

## The effectiveness of transthoracic surgical treatment in elderly patients with esophageal cancer

*İleri yaş özofagus kanserli olgularda transtorasik cerrahi tedavinin etkinliği*

Yener Aydın,<sup>1</sup> Atilla Eroğlu,<sup>1</sup> Atıla Türkyılmaz,<sup>1</sup> Betül Gündoğdu<sup>2</sup>

Department of Thoracic Surgery, Medical Faculty of Atatürk University, Erzurum, Turkey;

Department of Pathology, Medical Faculty of Atatürk University, Erzurum, Turkey

**Background:** The aim of this study was to assess the results of surgical treatment and survival in elderly patients with esophageal carcinoma.

**Methods:** Between January 1998 and June 2010, 37 consecutive elderly patients (24 females, 13 males, mean age 74±3.7 years; range 70 to 83 years) underwent Ivor Lewis-type esophagectomy. Patients who underwent esophagectomy for palliative reasons, those who were treated with neoadjuvant chemotherapy, those who underwent another surgical procedure together with Ivor Lewis esophagectomy, and those whose reconstruction was performed with any tissue other than that of the stomach were excluded.

**Results:** According to American Joint Committee on Cancer (AJCC) staging, four (10.8%), 13 (35.2%), six (16.2%) and 14 (37.8%) were found to have stage I, IIA, IIB and III respectively. Perioperative, early and late postoperative complications occurred in 16 patients (43.2%). The hospital mortality rate (30-days) was 8.1% (n=3). The primary causes of mortality were anastomotic leak and respiratory failure. The mean hospital stay after the operation was 14.5 days. The median survival was 28.7 months. The one-year, three-year, and five-year survival rates of the patients were 70.3%, 31.0%, and 21.4%, respectively.

**Conclusion:** The results of the study suggest that transthoracic surgical management may be performed in selected elderly patients with esophageal cancer.

**Key words:** Elderly; esophagus cancer; transthoracic esophagectomy.

**Amaç:** Bu çalışmada ileri yaş özofagus kanserli olgularda cerrahi tedavi ve sağkalım sonuçları değerlendirildi.

**Çalışma planı:** Ocak 1998 ve Haziran 2010 tarihleri arasında ardışık 37 ileri yaşlı hastaya (24 kadın, 13 erkek, ort. yaş 74±3.7 yıl; dağılım 70-83 yıl) Ivor Lewis tipi özofajektomi uygulandı. Palyatif nedenlerle özofajektomi uygulananlar, neoadjuvant kemoterapi tedavisi uygulananlar, Ivor Lewis tipi özofajektomiye ek cerrahi işlem uygulananlar ve mide dışında başka bir rekonstrüksiyon organı kullanılan hastalar çalışmaya dahil edilmedi.

**Bulgular:** Amerikan Ortak Kanser Komitesi (AJCC) evreleme sistemine göre, hastaların dördünün (%10.8); 13'ünün (%35.2); altısının (%16.2) ve 14'ünün sırası ile evre I, evre IIA, evre IIB ve evre III olduğu bulundu. On altı hastada (%43.2) ameliyat sırası, erken ve geç dönem ameliyat sonrası komplikasyonlar görüldü. Hastane mortalitesi (30 gün) %8.1 (n=3) idi. Mortalitenin primer nedenleri anastomoz kaçağı ve solunum yetmezliği idi. Ameliyat sonrası ortalama hastane yatış süresi, 14.5 gün idi. Medyan sağkalım 28.7 ay idi. Bir yıl, üç yıl ve beş yıllık sağkalım oranları sırası ile %70.3, %31.0 ve %21.4 idi.

**Sonuç:** Bu çalışmanın sonuçları, ileri yaş özofagus kanserli seçilmiş olgularda transtorasik cerrahi tedavinin uygulanabileceğini göstermektedir.

**Anahtar sözcükler:** İleri yaş; özofagus kanseri; transtorasik özofajektomi.



Available online at  
www.tgkdc.dergisi.org  
doi: 10.5606/tgkdc.dergisi.2012.162  
QR (Quick Response) Code

Received: September 6, 2011 Accepted: December 28, 2011

Correspondence: Yener Aydın, M.D. Atatürk Üniversitesi Tıp Fakültesi Göğüs Cerrahisi Anabilim Dalı, 25240 Erzurum, Turkey.

Tel: +90 442 - 316 63 33 e-mail: dryeneraydin@hotmail.com

Esophageal cancer accounts for 5-7% of all cancers of the gastrointestinal system. Currently, the only potentially curative treatment is surgical removal of the tumor. However, most patients are ineligible for surgery at diagnosis due to lymph node or distant organ metastasis.<sup>[1]</sup> This type of cancer is one of the most rapidly progressive and difficult diseases to treat, and despite aggressive treatment, the detailed five-year survival rate is only as high as 30%.<sup>[2]</sup> Furthermore, significant morbidity and mortality have been observed following esophagectomies, with the reported complication and hospital mortality rates as high as 50% and 5-10%, respectively.<sup>[3]</sup>

Larger studies have reported the average age at esophageal cancer diagnosis to be 50-60 years old. However, this type of cancer has also been detected among younger age groups. The aims of our study were to analyze the morbidity and mortality rates while also analyzing the results of our surgical treatment performed on elderly esophageal cancer cases and then compare our results with the literature.

## PATIENTS AND METHODS

Between January 1998 and June 2010, 37 consecutive patients of advanced age (24 females, 13 males, mean age  $74 \pm 3.7$  years; range 70 to 83 years) underwent an Ivor Lewis esophagectomy in the Department of Thoracic Surgery, and these patients were studied retrospectively from the hospital records. Exclusion criteria included those who had undergone esophagectomies for palliative reasons, those who had been treated with neoadjuvant chemotherapy, those who had undergone another surgical procedure together with the Ivor Lewis esophagectomy, and those whose reconstructions were done with any tissue other than that from the stomach.

Concomitant diseases were present in 15 patients (40.5%). Hypertension was noted in 10 patients (27.0%) and diabetes mellitus (DM) in four (10.8%). Two patients had either chronic obstructive pulmonary disease (COPD), hyperthyroidism, heart failure, or peptic ulcer disease (5.4% for each). In addition, one patient had deep venous thrombosis (DVT), and another had skin cancer (2.7% for each). Moreover, 11 patients were smokers, and one had a history of alcohol abuse.

All patients who were scheduled for total surgical resection were preoperatively evaluated by a cardiologist and pulmonologist regardless of whether the patients had persistent disease in their history. Furthermore, all patients underwent a pulmonary function test. Seventeen (46%) had normal values ( $FEV_1 > 80\%$ ) 15 (40.5%) had mild values ( $FEV_1$ : 50-80%), and five (13.5%) had moderate respiratory failure ( $FEV_1$ : 30-50%). The

preoperative mean  $FEV_1$  level was detected as  $1.87 \pm 0.58$  lt (range, 0.98 lt to 3.14 lt).

An epidural catheter was inserted in all cases, and a median laparotomy was performed. The stomach was mobilized, and the abdomen was closed after dilatation of the esophageal hiatus. The surgeon entered the thoracic cage through a right thoracotomy at the fifth intercostal space, and the esophagus was dissected. Proximal and distal tumor negative margins of 7 to 8 cm in length were excised, and reconstruction was carried out via stapling. A two-field lymph node dissection was also performed on all patients. The operation was complete following the placement of a nasogastric tube and two thoracic tubes.

Patient information were extracted from the hospital records, notes from outpatient clinic visits, and reports related to the endoscopy, operation, and pathology examination. The patients were classified according to age, gender, concomitant diseases, endoscopic tumor localization, pathologic type of tumor, tumor stage, hospital stay, rates of morbidity and mortality, and survey results. Our patients' results were then compared with those in the literature.

## Statistical analysis

Statistical analysis of the data was performed using the SPSS for Windows (SPSS Inc., Chicago, Illinois, USA) version 11.0 software program, and the results were expressed as mean  $\pm$  standard deviation. Continuous variables were compared using the Mann-Whitney U test. Survival estimates were calculated by the Kaplan-Meier method, and survival comparisons were performed using the log-rank test. In addition, Cox proportional hazard models were used to identify independent predictors of complication, mortality, and survival, and  $p < 0.05$  was considered to be significant.

## RESULTS

Dysphagia was present in 35 (94.6%) of the patients while 16 (43.2%) had a history of weight loss. Other symptoms were retrosternal and epigastric pain, chest pain, weakness, anorexia, regurgitation, cough, hematemesis, nausea/vomiting, and odynophagia.

In our study, the rate of cases with tumor localization at the cardia and lower end of the esophagus was 48.6% ( $n=18$ ). There were 17 patients (46.0%) with mid-end esophageal tumors and two (5.4%) with upper-end esophageal tumors.

The histopathologic classification of our cases was as follows: squamous cell carcinoma in 27 patients (73.0%), adenocarcinoma in six patients (16.2%), adenosquamous

carcinoma in three patients (8.1%), and sarcomatoid cancer in one patient. The adenocarcinomas were of the primary esophageal type, but the tumor was not located at the extension of the tunica muscularis in the cardial portion of the esophagus.

According to the American Joint Committee on Cancer (AJCC) staging, four patients (10.8%) were at stage I, 13 (35.2%) were at stage IIA, six (16.2%) were at stage IIB, and 14 (37.8%) were at stage III.

Perioperative, early, and late postoperative complications occurred in a total of 16 patients (43.2%) (Table 1), and 10 underwent postoperative chemoradiotherapy.

The 30-day hospital mortality rate was 8.1% (n=3), with the primary causes being anastomotic leak (n=2) and respiratory failure (n=1). The median survival was 28.7 months, and the tumor-free survival was 27.2 months. The one-, three-, and five-year survival rates of the patients were 70.3%, 31.0%, and 21.4%, respectively (Figure 1).

Furthermore, the mean hospital stay after the operation was 14.5 days (range, 8 to 81 days).

Gender, comorbid diseases, histological type, stage, and tumor location were not identified as independent prognostic factors for predicting complications and mortality (p>0.05).

**DISCUSSION**

Surgical resection of esophageal cancer is controversial in patients over 70 years of age for several reasons. Many surgeons are concerned about older patients who underwent surgical resection due to the high

mortality and morbidity rates. Several authors believe that elderly patients are diagnosed in advanced stages due to late-onset symptoms and a longer time interval between onset and diagnosis.<sup>[4,5]</sup> It has been stated that the life expectancy of elderly esophageal cancer patients is lower than that of young patients.<sup>[4,5]</sup> Due to the aforementioned reasons, many surgeons prefer palliative management of elderly patients rather than aggressive surgical excision.<sup>[4]</sup>

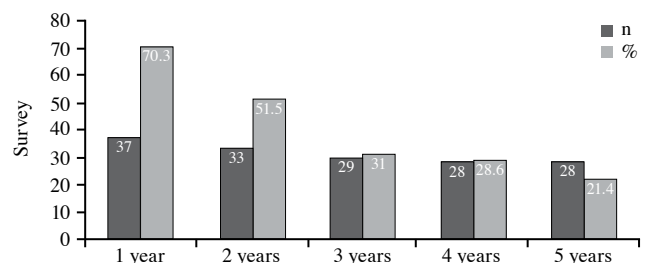
Preoperative risk evaluation and estimation of prognostic risk factors for older patients is another controversial topic. Some studies<sup>[5,6]</sup> have detected a strong relationship between advanced age during and/or after an esophageal resection and a bad prognosis. In older patients, complications are seen more frequently, especially those which involved the cardiac and pulmonary systems. In addition, there is no personal risk classification system for older patients, so there is a necessity for a scoring system to identify the cardiac and pulmonary risks for older patients. Such a system might enable preoperative cardiac and/or pulmonary supportive manipulations; thus, the risk of complications could be reduced.<sup>[5]</sup>

Takahashi et al.<sup>[7]</sup> detected that pulmonary complications are important risk factor in the postoperative 50-day mortality rate of elderly esophageal cancer patients, and they detected no other risk factor of importance related to survival of patients. The stage of cancer and age of the patient were detected as independent predictors for long-term survival after surgery. In order to improve the survival of elderly esophageal cancer patients, they scrutinized two points: postoperative critical care in order to prevent pulmonary complications and the time of the surgery in order to ensure it was performed at the earliest possible stage of the cancer.

Respiratory complications, such as pneumonia, are commonly reported in elderly esophageal cancer patients;<sup>[8,9]</sup> therefore, intraoperative protection of the right bronchial artery and right pulmonary branches of the vagal nerve and chest physiotherapy in order

**Table 1. Perioperative, early, and late-stage postoperative complications**

Perioperative complications	Patients	
	n	%
Bronchial rupture (secondary to Carlen’s tube)	1	2.7
<i>Early postoperative complications</i>		
Anastomotic leak	3	8.1
Empyema	3	8.1
Cardiac complications	3	8.1
Contralateral hydrothorax	3	8.1
Respiratory distress	1	2.7
Incisional hernia	1	2.7
Wound infection	1	2.7
<i>Late postoperative complications</i>		
Recurrence-distant metastasis	6	16.2
Anastomotic stricture	3	8.1



**Figure 1.** Survival rates for patients at specific postoperative periods.

to excrete pulmonary secretions are crucial. We implemented an epidural catheter to all of our patients to prevent postoperative pulmonary complications. Furthermore, we provided the most powerful analgesia so as to excrete pulmonary secretions. We believe that the lower complication rate due to respiratory distress in our study was achieved because of efficient and adequate analgesia. Other possible factors that may have influenced this complication rate were a lower smoking rate among the patients and the smaller number of patients with preoperative chronic obstructive pulmonary disease (COPD). Cardiology and pulmonology specialists preoperatively examine each patient in our clinic, whether or not they have cardiac or pulmonary disease.

Another factor that increases the number of surgical complications in elderly patients is the presence of comorbid diseases,<sup>[5,10]</sup> and this was the case for 40.5% of the subjects in our study. Of the three patients for whom mortality was observed, one had diabetes mellitus (DM), hypertension, and deep venous thrombosis, another had suffered from skin cancer, and the other patient had a history of alcohol abuse and smoking. With advanced age, organ functions begin to decrease. Therefore, careful laboratory examinations of elderly patients should be undertaken. Furthermore, the probability of the presence of a second neoplastic disease in patients of advanced age is higher, as was seen in our case. In such situations, the postoperative complication risk is further increased due to the additional suppression of the immune system.

Several studies have pointed out that the survival rate after surgery was higher than that of patients with non-surgical management.<sup>[4,11]</sup> Other studies have declared that surgical treatment in elderly patients yields beneficial results that are comparable to those of younger patients.<sup>[10,12-14]</sup> Contemporary studies have also reported no difference between the surgical risks in elderly and younger patients. Moreover, developments in anesthesia, surgical techniques, surgical equipment, and postoperative care in recent years have yielded improvement in the survival rates of older patients.<sup>[15]</sup>

Pultrum et al.<sup>[5]</sup> reported the overall complication rate and hospital mortality rate of patients over 70 years old as 69% and 11%, respectively. Furthermore, the postoperative recurrence rate was 42% for elderly patients, which was statistically significantly lower than that of younger patients. In our study, the presence of comorbidity was identified as an independent risk factor.

There is a conflict in the literature regarding the proper surgical management technique for elderly

patients. Some authors<sup>[11]</sup> have suggested limited surgical resection in older patients due to postoperative complications and the presence of comorbid diseases. However, there have also been reports that emphasized that two regional lymph node dissections in conjunction with a transthoracic esophagectomy did not increase mortality and did not decrease long-term overall survival rates in elderly patients. Sabel et al.<sup>[4]</sup> reported in their study that they did not detect any increase of blood loss, hospitalization, anastomosis leakage, or postoperative stricture in the advanced age group compared with the younger age group. Moreover, they did not detect any differences regarding pulmonary complications in patients who underwent the Ivor Lewis technique and those who did not. In addition, the rate of cardiac complications in elderly patients was more common. Recent studies have reported a five-year survival rate for elderly patients after esophageal resection of between 18 and 27%.<sup>[4,9,16]</sup> In our study, all of the patients were managed via transthoracic esophagectomies. The overall complication rate, hospital mortality rate, and five-year survival rate for our patients were 43.2%, 8.1%, and 21.4%, respectively. These results are similar to those of recent studies.

In conclusion, preoperative evaluation of elderly patients should be done more carefully, and the decision with regard to surgical or non-surgical management should be made after judging the pros and cons of both techniques. Our study is consistent with some previous studies in that it emphasized that transthoracic esophageal resections can be performed safely to select patients who are 70 years old or older.

#### **Declaration of conflicting interests**

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

#### **Funding**

The authors received no financial support for the research and/or authorship of this article.

#### **REFERENCES**

1. Turkyilmaz A, Eroglu A, Aydin Y, Karaoglanoglu N. The relationship of serum CEA and CA 19-9 levels to liver metastasis and pancreatic invasion in esophageal cancer. *Turk J Med Sci* 2009;39:895-9.
2. Turkyilmaz A, Eroglu A, Aydin Y, Yilmaz O, Karaoglanoglu N. Survival in esophageal cancer patients with hematogenous distant organ metastases. *Turk J Med Sci* 2009;39:415-21.
3. Aydin Y, Turkyilmaz A, Eroglu A, Alici HA, Karaoglanoglu N. The use of pedicled omentum flap in the prevention of esophagogastric anastomotic leak in esophageal cancer. *Turk Gogus Kalp Dama* 2010;18:300-4.
4. Sabel MS, Smith JL, Nava HR, Mollen K, Douglass HO,

- Gibbs JF. Esophageal resection for carcinoma in patients older than 70 years. *Ann Surg Oncol* 2002;9:210-4.
5. Pultrum BB, Bosch DJ, Nijsten MW, Rodgers MG, Groen H, Slaets JP, et al. Extended esophagectomy in elderly patients with esophageal cancer: minor effect of age alone in determining the postoperative course and survival. *Ann Surg Oncol* 2010;17:1572-80.
  6. Kinugasa S, Tachibana M, Yoshimura H, Dhar DK, Shibakita M, Ohno S, et al. Esophageal resection in elderly esophageal carcinoma patients: improvement in postoperative complications. *Ann Thorac Surg* 2001;71:414-8.
  7. Takahashi T, Hashimoto H, Noro T, Hino Y, Hirashima T, Kuroiwa K, et al. Risk factors of operative death and prognosis following operations for esophageal cancer in the elderly. *Nihon Ronen Igakkai Zasshi* 1995;32:781-5. [Abstract]
  8. Yonekawa H, Shima S, Yoshizumi Y, Bessho T, Tanaka S. Treatment of patients with esophageal carcinoma 80 years old and above (in Japanese with English abstract). *Nippon Shokakigeka Gakkai Zasshi (Jpn J Gastroenterol Surg)* 1994;27:1892-8.
  9. Chino O, Makuuchi H, Machimura T, Mizutani K, Shimada H, Kanno K, et al. Treatment of esophageal cancer in patients over 80 years old. *Surg Today* 1997;27:9-16.
  10. Liu HC, Chen YC, Chen CH, Chen YJ. Esophagectomy in elderly patients with esophageal cancer. *International Journal of Gerontology* 2010;4:176-9.
  11. Enzinger PC, Mayer RJ. Esophageal cancer. *N Engl J Med* 2003;349:2241-52.
  12. Abrams JA, Buono DL, Strauss J, McBride RB, Hershman DL, Neugut AI. Esophagectomy compared with chemoradiation for early stage esophageal cancer in the elderly. *Cancer* 2009;115:4924-33.
  13. Morita M, Egashira A, Yoshida R, Ikeda K, Ohgaki K, Shibahara K, et al. Esophagectomy in patients 80 years of age and older with carcinoma of the thoracic esophagus. *J Gastroenterol* 2008;43:345-51.
  14. Braiteh F, Correa AM, Hofstetter WL, Rice DC, Vaporciyan AA, Walsh GL, et al. Association of age and survival in patients with gastroesophageal cancer undergoing surgery with or without preoperative therapy. *Cancer* 2009;115:4450-8.
  15. Poon RT, Law SY, Chu KM, Branicki FJ, Wong J. Esophagectomy for carcinoma of the esophagus in the elderly: results of current surgical management. *Ann Surg* 1998;227:357-64.
  16. Cijis TM, Verhoef C, Steyerberg EW, Koppert LB, Tran TC, Wijnhoven BP, et al. Outcome of esophagectomy for cancer in elderly patients. *Ann Thorac Surg* 2010;90:900-7.