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Transhiatal Esophagectomy for Palliative Treatment of Advanced Esophageal Carcinoma

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Abstract : **The decision for palliation or curative treatment of esophageal carcinoma is based on the staging of the tumor and the patient's nutritional status. Poor status patients in the advanced stage may not tolerate the radical en block dissection. Transhiatal Esophagectomy (THE) has been advocated for palliation due to a lower respiratory complication rate as opposed to tumor resection via thoracotomy. This article reviews the results of THE in advanced esophageal cancer patients in Songklanagarind Hospital.**

Materials and Methods : **Esophageal carcinoma patients who underwent THE were studied, and the tumor characteristics, tumor staging and the results of operation were analyzed. The overall outcomes of the palliative surgery were reported.**

Results : **From August 1985 to February 1997, fifty seven esophageal carcinoma patients were operated by THE at Songklanagarind Hospital. The average ages were 63.77 years in male patients and 69.36 years in female patients. The tumors were 1 case (1.75 %) , 8 cases (14.04 %), 25 cases (43.86 %), 21 cases (36.84 %), and 2 cases (3.51 %) in cervical, upper thoracic, mid thoracic, lower thoracic and esophagogastric respectively.**

The average time for operation was 227.11 ± 48.73 minutes. Intraoperative blood loss was 500 ± 317.52 ml. Operative death occurred in 6 cases, and hospital death occurred in 2 cases. Massive postoperative bleeding led to death occurred in one case. Pneumonia and respiratory failure were the causes of death in 2 cases. The incidence of anastomotic leakage was 5 cases (8.77 %). Stricture of the anastomosis was detected in 7 cases (12.25 %). There was no tracheal lacerations during dissection. The average postoperative hospital stay was 24.75 days.

Conclusion : **The overall results, morbidity and mortality for palliative treatment of esophageal carcinoma by THE were presented. Respiratory tract complications and stricture of anastomosis were the common complications. There was no evidence of vital organ injuries during operative dissection, but there was one case of postoperative massive bleeding resulting in death. THE can be an alternative simple procedure for palliation of advanced esophageal carcinoma.**

Key words: **Transhiatal esophagectomy, esophageal carcinoma.**

Controversy still exists between radical or palliative surgical treatment of esophageal cancer. Radical en bloc resection of the tumor and associated lymph nodes improves the survival outcome in cases when the tumor extends to the submucosa or muscular propia.[1-5] Akiyama[6] reported evidence of lymph node spread in relation to tumor extension. Lymph node dissection in adjacent areas has resulted in prolonging life. Locoregional recurrence or distant metastasis within a short period after surgical resection is unpredictable when selecting an alternative procedure instead of radical dissection.[7] Limitation of radical dissection was influenced by the patient's age and nutritional status prior to the operation. Pulmonary and anastomotic complications in these patients are important factors in patient survival.

Transhiatal esophagectomy (THE) without thoracotomy for palliative treatment of esophageal carcinoma became a popular procedure after Orringer reported it in 1984.[8] Resection of the esophagus without thoracic incision is the advantage of THE for the relief of dysphagia. However, blunt dissection of the esophagus in the mediastinum by a blind technique may carry considerable risk. Tracheo-broncheal injury or massive bleeding from blind dissection may invariably happen in certain case situation. This article reviews the operative results, complication and mortality in esophageal cancer patients treated by THE.

Materials and Methods

Esophageal carcinoma patients underwent THE in Songklanagarind Hospital from August 1985 to February 1997 were studied. Indications for THE were preoperative respiratory problems or advanced stage of disease. Esophagoscopy and bronchoscopy were routinely performed as part of the preoperative evaluations to exclude airway invasion by advanced tumor. Gross tumor invasion to the posterior wall of the trachea or bronchus detected by bronchoscopy was an absolute contraindication for THE.

The operative technique began with mobilization of the stomach through an upper midline abdominal incision. The right gastric and right gastroepiploic vessels were preserved. The left gastric artery was transected, and gross lymph nodes seen around the vessel stump were removed. The esophagogastric junction with part of the lesser curvature of the stomach were resected including the surrounding lymph nodes. The lower end of the esophagus was clamped to aid in applying traction during the dissection technique, and Kocherization of the duodenum was performed.

The cervical esophagus was mobilized via a left oblique neck incision at the anterior border of the sternocleidomastoid muscle. Dissection was performed while avoiding injury to the left recurrent laryngeal nerve. The esophagus was transected 1-2 cm below the esophageal inlet. The esophageal stump was clamped and blunt dissection was carried out from thoracic inlet to the mediastinum. Meticulous dissection was exercised while dissecting between the esophagus and the membranous part of trachea.

The diaphragmatic hiatus was dilated with the surgeon's hand until blind dissection by hand could be performed easily in the mediastinum. The esophagus and the tumor were freed from the surrounding tissue and removed through the hiatus. The mediastinum was then examined for active bleeding or pleural tears.

The fundus of the stomach was pulled to the neck and anastomosed to the cervical esophagus via the posterior mediastinal route. Anastomosis was performed with 3-0 vicryl, interrupted sutures. A nasogastric tube was placed passing through the anastomosis. Skin closure in layers was done without the use of drain. Patients were observed clinically for symptoms suggesting of anastomotic leakage, and esophageal integrity was confirmed 7 days postoperatively by radiography with patients swallowing water soluble contrast media. Tumor characteristics and the results of operation were analyzed according to the amount of blood loss, operative time, complications, operative deaths and hospital deaths.

Results

A total of 57 cases of esophageal cancer patients were operated by THE. There were 43 male and 14 female patients. The average age in males was 63.77 years and in females 69.36 years. Locations of tumor included: one case at the cervical esophagus (1.75 %), 8 cases at the upper thoracic part (14.04 %), 25 cases at the middle thoracic part (43.86 %), 21 cases at the lower thoracic part (36.84 %), and 2 cases at the

esophagogastric junction (3.51 %). The mean operative time was 227.11 ± 48.73 minutes. The average blood loss was 500 ± 317.52 ml.

There were 5 cases of leakage of the anastomosis. Two of these patients died in the hospital. Two cases recovered after conservative treatment. The fifth case died following an unsuccessful reoperation with colon interposition.

Table 1 Causes of operative death

Causes of death	Numbers
Pneumonia with respiratory failure	2
Anastomotic leakage and collection	2
Myocardial infarction	1
Massive bleeding	1

Table 2 Complications of the transhiatal esophagectomy

Complication	Numbers (%)
Stricture anastomosis	7 (12.25%)
Anastomotic leakage	5 (8.77%)
Pneumonia	3 (5.26%)
Empyema	2 (3.51%)
Myocardial infarction	2 (3.51%)
Hiatal hernia	1 (1.75%)
Chylothorax	1 (1.75%)
Respiratory failure	1 (1.75%)

Operative death within 30 days postoperation occurred in 6 cases. Causes of death were myocardial infarction in one case, massive bleeding in one case, anastomotic leakage in 2 cases, and pneumonia with respiratory failure in 2 cases (Table 1). There were 2 patients who died but had survived longer than 30 days. One case died as a result of complication from leakage of the anastomosis. Postoperative complications are shown in Table 2. Stricture of anastomosis necessitated dilatation was the most common complication with an incidence of 7 cases (12.25 %). Average postoperative hospital stay was 24.75 (8-133) days. Pathological staging in this group of patients is shown in Table 3 by standard TNM classification. Tumor stage I was found in one patient and classified as T1 without a lymph node resection specimen. Most of the cases were in stage II (II A 31 cases, II B one case). Nineteen cases were in stage III, and 3 cases were stage IV. There were 2 cases with no residual tumor after preoperative combined radiation and chemotherapy.

Discussion

The reported survival rate after resection of esophageal carcinoma varies greatly according to the literature. The resectability rate and survival outcomes in high incidence areas such as Japan or The People's Republic of China were better than those reported elsewhere. Extensive review of results of treatment in stage 0 and stage I esophageal carcinoma in The People's Republic of China by Li and Yao showed a 5-

Table 3 Staging of tumor, based on TNM classification

Stage	TNM classification	Numbers
no residual tumor*		2
at least I	T1 NA MO	1
at least IIA	T2 NA MO	2
	T3 NA MO	29
IIB	T2 N1MO	1
III	T3 N1 MO	17
	T4 N1 MO	2
IV	any T, any N, M1	3
	Total	**57**

***preoperative radiation and chemotherapy**

year survival rate of 95 per cent and 89 per cent respectively.[9] In Japan the 5-year survival rate in patients with mucosal cancer was approximately 80 per cent.[10]

We had previously reported an overall resectability rate of about 50 per cent and an overall median survival of about one year.[11,12] Esophageal exclusion technique was also performed but this was terminated shortly due to multiple serious complications.[13] This operation was performed in patients with airway fistula but was required to combine with Kirchner's operation.[14] Recently THE has become an alternative modality for our patients in palliative treatment resulting in an operative time of 227.11 ± 48.73 minutes. The literature reports operative times of about 2.2-5.75 ± 1.9 hours in THE.[15-19] Fok[16] and Chu[17] also reported a significantly lower operative time using THE than with transthoracic esophagectomy.

The amount of intraoperative blood loss averaged 500 ± 317.52 ml. There was no active bleeding or tracheal laceration that indicated a need to convert from a blind dissection to open thoracotomy for control of vital organ injuries. Leakage of the anastomosis was one of the common complications following an esophagectomy. We likewise found that the incidence of anastomotic leakage in this group was 8.77 per cent (5 cases). Collection and sepsis from anastomosis leakage was the cause of operative death in 2 patients. There was one hospital death following re-anastomosis which was performed after conservative treatment of anastomotic leakage failed. The other 2 cases survived after conservative treatment.

The mortality rates following esophageal carcinoma treatments using THE and transthoracic resection are frequently compared. These comparative results have generally indicated no difference in the outcome in term of mortality. This may be due to different patient selection method for either THE or transthoracic resection. For example patients with preoperative respiratory tract problems usually received THE. The postoperative mortality in the THE group was about 10-15 per cent.[20-23] Bolton, et al reported no mortality after THE in low ASA score patients.[24] In this report, operative death occurred in 5 cases, and hospital death occurred in 2 cases. The overall mortality (7 cases) was 12.28 per cent. A comparative study between THE and transthoracic esophagectomy by Fok demonstrated no difference in mortality rates associated with these operations with the exception that THE had an advantage in patients with respiratory problems.[16]

Tumor recurrence following resection of esophageal carcinoma in the advanced stage is generally detectable within one year.[7,25] Chu also reported a non-significant difference in survival rate in the prospective randomized comparison of THE and transthoracic esophagectomy in the same stage of disease.[17] The results are also similar in areas of high incidence of esophageal adenocarcinoma.[18,26,27] Tumor staging of cases in this study mostly involved tumors of advanced stage. This suggested that palliation for advanced esophageal carcinoma may be better managed with a less invasive technique than transthoracic esophagectomy. Serious complications following operation, especially respiratory and cardiac problems, were also the common complications in this study.

Esophagogastric anastomotic stricture was reported elsewhere with a rate of about 9-27 per cent.[28,29] The stricture outcome in our report was also a common complication, 12.25 per cent. The obstructive symptom responded very well to dilatation.

Herniation of visceral organs through the diaphragmatic hiatus is an uncommon complication. We experienced one case of such complication in this report. This may be the result of over-dilatation of the hiatus. The postoperative chest film showed a loop of bowel present in the mediastinum. To prevent this situation, is to transfix the stomach with seromuscular sutures to the surrounding tissue at the hiatal area. The patient was re-explored to reduce the hiatal hernia, and transfix sutures were placed to prevent reherniation.

Chylothorax developed in one case in which THE was performed after preoperative radiation of the cancer in the mid-thoracic part. Conservative therapy of two-week duration was unsuccessful, and a thoracotomy proved necessary in order to ligate the injured thoracic duct.

Pathological staging of the malignant tumor was an important factor in performing the palliative procedure. Other factors include poor nutritional status due to inadequate intake resulting from tumor obstruction, older patients and respiratory problems. The classification of primary tumor were one case of T1 (submucosa), 3 cases of T2 (tumor confined in

muscular layer), and 56 cases of T3 (tumor beyond muscular layer). The lymphnode in the lymphatic draining area of the esophagus were not removed due to the blind nature of dissection in the mediastinum. Thus, early recurrence is common in the advanced cases like most patients in this report.[7]

Postoperative hospital stay in this group averaged 24.75 days. A longer hospital stay reflected the condition that required additional medical support, especially in complicated cases.

Conclusion

In the advanced stage of esophageal carcinoma, palliative treatment by THE is a surgical intervention with comparable outcome and complications when compared to other transthoracic approaches. Respiratory tract complication and stricture of the esophagogastric anastomosis were the most common post-THE complications. Careful blind dissection of the esophageal cancer lesion in the mediastinum can minimize the incidence of any adjacent vital organ injuries.

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