PMMC Patch-Style	Jejunal Flap	ALT Tubing	ALT Patch-Style
Pen-Yuan et al	63% (7of 11)	26% (5 of19)			
Jan S. Lewin et al			3% (1 of 31)	7% (2 of 27)	
Peirong Yu, et al	23% (22 of 92)		4 % (4 of 86)	12.5 (3 of 24)	
Yu Wai Chan et al			3% (1 of 31)	7% (2 of 26)	
Our study				42% (3 of 7)	0% (0 of 4)

Conclusions

Direct comparison of the surgical and functional outcomes of different flap reconstruction methods at our center or from literature survey showed that the novel C-shaped (patch-style) ALT flap reconstruction technique, which used the prevertebral fascia as the posterior wall, is a promising reconstruction method for patients with a circumferential pharyngeal defect