



Operative Procedures of Reconstruction after Resection of Esophageal Cancer and the Postoperative Quality of Life

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To investigate the influence of the operative procedures of reconstruction after resection of esophageal cancer on the postoperative quality of life, an interview was conducted and subjective and objective factors related to the quality of life were evaluated in 50 patients without a recurrence of esophageal cancer. Among the 50 cases, reconstruction by the antethoracic route was performed in 9 (group I) and by the retrosternal route in 24 (group II). Intrathoracic anastomosis was done in 17 (group III). A postoperative disturbance of the food passage was seen 22.0, 41.6, and 5.9% in groups I, II, and III, respectively. Dumping symptom was evident 11.1, 12.5, and 11.8%, respectively. Heartburn was seen only in two cases, in group III. A body weight loss of more than 1.0 kg from preoperative weight was seen in 33.3, 41.7, and 41.2% of groups I, II, and III, respectively. There was no difference in the postoperative performance status or laboratory data among the groups. Thus, although intrathoracic anastomosis was favorable for postoperative food passage, there was no significant difference in any other factors in the quality of life among the routes of reconstruction, and the quality of life gradually improved in patients of all groups as postoperative time passed in the cases without postoperative recurrence of esophageal cancer.

Carcinoma of the esophagus is a malignancy with a poor prognosis, presumably due to local advancement and occult metastatic lesions already present at the time of surgery. However, advances in surgical techniques and perioperative aggressive multidisciplinary treatments have greatly reduced operative mortality, and the long-term results have steadily improved [1-3]. These factors have resulted in an increased awareness of the need to evaluate the outcome—not only in terms of cure and survival, but also in terms of the quality of life.

On the other hand, esophageal resection and reconstruction has now become a safe procedure, and the postoperative mortality within a month is under 5 per cent [4-6]. Antethoracic reconstruction [7], retrosternal reconstruction [8], or intrathoracic anastomosis [9] is usually performed, depending on the surgeon's preference. Each route of reconstruction contains both advantages and disadvantages. However, to our knowledge, there have been no comparative studies of these proce-

dures, especially regarding the influence of these procedures on the postoperative quality of life.

In the present study, we investigated the influence of the operative procedures for reconstruction after resection of esophageal cancer on the postoperative quality of life by means of an analysis based on the results of interviews of patients without a recurrence of esophageal cancer.

Patients and Methods

One hundred fifty-nine patients with thoracic esophageal carcinoma underwent esophageal resection and reconstruction in our department from 1986 to 1990. Among these 159 cases, 71 patients survived more than a half year after surgery in good condition and without any signs or symptoms of recurrence. Among the 71 patients, an interview was done on 53 patients concerning the influence of the operative procedures of reconstruction after resection on the postoperative quality of life. There were only three cases with an abdominocervical (transhiatal) blunt dissection of the esophagus [10] and these three were excluded in this study. Of 50 patients, 14 survived for less than a year; 16 for more than 1 year; 10 for more than 2 years; 6 for more than 3 years; and 4 for more than 4 years after primary operation. Pyloroplasty was performed on all 50 cases.

These 53 patients were classified into the following three groups according to the operative procedures of esophageal reconstruction after resection. Group I included 9 patients reconstructed through the antethoracic route. In this group, the gastric tube and colon were used as esophageal substitutes in eight and one cases, respectively. Group II included 24 cases reconstructed through the retrosternal routes. In this group, the gastric tube was used in all cases. Group III included 17 patients reconstructed with intrathoracic anastomosis. In this group, the gastric tube was used in all but one case with colonic interposition.

We investigated the status of food passage, dumping symptom, postoperative hoarseness, heartburn, body weight loss, performance status [11], and biochemical data in each group. With regard to food passage, patients were evaluated based on the presence of subjective symptoms of dysphagia. The pres-

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Table 1. Clinicopathologic characteristics of patients with esophageal carcinoma reconstructed with antethoracal, retrosternal routes and intrathoracic anastomosis.

	No. (%)		
	Group I ^a (n = 9)	Group II ^b (n = 24)	Group III ^c (n = 17)
Age	56.1 ± 7.59	61.0 ± 9.85	62.5 ± 8.8
Sex	3.5:1	11:1	4.7:1
Location of cancer			
Upper	5 (55.6)	5 (20.8)	3 (17.6)
Middle	4 (44.4)	16 (66.7)	6 (35.3)
Lower	0	3 (12.5)	8 (47.1)
Depth of invasion			
Intraepithelium	0	0	1 (5.9)
Mucosal layer	2 (22.2)	0	4 (23.5)
Submucosa	1 (11.1)	6 (25.0)	3 (17.6)
Proper muscular layer	0	4 (16.7)	1 (5.9)
Adventitia	6 (66.7)	14 (58.3)	7 (41.2)
Lymph node metastasis			
(-)	5 (55.6)	17 (70.8)	14 (82.4)
(+)	4 (44.4)	7 (29.2)	3 (17.6)

^aGroup I, antethoracal route.

^bGroup II, retrosternal route (%).

^cGroup III, intrathoracic anastomosis.

Table 2. Occurrence of postoperative dysphagia in the groups of routes of reconstruction.

Route of reconstruction	Years after operation					Total (%)
	0.5-1	-2	-3	-4	-5	
Group I ^a		0/2	1/3	0/1	1/3	2/9 (22.2)
Group II ^b	6/10	4/10	0/4			10/24 (41.7)
Group III ^c	0/4	1/4	0/3	1/5	0/1	1/17 (5.9)
	6/14 (42.9)	5/16 (31.3)	1/10 (10.0)	1/6 (16.7)	1/4 (25.0)	13/50 (26.0)

^aGroup I, antethoracal route.

^bGroup II, retrosternal route.

^cGroup III, intrathoracic anastomosis.

ence of dumping symptom, hoarseness, and heartburn was also investigated by data obtained at interviews. For evaluation of body weight loss, when the postoperative latest weight loss was more than 1.0 kg than the preoperative weight, it was judged to be positive. Performance status (P.S.) was estimated as follows: When the patients were fully ambulatory asymptomatic or symptomatic, the P.S. was judged to be P.S. 0 or P.S. 1, respectively. When the patients were not fully ambulatory, but were out of bed more than 50% of the time, the P.S. was 2, and when less than 50%, the P.S. was judged to be 3. If the patients were bedridden, the P.S. was designated as 4.

Results

Table 1 shows the clinicopathologic characteristics of esophageal cancer in the groups divided according to the route of reconstruction. The proportions of the cases with carcinoma located in the lower esophagus, and those with less locally advanced cancer, as well as those without lymph node metas-

Table 3. Occurrence of dumping symptom in the groups with reconstruction.

Route of reconstruction	Years after operation					Total (%)
	0.5-1	-2	-3	-4	-5	
Group I ^a		0/2	1/3	0/1	0/3	1/9 (11.1)
Group II ^b	1/10	2/10	0/4			3/24 (12.5)
Group III ^c	0/4	1/4	1/3	0/5	0/1	2/17 (11.8)
	1/14 (7.1)	3/16 (18.8)	2/10 (20.0)	0/6	0/4	6/50 (12.0)

^aGroup I, antethoracal route.

^bGroup II, retrosternal route.

^cGroup III, intrathoracic anastomosis.

Table 4. Occurrence of postoperative hoarseness in the reconstruction groups.

Route of reconstruction	Years after operation					Total (%)
	0.5-1	-2	-3	-4	-5	
Group I ^a		0/2	0/3	0/1	0/3	0/9
Group II ^b	4/10	3/10	1/4			8/24 (33.3)
Group III ^c	0/4	0/4	0/3	0/5	0/1	0/17
	4/14 (28.6)	3/16 (18.8)	1/10 (10.0)	0/6	0/4	8/50 (16.0)

^aGroup I, antethoracal route.

^bGroup II, retrosternal route.

^cGroup III, intrathoracic anastomosis.

tasis, tended to be higher in the group of patients reconstructed with intrathoracic anastomosis (group III) when compared with those with antethoracal (group I) and retrosternal (group II) reconstructions.

The occurrence of postoperative dysphagia in group II was higher (41.7%) when compared with group I (22.2) and group III (5.9), but this symptom has, in general, gradually improved (Table 2).

Dumping symptom has also gradually improved as postoperative time passes, and there was no difference in the occurrence of this symptom among the groups (Table 3).

Postoperative hoarseness was seen only in group II, and this is thought to be due to many cases of recent aggressive lymph node dissection contained in group II (Table 4). Besides group III, in which the recurrent nerve is seldom injured during operation, the route of reconstruction itself does not influence the occurrence of this complication.

Postoperative heartburn was seen in only two cases in group III, but this complication was easy to control by drug therapy.

A body-weight loss of more than 1.0 kg from preoperative weight was evident in 33.3, 41.7, and 41.2% in groups I, II, and III, respectively, while after 3 years the postoperation body weight had recovered in most cases (Table 5).

Postoperative performance status in group I revealed 100% with grades 0 and 1, while those in group II were 87.5%, those in Group III showed 94.1%, and there was no difference in the

Table 5. Body weight loss in the groups of reconstruction.

Route of reconstruction	Years after operation					Total (%)
	0.5-1	-2	-3	-4	-5	
Group I ^a		0/2	2/3	0/1	1/3	3/9 (33.3)
Group II ^b	6/10	4/10	0/4			10/24 (41.7)
Group III ^c	0/4	3/4	3/3	1/5	0/1	7/17 (41.2)
	6/14 (42.9)	7/16 (43.8)	5/10 (50.0)	1/6 (16.7)	1/4 (25.0)	20/50 (40.0)

^aGroup I, antethoracal route.

^bGroup II, retrosternal route.

^cGroup III, intrathoracic anastomosis.

performance status among the groups. This performance status also gradually improved as postoperative time passed (Table 6).

Discussion

In 1986, we reported the data of interviews with 64 patients who underwent esophageal resection and reconstruction and revealed that there was no evidence of any diminished quality of life in these patients. From these results we concluded that physicians should recommend an operation for patients with carcinoma of the esophagus [12]. The current study also revealed that the quality of life was sustained after operation for esophageal cancer and that it gradually improved as postoperative time passed, although this study only focused on patients without any signs of recurrent disease.

Antethoracal [7] and retrosternal [8] routes and intrathoracic anastomosis [9] are usually used for reconstruction after resection of the esophagus. One of the greatest advantages of intrathoracic anastomosis is that a long esophageal substitute is not necessary, and any ischemic portion of the substitute can be resected. As a result, substitutes with an adequate blood supply can be anastomosed to the proximal esophagus. The greatest disadvantage of intrathoracic anastomosis is that intrathoracic complications can sometimes be fatal when anastomotic leakage occurs. On the other hand, with the antethoracal route, there is a poorer blood supply and increased tension because it is the longest route, but anastomotic leakage is usually easily managed when it occurs. In addition to the advantages and disadvantages of the routes of reconstruction, the present study revealed that, from the viewpoint of postoperative quality of life, the occurrence of postoperative dysphagia was lowest in the group with intrathoracic anastomosis when compared to the other groups. Although heartburn was only seen in the patients with intrathoracic anastomosis, which was one of the disadvantages of this procedure, it was easy to control by drug therapy.

It is evident that the choice of procedure of the resection and reconstruction for treatment of esophageal cancer should be made not only on the merits and demerits of the procedures, including the influence on the quality of life. The condition of the esophageal carcinoma should also be considered. Intrathoracic anastomosis was usually performed on cases with carcinoma located in the lower esophagus and on those with relatively early-staged carcinoma without lymph node metastasis.

Table 6. Performance status (P.S.) after esophageal reconstruction.

Route of reconstruction	Years after operation					Total %
	0.5-1 (P.S.)	-2	-3	-4	-5	
Group I ^a		0, 2 2	0, 3 3	0, 1 1	1, 2 3	1, 8 9 (100)
Group II ^b	1, 7 10	4, 5 10	2, 2 4			7, 14 24 (87.5)
Group III ^c	1, 3 4	1, 3 4	0, 2 3	2, 3 5	0, 1 1	4, 12 17 (94.1)
	2, 10 14 (85.7)	5, 10 16 (93.8)	2, 7 10 (90.0)	2, 4 6 (100)	1, 3 4 (100)	12, 34 56 (92.0)

^aGroup I, antethoracal route.

^bGroup II, retrosternal route.

^cGroup III, intrathoracic anastomosis.

Therefore, the indication of this procedure was somewhat limited as compared with other procedures.

On the other hand, our data in this study also revealed that the quality of life gradually improved in patients of all groups as postoperative time passed, and there was no difference in the quality of life among the groups after 3 years following operation, unless there were signs of recurrent disease.

Consequently, from the viewpoint of postoperative quality of life, intrathoracic anastomosis is believed to be better in preventing for dysphagia, but the difference in the quality of life in each group of reconstruction diminished as postoperative time passed.

Acknowledgments

The authors thank Mr. Brian T. Quinn for critical comments.

Résumé

Pour étudier l'influence des différentes techniques de reconstruction après résection pour cancer de l'esophage sur la qualité de vie postopératoire, on a interviewé 50 patients opérés et indemnes de récidence. Parmi ceux-ci, 9 avaient eu une reconstruction en position présternale (groupe 1), 24 par une voie rétrosternale (groupe 2) alors que 17 avaient eu une anastomose intrathoracique (groupe 3). Des difficultés d'alimentation ont été observées chez respectivement 22; 41.6 et 5.5% des patients dans les groupes 1, 2 et 3. Un syndrome de dumping a été observé chez respectivement 11.1, 12.5 et 11.8%. Un pyrosis n'a été noté que dans deux cas du groupe 3. Une perte de poids supérieure à un Kg a été observée chez respectivement 33.3, 41.7 et 41.2% des patients. Il n'y avait aucune différence postopératoire en ce qui concerne les tests de performance ou les tests de laboratoire. En conclusion, bien que la voie intrathoracique soit la meilleure en ce qui concerne l'alimentation, il n'y avait aucune différence quant à la qualité de vie pour les trois techniques. *La qualité de vie s'est amélioré progres-*

sivement chez tous les patients quelle que soit la technique employée s'il n'avait pas de récurrence.

Resumen

Con el propósito de determinar la influencia sobre la calidad de vida de los procedimientos operatorios de reconstrucción luego de la resección de un cáncer esofágico, se realizaron entrevistas para valorar los factores tanto subjetivos como objetivos relativos a la calidad de la vida en 50 pacientes libres de enfermedad recurrente. En este grupo de 50 pacientes se practicó reconstrucción por la vía anterotorácica en 9 (Grupo I), por la ruta retroesternal en 24 (Grupo II) y se practicó anastomosis intratorácica en 17 (Grupo III). Se demostró alteración en el paso de los alimentos en 22.0%, 41.6% y 5.9% en los Grupos I, II y III, respectivamente; se evidenciaron síntomas de "dumping" en 11.1%, 12.5% y 11.8% en cada grupo. Sólo se encontró pirosis en dos casos en el Grupo III. Pérdida de peso mayor de 1.0 kg frente al peso preoperatorio fue observada en 33.3%, 41.7% y 41.2%, respectivamente. No hubo diferencia en cuanto a la actividad física postoperatoria ni en los hallazgos de laboratorio entre los grupos. Por lo tanto, aunque la anastomosis intratorácica es más favorable en cuanto al buen paso de los alimentos, no se evidencian diferencias significativas en los demás factores pertinentes a calidad de vida entre las diferentes rutas de reconstrucción, y la calidad de la vida mejoró paulatinamente en todos los grupos con el paso del tiempo en estos pacientes libres de recurrencia postoperatoria de su cáncer esofágico.

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