

## Aggressive Node Dissection for Esophageal Cancer

Masao TOMITA, Hiroyoshi AYABE  
and Katsunobu KAWAHARA

*The First Department of Surgery, Nagasaki University School of Medicine,  
Nagasaki, Japan.*

*Received for publication, June 25, 1990*

**ABSTRACT:** Fifty-eight patients with esophageal cancer were compared by dividing into two groups, the two-field and the three-field lymphadenectomy groups.

The modes of node involvement were estimated according to grading of the depth of cancer infiltration. When cancer infiltration extends beyond the submucosal layer, the nodes were extensively involved throughout the three fields. Therefore, an extensive lymphadenectomy is mandatory for curative operation and it is the only way to improve the surgical outcome with help of surgical techniques.

### INTRODUCTION

It is generally accepted that the surgical outcome of esophageal carcinoma was very poor because of high recurrence rates including distant metastasis. The reasons for a worse prognosis are that carcinoma of the esophagus extends cranially and caudally along the longitudinal axis due in part to rich lymph flow and easily spreads outwards the wall because of anatomical devoid of the serosa.

Needless to say, extensive lymphadenectomy is of great value to improve the surgical result.

The purpose of this study is to clarify the

validity of an extensive lymphadenectomy for carcinoma of thoracic esophagus and to know node involvement rates in accordance with tumor locations.

### MATERIAL AND METHOD

During the past 10 years from 1975 to 1985, at the First Department of Surgery, Nagasaki University School of Medicine, fifty-eight patients with esophageal cancer were surgically treated except for postoperative death. They were eligible for this study.

These patients were divided into two groups, two-field lymphadenectomy (Group 1) and three-

**Table 1.** Clinical findings according to the extent of node dissection

	two field lymphadenectomy	three field lymphadenopathy
Mean age	60.0	61.8
Sex (male: female)	23:7	24:4
Tumor location		
lu	2 ( 6.7%)	4 (14.3%)
lm	19 (63.3%)	18 (64.3%)
Ei	8 (26.7%)	4 (14.3%)
Ea	1 ( 3.3%)	2 ( 7.1%)
Total	30	28

field lymphadenectomy (Group 2). The effects of extensive lymphadenectomy to the survival in terms of metastatic rates were compared between the operative procedures of two and three-field lymphadenectomy.

The patients divided into two groups are listed in **Table 1**. The distribution of age, sex and tumor location was almost similar without statistically significant differences between two groups.

## RESULTS

Nodal involvement rates are shown in **Table 2** in accordance with tumor locations. The number of nodes and abbreviation of tumor location were followed by the rule of Japanese Society for esophageal cancer study. In the tumors located in the upper and middle portions

of thoracic esophagus, an extensive node involvement widely spreaded into the three fields was seen as shown in **Table 2**. The surgical results and postoperative complications were compared between the two groups as shown in **Table 3** and **4**.

As shown in **Table 3**, the postoperative complications occurred more frequently in the three-field lymphadenectomy group. The common complications were recurrent nerve paralysis and pneumonia which was not directly associated with the operative death. On the other hand, the rates of curative operations were enhanced by a procedure of three-field lymphadenectomy although the incidence of operative deaths in Group I was somewhat higher as compared with that in Group II or the two-field lymphadenopathy. The causes of death also represented severe complications

**Table 2.** Node metastasis rates according to tumor location

tumor location	the number of nodes													
	101	102	104	105	106	107	108	1	2	3	5	7	8	
lu (4)	25		75	25	50						25			
lm (18)	5.6	11	11	11	17	22	33	22	33		11	5.6		
Ei (4)				25		25	25	25						
Ea (2)						50	50	50						

**Table 3.** Postoperative complication

	two field dissection	three field dissection
Complication (+)	17 (56.7%)	23 (82.2%)
(-)	13 (43.3%)	5 (17.8%)
Recurrent nerve paralysis	1 ( 3.3%)	6 (21.4%)
Lung complication pneumonia	1 ( 3.3%)	2 ( 7.1%)
others	2 ( 6.6%)	1 ( 3.6%)
Hemothorax	1 ( 3.3%)	1 ( 3.6%)
Pneumothorax	1 ( 3.3%)	0
others	4 (13.3%)	0
Others	10 (33.3%)	14 (50%)

**Table 4.** Operative results

	two field dissection	three field dissection
Surgical radicality curative	16 (53.3%)	19 (67.9%)
non-curative	14 (46.7%)	9 (32.1%)
Operative death	3 (10%)	5 (17.9%)
causes of death mediasinitis	1	Dic 2
renal failure	1	pneumonitis 2
pyothorax	1	air way bleeding 1

**Table 5.** The rates of node metastasis The depth of histologic cancer invasion

depth of invasion	tumor location dissected area											
	Iu(4)			Im(18)			Ei(4)			Ea(2)		
	C	T	A	C	T	A	C	T	A	C	T	A
ep				○	○	○						
mm				○	○	○						
sm	●	●	○	○	○	○						
mp	●	●	○	○	○	●	○	○	●	○	○	○
a1				○	●	●	○	●	●			
a2				●	●	●	○	●	●	○	●	●
a3	●	●	●	●	●	●						

○meta negative    ●meta positive    C:cervical, T:thoracic A:abdominal

such as DIC and bleeding from airway.

**Table 5** shows the rates of nodal involvement according to the depths of cancer infiltration and tumor locations. It indicates that positive nodal metastasis became manifest when cancer infiltration had reached the submucosal layer and/or beyond it and a procedure of the three-field lymphadenectomy contributed to ensurance of curative operation except for a carcinoma limited to the epithelial and mucosal layers.

**DISCUSSION**

In general, the long term survival of esophageal cancer patients is not ensured even by aggressive surgery<sup>3)</sup>. The main reason for this is the high frequency of recurrence. In an attempt to improve the surgical outcome, it is emphasized that early detection is indispensable for achievement of this purpose. It is, however, not so easily feasible that recent studies focus on improved operation method and adjuvant chemotherapy. An aggressive and extensive lymphadenectomy is one of the improved procedures. Isono<sup>1)</sup> reported that postoperative relapses related to nodal involvement occurred in the upper mediastinum and para-aorta.

Recently an extensive lymphadenectomy which extends to the three fields of the neck, thorax and abdomen has become common and it enabled us to standarize.

Progress in this procedure for esophageal cancer made it possible to know substantial rates of nodal involvement. Thus it helps us investigate the extension of carcinoma in the pathogenesis.

In this study which was limited to a few patients and the short-term observation, it was concluded that cancer spreading through nodes was apparent according to the depth of cancer infiltration. In case of deep cancer infiltration beyond the mucosal layer, wide node metastasis was seen in the three fields.

Therefore, it is emphasized that an extensive lymphadenectomy is required for establishment of surgical curability. Isono<sup>2)</sup> reported that metastatic rate to the neck was as high as 24.8% and cervical lymphadenectomy is mandatory for curative operation. On the other hand, the metastatic rate to the cervical nodes rose up to 50% in the upper esophageal cancers. Therefore, an extensive lymphadenectomy is indispensable for ensurance and enhancement of surgical curability.

In contrast, even in cases of abdominal esophageal cancer, cervical node metastasis was seen in 30%.

According to the depth of cancer infiltration of the esophageal wall, the deeper cancer invades into the esophageal wall, the wider node metastasis spreads. When cancer invasion extends beyond the submucosal layer, the nodes are extensively involved.

The mostly affected nodes lay the supra-

clavicular nodes the bilateral recurrent nerve nodes, tracheal bifurcation nodes, cardiac lymph nodes and the lesser curvature nodes in the abdomen.

An extensive lymphadenectomy made by meticulous techniques might be less contributable to improvement of the surgical results. As far as efforts have been made to achieve an extensive lymphadenectomy, the results would be gradually improved and satisfactory.

## REFERENCES

- 1) Isono K, Sato H, Koike Y *et al*: Operative procedures of thoracic esophageal cancer using CUSA operation 35: 1219-1227, 1981 (in Japanese)
- 2) Isono K, Ochiai T, Okuyama K *et al*: The treatment of lymph node metastasis from esophageal cancer by extensive lymphadenectomy *J. J. Surg.* 20: 151-157, 1990.
- 3) Pradhan GN, Eng Ji Bah, Sabanathan S: Left thoracotomy approach for resection of carcinoma of the esophagus *Surgery, Gynecology and Obstetrics* 168: 49-53, 1989.