Formosan Journal of Surgery (2015) 48, 121–127

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-fjs.com

ORIGINAL ARTICLE

Radical esophagectomy in elderly patients with esophageal cancer

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Received 25 March 2015; received in revised form 25 May 2015; accepted 14 July 2015
Available online 14 September 2015

KEYWORDS
elderly;
esophageal cancer;
esophagectomy

Abstract *Background:* The increasing lifespan of the aging population has resulted in an increased number of elderly patients with esophageal cancer.
Purpose: This study was conducted to determine the effects of age on outcomes following surgery in elderly patients with esophageal cancer.
Methods: Patients with esophageal cancer who received curative esophagectomy between January 2001 and December 2012 were enrolled in this study. The patients were divided into two groups according to their age at diagnosis: Group 1 comprised patients aged ≥70 years and Group 2 comprised patients aged <70 years. Perioperative variables, the length of hospital stay, rates of surgery-related morbidity and mortality, and survival outcomes were analyzed and compared between the two groups.
Results: The study comprised 185 patients, with 39 patients in Group 1 and 146 patients in Group 2. Perioperative variables, namely pulmonary function, chemoradiotherapy, length of intensive care unit stay (4.5 days vs. 3.1 days), and hospital stay (30.2 days vs. 21.6 days), were significantly different between the two groups. The patients in Group 1 showed higher mortality (7.7% vs. 3.4%) and morbidity (46.1% vs. 29.5%) compared with those in Group 2, with no statistical significance. Cardiopulmonary-related complications (30.8%) following esophagectomy were most frequently observed in elderly patients. With less intensive chemotherapy and/or radiotherapy, the overall survival of the patients in Group 1 was prolonged compared with that of the patients in Group 2 (15.8 months vs. 13.7 months, $p = 0.44$). Esophagectomy followed by chemoradiotherapy did not yield more positive outcomes than those of esophagectomy alone in patients in Group 1.

Conflicts of interest: The authors have no conflicts of interest.

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http://dx.doi.org/10.1016/j.fjs.2015.07.001

Conclusion: Esophagectomy in elderly patients with esophageal cancer can yield an acceptable outcome and fewer complications than esophagectomy in younger patients. Although reserved physiological functions are typically limited in elderly patients relative to younger patients, elderly patients with resectable esophageal cancer should not be denied esophagectomy.

1. Introduction

Esophageal cancer is a highly fatal disease.[1,2] Esophagectomy is commonly accepted as a local curative treatment for esophageal cancer and offers an opportunity for long-term survival.[1,3,4] Because of the globally increasing life expectancy and size of the aged population,[5–9] a growing number of elderly patients are becoming potential candidates for esophagectomy for esophageal cancer.[7,8] However, esophagectomy, being a major operative surgery, has previously shown high mortality and poor long-term survival in elderly patients.[10–12] Despite advanced surgical technologies and perioperative care techniques, the adequacy of esophagectomy in elderly patients with esophageal cancer remains controversial.[5,10] Data on the effects of surgery and the survival outcome following esophagectomy in elderly patients remain scant.[5,8,9] The short-term surgical risk and potential loss in quality of life must be analyzed against the long-term benefit of the surgery.

No standard cutoff age for identifying patients as elderly in relation to esophagectomy has been defined. Along with a gradual decline in physiological function and functional reserve, aging slows the process of recovery from major stress conditions such as surgery.[13] A study reported that an age >70 years was associated with a significantly increased risk from surgery for esophageal cancer.[14] The stress-buffering properties of physiological support following esophagectomy were more evident in patients aged ≥70 years than in those aged <70 years. Thus, the age of 70 years was considered a critical cutoff point for identifying patients who received esophagectomy as elderly. In the current study, we retrospectively enrolled patients with esophageal cancer and compared their surgical and long-term survival outcomes by assigning them to two groups.

2. Methods

Patients who received curative esophagectomy for esophageal cancer between January 2001 and December 2012 were enrolled and assigned to two groups according to their age at diagnosis: Group 1 comprised patients aged ≥70 years and Group 2 comprised patients aged <70 years. Esophagectomy and reconstruction of the esophagus were conducted using the Orringer transhiatal technique for lower esophageal tumors and the two-stage Ivor–Lewis or three-stage McKeown procedure for tumors of the mid and upper third of the esophagus. Clinical data of the patients were retrospectively collected and analyzed. The definitions of tumors, metastatic descriptors, and staging classification used in the current study were based on the definitions described in the seventh edition of the American Joint Committee on Cancer staging manual.[15] Thus, the stages of patients who were treated before 2009 were revised according to the new staging system. Because a standard definition of celiac and cervical lymph nodes related to lower thoracic and upper thoracic esophageal cancer is not described in the manual, the stage of these cases in both groups was considered as the M1 stage.

Preoperative evaluation included a detailed risk assessment based on the history of cardiopulmonary, cerebrovascular, hepatic, and renal diseases. All patients were subjected to endoscopy, barium esophagography, abdominal sonography, computed tomography, cell and biochemistry profiling, electrocardiography, pulmonary functional tests, and arterial blood-gas analysis before surgery. Patients with a clinical stage ≤ Stage III and having a performance status ≤ 2 were evaluated by a multidisciplinary team and were considered surgical candidates. Following esophagectomy of locally advanced or recurrent esophageal cancer, eligible patients received concurrent or sequential chemotherapy and/or radiotherapy, according to their performance and tumor status. The adjuvant chemotherapy involved first-line treatment using a cisplatin-based doublet combination with fluorouracil and advanced-line treatments (for 13 patients) with cetuximab (for six patients), taxanes (for four patients), doxorubicin (for two patients), and bevacizumab (for one patient).

Patients were regularly followed up for 1–2 months and systemically examined every 3 months for the first 2 years, and 6 months thereafter. The postoperative analysis included chest roentgenography, computed tomography, abdominal sonography, measurement of serum levels of carcinoembryonal antigen (for adenocarcinoma) and squamous cell carcinoma (for squamous cell carcinoma), and a Tc-m99 whole body bone scan, and brain scan or whole body positron emission tomography. Patients were immediately examined if symptoms and signs specific to the progression of a suspicious disease were observed. Tumor progression or recurrence was defined using biopsy or at least two positive clinical examinations.

Several variables, namely sex, nutritional status, performance status, pulmonary function (functional vital capacity and first-second forced expiratory volume), tumor location (upper third, middle third, and lower third), tumor size, tumor grade (I, II, III, IV), histology, and chemoradiotherapy, were compared between the two groups to determine the major effects of age on the surgical and survival outcomes. The surgical outcomes were compared using six variables, namely blood loss during surgery, completeness of resection (R0: resection with negative