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Postoperative Complications and Mortality of the Patients with Esophagectomy for Esophageal Carcinoma

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ABSTRACT : Between 1970 and 1989, 154 patients underwent esophagectomy for esophageal cancer in our department. One hundred and twenty-one patients underwent esophageal resection and reconstruction and 14 had esopahgectomy alone without reconstruction.

There were 26 operative deaths within 30 days after operation. However, the mortality rate was 29.1% during the 1970 to 1979 period, and 10.1% after 1980. Predominant postoperative complications were anastomotic leak, pneumnia, sepsis and recurrent laryngeal nerve paralysis. The rates of postoperative complications during 1970 to 1970, was 67.3% and was 43.3% after 1980. The rate of anastomotic leak was 45.4% in the former years, but it improved to 26.6% in the later period.

To prevent the postoperative complications, careful perioperative management of the patients are essential.

INTRODUCTION

Postoperative complications and mortality are still high after esophagectomy for esophageal carcinoma compared with those operations for malignant lesions of other organs[1]. Regardless of the development of the methods of diagnosis of esophageal diseases, the candidates for surgery frequently have advanced esophageal cancers. However, surgical resection for esophageal malignancies is the only method to palliate dysphagea or to obtain cure. Treatment of the postoperative complications is important to improve the operative results.

We examined the postoperative complications and mortality after esophageal resection for esophageal cancer over a period of 20 years.

PATIENTS AND METHODS

During the period from 1970 to 1989, 154 patients with esophageal cancer underwent esophagectomy with or without esophageal reconstruction. There were 129 males and 25 females with mean ages of 61 and 63 years, respectively.

These patients were divided into two groups by years. The group I(N=55) was consisted of the patients who were operated between 1970 and 1979 and the group II(N=99) included those operated between 1980 and 1989. Since 1980, intravenous alimentation, routine use of respirator managements after operation, no preoperative radiation therapy and perioperative physiotherapy were routinely performed for the surgical patients with esophageal cancer in our department. Eleven patients had Stage 0

cancers, 13 had Stage I lesions, 15 had Stage II, 41 had Stage III and 74 had Stage IV(**Table 1**). There were no differences of the stage between two groups(**Table 1**). One hundred twenty-one patients underwent esophageal resection and reconstruction simultaneously. In the group I, 27 patients or 49.1 per cent had one staged operations, while 94 patients or 95 per cent underwent one staged resection and reconstruction in the group II. Nineteen patients had staged operations in the group I. Fourteen patients with staged esophagectomy did not have esophageal reconstruction because of major postoperative complications which were related to hospital deaths(**Table 2**). We routinely performed the thoracic esophagectomy for the patients with thoracic esophageal cancers through right thoracotomy and esophageal reconstruction with the use of near whole stomach or gastric tube through retrosternal routs and esophagogastric anatomosis in the neck. However, 7 patients underwent esophagectomy without thoracotomy, because of cervical esophageal cancer or older ages or poor cardiopulmonary reserves.

Table 1. Esophagectomy for esophageal cancer (1970-1989)

— Stage —

	Stage 0	I	II	III	IV	Total
1970~1979	4	3	8	13	27	55
	(7.3)	(5.5)	(14.5)	(23.6)	(49.1)	(35.7)
1980~1989	7	10	7	28	47	99
	(7.1)	(10.1)	(7.1)	(28.3)	(47.5)	(64.3)
Total	11	13	15	41	74	154
	(7.1)	(8.4)	(9.7)	(26.6)	(48.1)	(100.0)

( ) : %

Table 2. Esophagectomy for esophageal cancer (1979-1989)

— Type of operation —

	Esophagectomy and reconstruction		Esophagectomy only	Total
	One staged	Two staged		
1970~1979	27	19	9	55
	(49.1)	(34.5)	(16.4)	(35.7)
1980~1989	94	0	5	99
	(94.9)		(5.1)	(64.3)
Total	121	19	14	154
	(78.6)	(12.3)	(9.1)	(100.0)

( ) : %

Twenty-eihght patients underwent esophagectomy with extended lymphadenectomy (triple areas dissection in the neck, thorax, and abdomen) from 1986 to 1989. The postoperative complications of the patients with extended lymph node dissection were compared with those with two areas lymph node dissection in the thorax and abdomen which was performed from 1983 till 1985. There were no differences in age, sex, tumor locatins and stages between the two groups.

RESULTS

There were 16 patients who died within 30 days after operation in the Group I(29.1%), while 10 died in the Group II(10.1%). The major causes of deaths were respiratory failure and sepsis(**Table 3**). Major postoperative complications occurred in 80 patients. In the Group I, 37 patients or 67.3 per cent had major complications after esophagectomy and 43 patients or 43.4 per cent, in the Group II. The predominant major complications were anastomotic leak, pneumonia, sepsis and recurrent laryngeal nerve paralysis in the order(**Table 4**). Anastomotic leak occurred in 20 patients or 45.4% in the Group I(13 major leak, and 7 minor), while this complication occurred in 25 patients or 26.6% in the Group II(14 major, and 11 minor leak). The major anastomotic leak was related to operative deaths or hospital deaths in 70.3% of the patients, while the patients with minor leak recovered and were discharged from the hospital(**Table 5**).

Except for recurrent laryngeal nerve paralysis, the postoperative complications such as pneumonia and pyothorax have occurred less in the Group II than in the Group I.

Anastomitic leak was high in the patients with staged operations(50%). However, there were no differences of the rates of anastomotic leaks among the patients with retrosternal route or antesternal route and those with esopohageal replacement with stomach or colon.

The operative mortality rates of the patients with extended lymph node dissection was 17.9% and the mortality rate of the patients with two areas dissection was 16%. The causes of death was respiratory failure in 4 of 5 in the extended

Table 3. Esophagectomy for esophageal cancer (1979-1989)
— Operative deaths —

	No. of patients		Total
	1970~1989	1980~1989	
Respiratory failure	8	2	10
Sepsis (empyema)	5	4	9
Caridac failure	2		2
Bleeding	1	2	3
Renal failure		2	2
Total	16	10	26

Table 4. Esophagectomy for esophageal cancer (1979-1989)
— Postoperative complication —

	1970~1979 (N=55)	1980~1989 (N=99)
Postoperative complication	37(67.3%)	43(43.4%)
Anastomotic leakage	20(45.4%)	25(26.1%)
Pneumonia, atelectasis	8(14.5%)	8(8.1%)
Respiratory failure	2	1
Pyothorax	4(7.3%)	4(4.0%)
Hemothorax	2	1
Cardiac failure	2	/
Recurrent nerve paralysis	1(1.8%)	6(6.1%)
Renal failure	/	1
Others	5	8

Table 5. Relationship between anastomotic leak and operative or hospital deaths.

		Major leak	Minor leak
Operative or hospital death	yes	19(70.3%)	0
	no	8	18

Table 6. Esophagectomy for esophageal cancer (1979-1989)
— Postoperative complications related to extent of lymph node dissections —

	Thorax and abdomen	Neck, thorax and abdomen
Postoperative complication	17(56.7%)	23(82.2%)
Recurrent nerve paralysis	1(3.3%)	6(21.4%)
Pneumonia, atelectasis	3(9.9%)	3(10.7%)
Hemothorax	1(3.3%)	1(3.6%)
Pneumothorax	1(3.3%)	0
Others	10(33.3%)	14(50.0%)

dissection group. The postoperative complications developed in 56.7% of the patients with two areas lymphadenectomy, while they occurred in 82.2% of the patients with extended lymphadenectomy(**Table 6**).

The most prominent complication in the extended dissection group was reccurent laryngeal nerve paralysis. However, this complication has decreased in these two years after the careful mainipulation of these nerves during operation.

DISCUSSION

Postoperative complications and mortality are still high in the field of esophageal surgery for esophageal cancer despite the developments of nutritional support, pre- and post-operative managements. Postoperative mortality rates were 0.8 per cent to 37.5 in the recent reports[1, 2, 3, 4]. Our mortality rate of 10.1% during these 10 years was much the same as those of other reports. Accurate preoperative staging, pre- and post-operative careful nutritional support, routine uses of mechanical support of respiraiton after operation and disuse of preoperative radiation therapy might have contributed to this improvement of mortality rates. There wrre several reports that preoperative radiation therapy increased the postoperative complications, especially pneumonia[5, 6].

Thoracic esophagectomy with mediastinal node dissection causes denervation and ischemic changes of tracheobronchial trees. These pathophysiological derangements related to depressed cough reflex, sputum retension and pneumonia[7]. We have been performing preservation of pulmonary branches of vagal nerves as much as possible, intermittent reflation and gentle manipulation of the operated side lung during operation. In addition, postoperative respiratory management with tracheal intubation make effective oxygen supply, decrease of oxygen consumption and easiness of suction of bronchial secretions.

Anastomotic leaks may be developed in the situations such as poor blood supply in the anastomotic area, considerable tension at anastomosis or technical failures. Anastomotic leaks cause the postoperative pulmonary complications in high percentage[4, 8].

The extended lymph node dissection with

esophagectomy revealed relatively high postoperative complication rates, especially recurrent laryngeal nerve paralysis[9, 10]. Pneumonia and atelectasis did not change in frequency compared with those of two areas lymph node dissection. On the other hand, the prognosis of the patients with extended lymph node dissection was better in the patients with N0 or N1 lymph nodes metastasis[11] and the patients with advanced cancers did not have merits from this extended lymphadenectomy. However, the well-controlled study may be necessary to compare the results between two areas and three areas lymph nodes dissection.

In this study, factors affecting the postoperative complications were not analized, but patients ages, type of resection, FEV1.0, and invasion to neighbouring organs were reported to be important[12]. Less traumatic operations such as extrathoracic esophagectomy might be preferred for elderly patients or compromized patients with poor cardio-pulmonary reserve in prevention of major postoperative complications[13].

The large number of patients still have advanced esophageal cancer, but postoperative complications and mortality have decreased in recent years. Also the prognosis of the patients with esophagectomy for esophageal cancer became better. In the patients who were operated in our department during 1970 to 1979, 3-years and 5-years survival rates were 15.8% and 7.9%, while in the patients between 1980 and 1989, they were 25.0% and 14.6%, respectively.

In order to improve the postoperative results of the esophagectomy for esophageal cancer, preoperative assessment of the extent of the disease and the patients condiiton, proper operative maneuvers and careful postoperative managements are important.

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