Esophageal Cancer Surgery in Elderly Patients 80 Years of Age or Older

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Abstract

As society ages, the elderly are increasingly affected by esophageal cancer. We reviewed the data of the elderly patients 80 years of age or older, who underwent surgery for esophageal cancer to evaluate the safety of surgery in this particular patient population. Nine patients aged 80 or above who underwent surgery for esophageal cancer in our department between 1999 and 2009 were included in this study. We analyzed their preoperative assessment, concurrent disorders, surgical techniques, postoperative course and complications. The patients’ mean age was 82 years. Four patients had concurrent hypertension, two had concurrent diabetes, two had concurrent cerebral infarction, and two had undergone a malignant tumor operation. Three had obstructive pulmonary dysfunction, one had restrictive pulmonary dysfunction, and one had mixed pulmonary dysfunction. Clinical stage of esophageal cancer was graded as Stage I in one, Stage II in five, and Stage III in three patients. Four patients underwent esophagectomy with right thoracotomy and two-field lymph node dissection (LD), one underwent esophagectomy with right thoracotomy and three-field LD, one underwent esophagectomy with left thoracoabdominal incision and two-field LD, one underwent esophagectomy with left thoracotomy and two-field LD and two underwent transhiatal esophagectomy. Postoperative complications occurred in seven patients; however, no severe pneumonia or anastomotic leakage was noted. All patients were discharged with improved conditions. The mean postoperative hospital stay was 33 days. Esophageal cancer surgery can be performed safely in the oldest of elderly patients with appropriate preoperative assessment, selection of the optimal surgical technique, and pre- and postoperative patient management.

Key Words: Esophageal cancer, Esophageal cancer surgery, Elderly patients

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cplasty for pulmonary tuberculosis in one patient and right upper lobectomy for lung cancer in the other patient), and two patients had previously undergone surgery for another malignancy (sigmoid colon cancer in one and lung cancer in the other). Six patients had two or more concurrent disorders.

2. Respiratory function and nutritional status (Table 1)

The preoperative respiratory function test revealed mixed pulmonary dysfunction in Patient 1, who had undergone thoracoplasty for pulmonary tuberculosis, obstructive pulmonary dysfunction in three patients (Patients 2, 3 and 5), and restrictive pulmonary dysfunction in one patient (Patient 4).

The nutritional status was assessed using Onodera’s prognostic nutritional index [PNI; 10 × serum albumin (g/dL) + 0.005 × peripheral lymphocyte count (μL)]\(^5\). Two patients had malnutrition, defined as a PNI of less than 40 (Patients 8 and 9).

3. Tumor location and clinical stage (Table 2)

Six patients had a tumor in the middle thoracic esophagus (Mt) and three patients had a tumor in the lower thoracic esophagus (Lt). Esophageal cancer was graded according to the Guidelines for Clinical and Pathological Studies on Carcinoma of the Esophagus (10th edition)\(^6\), and one patient had Stage I cancer, five had Stage II cancer, and three had Stage III cancer. The majority of patients had progressive cancer. Two patients underwent preoperative chemotherapy.

4. Operative procedures (Table 2)

Transhiatal esophagectomy was performed in two patients. Subtotal esophagectomy with thoracotomy was performed in seven patients: right thoracotomy in five patients and left thoracotomy in two patients, one of whom had undergone surgery for a right lung cancer. Concerning the reconstruction route and lymph node dissection, the posterior mediastinal route (intrathoracic anastomosis) and two-field lymph node dissection were performed in four patients, the posterior mediastinal route with left thoracotomy and two-field lymph node dissection were performed in one patient. Antethoracic route and two-field lymph node dissection were performed in one patient, and a retrosternal route and three-field lymph node dissection were performed in one patient.

5. Postoperative complications (Table 2)

Postoperative complications occurred in seven patients (77.8%). Arrhythmia and postoperative delirium each occurred in two patients. Pneumonia, chylothorax, recurrent nerve paralysis, ileus, anastomotic stenosis, pseudomembranous colitis, and hyperbilirubinemia each occurred in one patient. However, no patients had severe pneumonia or anastomotic leakage. All complications were resolved with conservative management.

Two patients (Patients 1 and 4) had a %VC of less than 80%, which we determined to be a risk factor for the development of postoperative complications\(^4\). While both patients had postoperative complications, a lung complication (pneumonia) occurred only in Patient 1 who had...
mixed pulmonary dysfunction. Postoperative complications occurred in two of three patients with malnutrition. All of the complications, none of which were nutrition-related, were resolved with conservative management.

6. Prognosis (Table 2)
No death occurred in association with surgery in the present study. All patients were discharged or transferred to another hospital with improved conditions. The mean postoperative hospital stay was 33 days. The shortest stay was 26 days, and the longest was 51 days. The cumulative survival frequency was 100% at one year, 55% at three years, and 55% at five years following surgery (Fig. 1). Three patients died during the postoperative follow-up period; two died due to the primary disorder and one due to pneumonia. The two patients who died of the primary disorder each survived for more than 300 days.

Discussion
The diagnostic and treatment guidelines for esophageal cancer define surgery as the standard treatment for Stage I to III (T1b to T3) esophageal cancer\textsuperscript{7}. Many elderly subjects have age-related organ dysfunctions or concurrent disorders. Because esophageal cancer surgery is highly invasive, patients who are indicated for surgical treatment should be carefully selected. The World Health Organization defines elderly people as those aged 65 years or older. With advancing strategies for postoperative patient management, however, surgery is often selected even for patients at 80 years of age or older. We must avoid casually selecting palliative treatment only on the basis of a patient’s advanced age.

Esophageal cancer is highly sensitive to chemoradiation. Studies have revealed that the average two-year survival rate is 93% in patients with Stage I cancer\textsuperscript{8}, and the three-year survival rate is 40% to 50% in patients with Stage II or III cancer\textsuperscript{9}, which are equivalent to the postsurgical survival rate. Chemoradiotherapy may therefore be considered to be a suitable treatment for elderly patients, patients with concurrent disorders, and those who wish to preserve their esophagus. However, no study has been conducted to directly compare chemoradiotherapy with surgery. Certain complications are inherent to radiation therapy\textsuperscript{10, 11}. One study reported that esophagectomy was associated with a significantly better patient prognosis and an equivalent frequency of complications compared with radical chemoradiotherapy in elderly patients with Stage II or III esophageal cancer\textsuperscript{12}. Surgery is therefore regarded as the first-line treatment for the disease in our department.

We reviewed the data of nine esophageal cancer patients aged 80 or above who underwent surgery in our department in the past 11 years to determine the optimal strategy to safely perform surgery in elderly patients. All patients had a PS of 0 or 1, lived independently, understood their illness and wished to undergo surgery. The majority of patients had concurrent disorder(s), primarily hypertension, diabetes and cerebral infarction, which were controlled with medical treatment. Two patients (22.2%) had undergone surgery for other malignancies. Having concurrent disorders or malignancy is a typical finding in elderly patients.

Five patients (55.6%) had obstructive or restrictive pulmonary dysfunction associated with age or concurrent disorders. Two patients (22.2%) were determined to be nutritionally-depleted based on Onodera’s PNI. We provided our patients with preoperative pulmonary muscle training and respiratory physical therapy to improve their pulmonary function. Nutritionally-depleted patients were instructed to take oral nutritional supplements if they were able to eat or were treated with an intravenous hyperalimentation or fat emulsion infusion to improve their nutritional status before surgery.

Postoperative complications can be fatal in elderly patients with decreased organ functions, physical strength and reserve. The appropriate surgical technique should be selected as well as providing pre- and postoperative patient management to prevent complications. The prognoses of patients who undergo esophageal cancer surgery are primarily affected by pulmonary complications and anastomotic leakage.

We follow certain strategies to prevent pulmonary complications and anastomotic leakage in our department. Operative procedures are selected for individual patients based on assessments of the cancer progression and PS. It is important to use a uniform protocol for standard surgeries determined based on tumor progression\textsuperscript{13, 14} in elderly patients to ensure definitive local control. The aggressive lymph node dissection around the recurrent laryngeal nerve and the trachea and bronchus, which may include excessive invasion, is minimally performed.
Transhiatal esophagectomy that involves no thoracotomy or upper mediastinal lymph node dissection was selected for patients with mixed pulmonary dysfunction. Intrathoracic anastomosis and two-field lymph node dissection was selected for patients with no obvious cervical lymph node metastasis as indicated by the preoperative scan. Right thoracotomy and three-field lymph node dissection had to be selected for one patient with advanced cancer that had spread to the upper thoracic esophagus (Ut), multiple concurrent disorders and restrictive pulmonary dysfunction. Postoperative management of the patient was somewhat difficult due to the development of delirium, recurrent nerve palsy and mild chylothorax. However, the patient improved with conservative management and was discharged on the 51st postoperative hospital day.

Our strategy to prevent anastomotic leakage included: 1) construction of a thin and long gastric tube 3.5 cm in diameter, which ensures a good blood supply, along the greater curvature, 2) end-to-side esophagogastrectomy using a 25-mm circular stapler, and 3) covering the anastomotic lines with an omentum. We also provided preoperative respiratory muscle training, pulmonary physical therapy and oral care in conjunction with the dental care services to prevent pulmonary complications to all patients, and not just elderly patients scheduled for esophageal cancer surgery. Furthermore, treatment with steroids and neutrophil elastase inhibitors is provided as a part of perioperative patient care, because these drugs are known to reduce inflammatory cytokines and decrease the incidence of pulmonary complications.

None of the nine elderly patients with esophageal cancer treated at our department had serious pulmonary complications or anastomotic leakage, or died in association with surgery due to our optimal selection and use of surgical technique and careful pre-and postoperative patient management. The mean postoperative hospital stay was short, at 33 days. While two patients died of the primary disease, they each survived for greater than 500 days. Their prognoses improved due to surgery. Therefore, no patient had recurrence of cancer or died at an early time after surgery. An improved patient prognosis can therefore be expected even in elderly patients as long as they are perioperatively well-managed.

In summary, esophageal surgery can be performed safely, even in the elderly patients 80 years of age or above, if the preoperative PS assessment is accurate, an optimal surgical technique is selected to prevent pulmonary complications and anastomotic leakage, and pre-and postoperative patient management are ensured.

References