

chapter 43 – PRIMARY SURGERY FOR ADENOCARCINOMA OF THE ESOPHAGUS

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The treatment of choice for patients with esophageal adenocarcinoma is controversial. Although esophagectomy remains the standard of care, its role has been challenged owing to the generally poor outcomes after surgical resection alone.^[1,2] A survey of the patterns of care for esophageal cancer in the community using the American College of Surgeons National Cancer Database examined the modalities of treatment offered to more than 5000 patients in over 820 hospitals across the United States in 1994.^[3] This study, reported in 2000 by Daly and colleagues, showed that surgical resection as a primary modality of therapy was offered to only 43% of patients with esophageal adenocarcinoma clinically staged as stages I, II, and III. The majority of the remaining patients underwent definitive chemotherapy or chemoradiation therapy followed by a planned surgical resection.^[3] A more recent pattern of care survey showed that 56% of over 11,000 patients with esophageal cancer received chemoradiation therapy with curative intent (Suntharalingam et al, 2005).^[4] In an additional 33% of patients, chemoradiation therapy was given prior to a planned esophagectomy. These findings suggest that treatment options offered in the community to patients with esophageal cancer have, to a large extent, at least in the United States, discounted primary surgical resection in favor of combined modality therapy with or without a subsequent esophagectomy. The use of such measures, often outside the realm of controlled clinical trials, is not supported by the results of most randomized trials that have yet to show a survival advantage for preoperative chemoradiation therapy followed by esophagectomy over esophagectomy alone, particularly in patients with adenocarcinoma of the esophagus.^[5,6] Additionally, there is considerable controversy within the surgical literature as to what represents the appropriate operation for patients with esophageal cancer, regardless of cell type. The debate focuses primarily on the need for, and the extent of, lymph node dissection during the conduct of esophagectomy for cancer. In the following discussion I attempt to outline the various surgical strategies and their impact on survival and disease recurrence, focusing on patients with adenocarcinoma.

TRANSHIATAL ESOPHAGECTOMY

Transhiatal esophagectomy is one of the more common techniques for esophagectomy in North America and Europe. In the previously mentioned survey by the American College of Surgeons, transhiatal esophagectomy was performed in 25% of patients with carcinoma of the distal third of the esophagus.^[3] As described elsewhere in this textbook, the procedure entails extirpation of the intrathoracic esophagus without a thoracotomy and advancement of the esophageal substitute, usually a greater curvature gastric

tube, to the neck for reconstruction. The extent of nodal dissection with this operation is essentially limited to the periesophageal nodes and those perigastric nodes along the cardia and lesser gastric curve. The largest single experience with transhiatal esophagectomy is that of Orringer and associates, who reported on 800 patients with cancer of the intrathoracic esophagus and cardia (Orringer et al, 1999).^[7] Adenocarcinoma was present in 69% of the patients, while 28% had epidermoid cancer. Hospital mortality was 4.5%, and morbidity was 27%. Major complications included anastomotic leaks (13%), recurrent laryngeal nerve injury (7%), wound infection (3%), pulmonary complication (2%), bleeding, and chylothorax (1% each). Overall survival at the 2-, 3-, and 5-year marks was 47%, 34%, and 23%, respectively. Five-year survival was 59% for patients with stage I disease and 22% for patients with stage IIA disease. Patients with stage III disease had 2- and 5-year survival rates of 32% and 10%, respectively. There was an overall statistically significant survival advantage for patients with adenocarcinoma (24% versus 17%). This study by the University of Michigan group is considered the benchmark for transhiatal esophagectomy and represents the best expected outcome after transhiatal resections for carcinoma. However, it is clear from reviewing the literature that these survival rates are quite consistent with the experience of most surgeons who practice a similar approach. Gelfand and coworkers reported on 160 patients who underwent transhiatal esophagectomy for carcinoma of the lower esophagus and cardia.^[8] Most tumors were adenocarcinoma, and most were in earlier stages. Survival rates at 2 years and 5 years were 40% and 21%, respectively.

Gertsch and associates reported on 100 patients with esophageal carcinoma who were uniformly treated with trans-hiatal esophagectomy without adjuvant therapy over a 10-year period.^[9] Hospital mortality was 3%, and morbidity was 68%. The median survival was 18 months, and the overall 5-year survival was 23%. There was no difference in survival between patients with adenocarcinoma compared with those with squamous histology. Survival was better for T1 and T2 tumors (63% 5-year survival). Vigneswaran and colleagues reported on the results after transhiatal esophagectomy in 131 patients, the majority of whom had adenocarcinoma. Operative mortality was 2%. Overall 5-year survival was 21%. Patients with stage I disease had a 47.5% 5-year survival compared with patients with stage III disease, whose 5-year survival was 5.8%. Patients with adenocarcinoma had a 5-year survival of 27%, whereas not a single patient with squamous cell cancer was alive at the 5-year mark.^[10]

A few studies reported the local recurrence rates after transhiatal resection. Urba and coworkers reported the results of a randomized trial comparing transhiatal esophagectomy alone to transhiatal esophagectomy after induction chemoradiotherapy.^[5] More than 75% of patients in both study arms had adenocarcinoma. From a statistical point of view, overall survival and disease-

free survival were not significantly different within the two arms of the study. Overall survival and disease-free survival were both 16% for the transhiatal esophagectomy alone. Overall survival and disease-free survival were 30% and 28%, respectively, for transhiatal esophagectomy after induction chemoradiation therapy. Local recurrence as a component of treatment failure occurred in 42% of patients in the surgery alone arm versus 19% in the combined modality arm. This figure is almost identical to the local failure rate reported by Barbier and colleagues, who used serial CT to evaluate prospectively the recurrence rate in 50 patients who underwent transhiatal resection for cancer.^[11] Local recurrence was detected in 39% of patients. More recently, Hulscher and associates reported a locoregional recurrence rate of 37% among 137 patients, 95 of whom had adenocarcinoma, treated by transhiatal esophagectomy without preoperative therapy.^[12]

In summary, it appears that for patients with esophageal adenocarcinoma, transhiatal esophagectomy can usually be performed with an operative mortality of 5% or less in the hands of experienced esophageal surgeons. Five-year survival rates are generally in the 20% to 25% range. Survival for patients with stage I tumors is in the 60% to 70% range, whereas patients with stage III disease have a 5% to 10% 5-year survival. Finally, the procedure is associated with failure to control or eradicate local disease in nearly 40% of patients.

STANDARD TRANSTHORACIC ESOPHAGECTOMY

Transthoracic esophagectomy is probably the most widely performed operation for cancer of the esophagus worldwide. In the United States, nearly 60% of all surgically treated tumors of the lower third of the esophagus are performed using a transthoracic approach.^[3] The procedure can be carried out through a right or left thoracotomy, depending on the preference of the surgeon and the location of the tumor within the esophagus. Generally, a right thoracotomy is required for adequate exposure of tumors in the middle or upper thirds that are anatomically intimately related to the membranous trachea or the arch of the aorta. Tumors located at the gastroesophageal junction or in the lower third of the esophagus can usually be approached through a left thoracotomy incision combined with a left phrenotomy or, alternatively, with a left thoracoabdominal incision. Regardless of the side of the thoracotomy, the extent of lymph node dissection is usually limited to the immediate periesophageal, cardial, and perigastric nodes.

One of the largest experiences in North America with this approach is that of Ellis and coworkers (Ellis, 1999).^[13] These authors reported their experiences with nearly 500 patients who received a transthoracic esophagectomy employing standard surgical techniques. One third had squamous cell carcinoma, whereas the majority had adenocarcinoma of the esophagus or

gastroesophageal junction. Hospital mortality was 3.3%. Complications occurred in 34% of patients. Overall 5-year survival including operative mortality and non-cancer-related deaths was 24.7%. Patients who had a complete (R0) resection had a 5-year survival of 29%, whereas no patients with either residual microscopic (R1) or macroscopic disease (R2) survived 5 years. Median and 5-year survival for patients with adenocarcinoma was 18 months and 25%, respectively. The corresponding figures for squamous cell cancers were 18 months and 20%, respectively, and were not statistically different from those for adenocarcinoma. Five-year survival was 79% for patients with stage I disease, 38% for those with stage IIA, and 27% for those with stage IIB. Patients with stage III disease had a 3- and 5-year survival of 20% and 13.7%, respectively.

This series by Ellis is generally representative of the results achievable using this surgical technique in many esophageal centers across the United States. For example, a recent study from the Mayo Clinic reported on the results after transthoracic esophagectomy in 220 patients, of whom 188 had adenocarcinoma.^[14] Notwithstanding, an impressively low hospital mortality and morbidity (1.4% and 37%, respectively), the survival rates remained essentially similar to those reported by Ellis nearly a decade previously. Overall 5-year survival was 25% and survival at 5 years for stages I, IIA, IIB, and III was 94%, 36%, 14%, and 10%, respectively. A review of some of the surgical series reported within the past decade from North America and Europe is shown in Table 43-1 (Ellis, 1999; Putnam et al, 1994).^[13-21] Resectability rates ranged from 60% to 90% and hospital mortality rates ranged from 3.2% to 23%. Five-year survival rates varied between 9% and 24%. The variability in rates of resectability, hospital mortality, and 5-year survival more than likely represents inherent differences in patient selection, surgical expertise, and the retrospective nature of nearly all of these studies. More instructive to review are the survival results achieved by the surgical arms of randomized trials comparing various preoperative regimens to surgical resection alone.

TABLE 43-1 -- Transthoracic Esophagectomy for Esophageal Cancer

Author (Year)	No. Patients	Cell Type	Hospital Mortality (%)	5-Year Survival (%)	Median Survival
Hofstetter et al ^[20] (2002)	994	A/S	7	34 (3 yr)	20 mo
Visbal et al ^[14] (2001)	220	A/S	1.4	25.2	1.9 yr

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