

## RESULTS ON IVOR-LEWIS ESOPHAGOGASTRECTOMY FOR 338 CASES OF CARCINOMA OF ESOPHAGUS

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Three hundred thirty-eight patients with carcinoma in the middle and lower thirds of the esophagus received Ivor-Lewis esophagogastrctomy (separate laparotomy and right thoracotomy incisions) from February 1986 to June 1992. The total resectability was 95.2%. Lymph node metastases were found in 136 cases (40.2%). Postoperative complications developed in 10.3% of the patients. No anastomotic leakage, nor postoperative (within 30 days) death and hospital death occurred. Major pulmonary complications occurred in 28.6% of the patients. The overall 1-, 3- and 5-year survival rate was 88.5% (231/261), 63.1% (125/198) and 48.4% (60/124), respectively. The 5-year survival rate was 64.1% (41/64) in patients with negative lymph nodes as compared to 31.7% (19/60) with positive nodes. The superiority of this technique was a significant improvement of the 5-year survival rate. This was due to better exposure of the operation field which made thorough dissection of lymph nodes possible, especially those along the right recurrent laryngeal nerve. Better operative exposure also provided chances for radical resection with less interference from the aortic arch. It made anastomosis easier to perform so that stenosis and leakage were less likely to occur. Ivor-Lewis esophagogastrctomy was a superior surgical procedure of choice for the treatment of cancer at the lower and middle thirds of the esophagus.

**Key words:** Esophageal tumor, Esophagectomy.

Domestic surgeons preferred a left thoracic approach or esophagectomy via upper abdominal, right posterolateral and left cervical incision which need no changing position. Three hundred thirty-eight patients with esophageal carcinoma beneath tracheal bifurcation received Ivor-Lewis esophagogastrctomy<sup>1</sup> (separate laparotomy and right thoracotomy incisions, dissection of thoracic and abdominal lymph nodes) which provided satisfactory result.

### MATERIALS AND METHODS

#### Clinical Features

There were 177 male and 161 female patients in the proportion as 1.1:1. Their ages ranged from 33 to 76 years with a mean of 52.1 years. 294 cases from middle portion (87%). 44 cases from lower portion (13.0%). Of those, 6 frequent-occurring cancers of esophagus. 3 cancers of both primary esophagus and cardia. Postsurgical stage and TNM classification<sup>2</sup> was present in Table 1.

#### Extent of Lesion

The extent of lesion of 338 cases is shown in Table 2.

#### Gross Classification

Among early esophageal cancer, there were 31 cases of erosive type, 15 cases of plaque-like type, 12

cases of polyp and 3 cases of occult type. Among advanced esophageal cancer, there were 163 cases of ulcerative type. 72 cases of medullary type. 26 cases of fungating type. 16 cases of contractive type.

Table 1. Postsurgical stage and TNM classification

TNM classification	No. of resected cases	%
0	6	1.8
I	61	18.0
IIa	136	40.2
IIb	48	14.2
III	75	22.2
IV	12	3.6

Table 2. Extent of lesion of 338 cases

Extent of lesion	No. of cases
<3 cm	89
3-5 cm	138
5-8 cm	76
>8 cm	35

### Histological Type

The histological examination of 338 cases is shown in Table 3.

Table 3. Histological type of 338 cases

Type	No. of cases
Squamous cell carcinoma	332
Adenocarcinoma	3
Small cell carcinoma	1
Undifferentiated carcinoma	1
Adenoacanthoma	1

There were 136 cases who had metastasis of lymph node (40.2%), of them, 68 cases had metastasis of lymph node along the right recurrent laryngeal nerve. Perigastric lymph nodes were positive in 65 cases.

### Methods of Operation

We chose the patients whose lesion located beneath the tracheal bifurcation by means of barium esophagogram and assessed whether the lesion could be dissected or not by understanding the extent of lesion, changement of esophageal axis and shape of the tumor. For carcinomas which were difficult to be resected, transthoracic exploration were preferred firstly. All patients underwent initial abdominal exploration through an upper middle incision. No patient had evidence of hepatic or peritoneal metastasis. The stomach was completely mobilized on the right gastric and right gastroepiploic vessels. The perigastric nodes was dissected. Pyloroplasty was performed in all cases. The abdomen was then closed and the patient was placed in the left lateral decubitus position. The right chest was opened through the fifth intercostal space. For better exposure of the operative field, the fifth costa should be cut. If the tumor might be resected, the distal esophagus should be mobilized and azygos vein was cut. The lymph nodes along esophagus, trachea, bronchus and post mediastinum were dissected, especially those along the right recurrent laryngeal nerve. The diaphragmatic hiatus was enlarged and the stomach was transposed into the thorax. The esophagectomy was then performed and esophago-gastric anastomosis was carried out at the apex of the thorax. One-layer suture anastomosis was performed.<sup>3</sup> The routine chest drainage was made and then the chest was closed.

### RESULTS

Two complications might happen in same patient, for example, trauma of the recurrent laryngeal nerve could result in pulmonary infection. 42 different complications occurred in 35 patients, the rate was 10.3% (Table 4). Pulmonary complication was the most frequently noticed complication. Respiratory failure happened in 3 patients who required tracheostomy. The next most frequent complication was gastric outlet obstruction, of them, 4 cases needed jejunostomy. Thoracic bleeding occurred in 7 cases, 3 cases needed reoperation with heal. The remaining was treated conservatively. Gastric necrosis occurred in one case. Barium esophagogram revealed perforation which was 3 cm in diameter below anastomosis. Chest drainage and jejunostomy were made with heal.<sup>3</sup> Prothorax occurred in two cases.

Pollution caused by departing the ulcerative tumor was the major reason. Chest drainage was performed with heal. No anastomotic leakage, nor postoperative (within 30 days) death and hospital death occurred in this study. The overall 1-, 3- and 5-year survival rate was 88.5% (231/261), 63.1% (125/198) and 48.4% (60/124). The 5-year survival rate was 64.1% (41/64) in patients with negative lymph nodes as compared to 31.7% (19/60) with positive nodes. TNM classification and 5-year survival were present in Table 5.

Table 4. Different complications of 42 cases

Complications	No.	%
Pulmonary complications	12	28.6
Gastric outlet obstruction	10	23.8
Thoracic bleeding	7	16.7
Trauma of the recurrent laryngeal nerve	6	14.3
Pyothorax	2	4.8
Anastomotic stenosis	1	2.4
Diphtheritic enteritis	1	2.4
Gastric necrosis	1	2.4
Arrhythmia	1	2.4
Wound dehiscence	1	2.4
Total	42	100

Table 5. TNM classification and 5-year survival

TNM classification	No. of resected cases	5-year survival	
		No.	%
0-I	21	18	85.7
IIa	43	23	53.5
IIb	19	8	42.1
III	31	10	27.0
IV	4	1	25.0
Total	124	60	48.4

## DISCUSSION

There were many surgical methods of treatment of thoracic esophageal carcinoma.<sup>4</sup> Domestic surgeons preferred a left thoracic approach or three-incision esophagectomy which needn't changing position. But this procedure was deficient in exposure of the operation field, dissection of lymph nodes and

anastomosis. The rate of anastomotic leakage and operative death were about 3%, 5-year survival rate was about 30%. During recent years, some foreign surgeons preferred dissection of three-region lymph nodes (thoracic, upper abdominal and above clavicle) via right posterolateral, upper abdominal and cervical incisions. But the rate of postoperative complications was up to 65%. Operative mortality was up to 10.4%.<sup>5,6</sup> Ivor-Lewis esophagogastrectomy (separate laparotomy and right thoracotomy incisions) was first reported in 1946.<sup>1</sup> We held it was a superior procedure of choice for the treatment of cancer at the lower and middle thirds of the esophagus. The superiority were as follows:

1. This procedure was performed using right posterolateral approach which provided better operative field, less interference from the aortic arch and higher resectability. This study indicated that the total resectability was 95.2%. Because most surgeons are right-handed, this procedure only took about 15 minutes. Neither anastomotic leakage nor postoperative death occurred.

2. This procedure provided better exposure of the operation field, thorough dissection of thoracic and abdominal lymph nodes, especially those along the right recurrent laryngeal nerve. The rate of lymph node metastases in this region was higher,<sup>7</sup> Baba emphasized the dissection of lymph node in this region.<sup>6</sup> In this study the rate was 20.1%. Via left posterolateral incision. The lymph nodes of this region couldn't be dissected. Domestic document revealed the 5-year survival rate of postsurgical esophagectomy in patients with positive nodes was only 12.6-19.7%.<sup>8,9</sup> By comparison, the 5-year survival rate of patients with positive nodes was 31.7% in this study. In order to increase the 5-year survival rate, it was necessary for patients with positive lymph nodes to be dissected in thoracic and abdominal region.

3. This procedure provided less injury and low rate of complications compared with three-incision operation. Because the apex of right thorax was higher than that of left thorax. Resection and anastomosis were carried out at the apex of right thorax, and the length of resected esophagus was enough. Only one patient who had anastomotic stenosis needed postoperative esophageal dilation.

The drawback of this procedure was needing changing position during operation, but this took 6 to 8 minutes. Gastric outlet obstruction was signifi-

cantly less frequent than before by prophylactic pyloroplasty, enlarging the diaphragmatic hiatus and preventing transformation of gastric axis during anastomosis.

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