

Evaluation of Predicting Factors on Patients' Outcome Underwent Esophageal Cancer Surgery Treatment, A Single Institution, A Decade of Study, Firoozgar Hospital, Tehran, Iran 2008-2019

Kashanizadeh A¹, Baghaiw M^{2*}, Ghasemi SA², Ghandali M² and Tajiknia V^{2*}

¹General surgeon, Surgery department, Firoozgar hospital, University of Medical Sciences, Tehran, Iran

²Department of Surgery, Iran University of Medical Sciences, Tehran, Iran

*Corresponding author:

Vida Tajiknia and Masoud Baghaiw
Department of Surgery, Iran University of Medical Sciences, Firoozgar hospital, Tehran, Iran,
Tel: +989126852043, E-mail: tajiknia@gmail.com;
atefeka@gmail.com

Received: 03 Sep 2021

Accepted: 22 Sep 2021

Published: 27 Sep 2021

Copyright:

©2021 Tajiknia and Baghaiw M, This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and build upon your work non-commercially.

Citation:

Tajiknia V and Baghaiw M, Evaluation of Predicting Factors on Patients' Outcome Underwent Esophageal Cancer Surgery Treatment, A Single Institution, A Decade of Study, Firoozgar Hospital, Tehran, Iran 2008-2019. Japanese J Gastro Hepato. 2021; V7(3): 1-9

Keywords:

Esophageal cancer; Esophageal adenocarcinoma;
Esophageal squamous cell carcinoma; Patient survival rate; Predictive factors

1. Abstract

1.1. Background and Objectives: Esophageal cancer is one of the deadliest cancers, because in addition to its high prevalence, mortality rate is also high and puts it at the sixth place in terms of mortality. The most commonly used treatment in these patients is surgery. People with tumors in higher stages may also undergo chemotherapy. This study was conducted to evaluate the predictive factors for the outcomes of surgical patients.

1.2. Method and Materials: In this study, we included 143 patients with two types of esophageal cancer who underwent esophageal resection surgery in Firoozgar Hospital between April 2008 – April 2019. Demographic information was extracted from their medical records and they were contacted for further information and evaluation. The variables considered in this study included gender, age, type of neoplasm, tumor stage, lymph node metastases, etc. The information was analyzed using SPSS version 25. This study was approved by ethical committee in this center.

1.3. Results: In this study, 76 people were male and others were female. 110 patients had squamous cell carcinoma and 33 cases had adenocarcinoma. The survival rate was 22% in men and 19% in women. The most prominent factors of prognosis include tumor stasis, tumor location, lymph node involvement, and positive family history. The most common complication after surgery were heart complications and anastomosis leakage.

1.4. Conclusion: The most powerful prognostic factors were tumor

stage, tumor location, lymph node involvement, and positive family history.

2. Introduction

Esophageal cancer is among the 10 most common cancers in the world and is the sixth leading cause of cancer death, including squamous cell carcinoma of the esophagus and esophageal adenocarcinoma, the rate of adenocarcinoma cancer is increasing compared to the past [1]. Nowadays, Esophageal cancer is increasingly being diagnosed in young people [2].

The last two decades have seen changes in the prevalence, histological type, and treatment algorithm of esophageal cancer. However, the prognosis of esophageal cancer remains poor [3]. Survival-based studies show that the adequacy of esophageal surgery is low in developing countries [4].

Information on functional outcome and quality of life after esophageal surgery is also limited. Annoying symptoms have been observed alternately in short-term and long-term follow-up after surgery in EC patients [5]. On the other hand, surgery is the only option for treating EC patients. In recent decades, a commonly accepted surgical approach has not been clearly stated, but the number of patients who have improved after esophagectomy is increasing due to recent advances in surgical techniques [6]. Chemotherapy is a therapeutic modality. It is acceptable and effective for EC, but its recurrence rate is high and in many patient's remission does not begin with chemoradiation alone [7]. Although surgical resection is the most effective

treatment for patients with isolated esophageal cancer. The 5-year survival rate is still very low despite recent advances in early diagnosis and the extent of lymphadenectomy [8].

Medium- and long-term survival is low in esophageal cancer, which is attributed to the characteristics of the tumor. The current treatment for esophageal cancer involves any combination of surgery, chemotherapy and radiotherapy [9]. In order to improve the treatment strategy in esophageal squamous cell carcinoma (ESCC), the combination of neoadjuvant chemotherapy followed by surgical resection is performed in patients with stage II / III [10].

The heterogeneities that exist in the outcomes of different EC cases, especially the type of adenocarcinoma, can be explained by examining the tumor bed tissue, tumor grade, and gastroesophageal junction (GEJ) involvement [11].

Factors affecting survival can be divided into two categories: tumor-related and factors unrelated to tumor characteristics [12]. The three most common techniques for thoracic esophagectomy are transhiatal approach, Iver Lewis technique, and McKeown technique. When the tumor is more advanced, chemotherapy neoadjuvant or chemoradiotherapy neoadjuvant is added [13].

Radiotherapy is the first treatment option for EC patients. The surgical anastomosis site is prone to many complications such as leakage, fistula, stenosis and bleeding. Anastomotic leak is one of the main causes of mortality and morbidity after surgery [14].

One of the factors affecting the patient's outcome is the surgical technique, as there is a dispute about the adequacy of trans thoracic approach compared to transhiatal approach [15].

It seems that the element that affects mortality and premature morbidity after surgery is the method of approach. Careful selection of patients for EC treatment and avoidance of early complications is crucial. Early recurrence and death after esophagectomy underscores the importance of recognizing the factors associated with poor outcomes [16].

Although studies have shown the effect of positive lymph nodes relative to total resected lymph nodes, the prognostic effect of negative lymph nodes is very low [17].

Squamous cell carcinoma of the esophagus (ESCC) is a major health problem in developing countries, including Iran. [18] ESCC has a poor prognosis due to its late detection. Little information is available on EC prognosis in Iran. Five-year survival is significantly lower in patients with surgical treatment of esophageal cancer. Cardiopulmonary problems in Iran have been the strongest prognostic factor of first month mortality. [19] There are many geographical and temporal differences between the incidence of EC even in small areas, which indicates the important effect of environmental factors [20].

Northern Iran, Golestan province is a region with a high incidence of esophageal squamous cell carcinoma. Significant results have been obtained in studies conducted in this area and the average survival

rate of 7 months has been reported, which has been reported to be related to tobacco use, Turkmen race and prognosis of patients [21].

In Iran, esophageal cancer is usually diagnosed in the final stages, when the chances of survival and salvation of the patient are very small [22].

3. Background

In a 2010 Netherland study of prognostic factors in the survival of esophageal SCC after surgery, tumor size, degree of differentiation, lymphadenopathy, stage of the disease, family history of esophageal cancer as prognostic factors after Esophagectomy surgery is known and family history has been introduced as an important prognostic factor that surgeons should consider when choosing a treatment method [8].

In a 2012 study in China of 109 patients with primary esophageal SCC cancer for surgical treatment and prognosis analysis, SCC was identified as a systemic invasive disease with a low prognosis of surgery or curative therapy alone. Multi-modality treatment based on radical esophagectomy has been reported for patients with 1 stage and 2 diseases [23].

In a 2012 study in Prague to assess the effect of nutritional factors on overall survival and progression of esophageal cancer in patients treated with neo-adjuvant therapy and surgery, serum albumin levels as an important prognostic factor in The mentioned group was introduced. Adequate nutritional support in these patients provides the possibility of completing therapeutic doses of chemoradiotherapy and radical resection of the disease [24].

In a study conducted in 2015 in Iran by Dr. Tabatabai et al. In Isfahan in a prospective method on 53 patients with a mean age of 2.55 to compare transhiatal technique and esophagectomy without mediastinal manipulation for tumors of the lower third of the esophagus and Cardia was performed as a new technique by conventional methods. Fifty patients underwent surgery with the new technique. All patients were followed for 4 to 40 months. The mean surgery time was 120 minutes and the volume of blood lost was 130 ml. The mean hospital stay in ICU was 1 day and sometimes 7 days. The most common complication in the new method was mediastinal pleura injury (20% (followed by anastomotic leak), 16% (and narrowing of the anastomosis) (10%). This new technique is effective and safe for tumors of the heart and lower third of the esophagus by reducing bleeding, reducing the trauma of the procedure, and reducing cardiopulmonary complications and reducing hospital mortality [25].

In a recent study in Canada in 2018 by Dr. Ahmadi and colleagues on 210 patients with esophageal cancer who underwent surgery using two techniques: open esophagectomy and minimally invasive esophagectomy (Iver Lewis) showed that 47% of patients were treated with OE and 25% with MIE. The results of the surgery indicated that people treated with MIE compared with OE had a blood count. had less loss.) 312 ml in MIE and 657 ml in.) P value <0.01. OE Also,

people treated with the Iver Lewis technique spent less time in the hospital than other people. 10 days in MIE compared to 8-14 days in 30 (.) P value <0. 01.OE [26].

Due to the higher prevalence of EC in the Middle East, including Iran and its different pattern compared to Western societies, we decided to predict the factors of patient outcomes, risk factors for complications and the adequacy of surgery using short-term and long-term morbidities. Examine patient survival and recurrence rates in various treatment modalities in EC patients and identify the factor or factors that have the greatest impact on treatment efficacy and outcome improvement.

4. Material and Methods

In this cross-sectional-analytical study, the files of 143 patients who were treated for esophageal cancer at Firoozgar Hospital in Tehran from 1986 to 1996 were collected. All patients who were diagnosed with esophageal cancer during this period and underwent surgery were included in this study. Their basic information was extracted from their file. In order to evaluate the survival of patients, the date of diagnosis of the disease as the source and calculation of survival will be from the beginning of treatment. In cases where the patient was discharged from the hospital, the patient's family was contacted and the necessary information about the patient's current condition was obtained.

4.1. Type of Research

Retrospective and monocentric cross-sectional analytical study

4.2. Society and Sample Research

All patients with esophageal cancer who underwent consecutive surgery at this center at a specified time.

4.3. Data Collection Tools

Patients' information is collected in the form of file reading and based on the data in each patient's file, pathology reports, imaging reports, operation description and patient file summary.

4.4. Research Variables

In this study, various variables such as neoplasm type, lesion location, tumor stage, tumor grade, serum albumin, lymph node involvement, presence of lymphadenopathy, vascular involvement by tumor, smoking, pleural effusion and ascites, dysphagia, weight loss more than% 10 in the last 6 months, reflux, dyspnea, hoarseness, cough, regurgitation, hemoptysis, nausea or vomiting, alcohol consumption, surgical technique, anastomotic complications, mortality rate of the first 30 days, postoperative infection, need for intubation, complications Cardiac, long thoracic and recurrent laryngeal nerve damage, severe and major bleeding more than 2 liters, embolism, DVT, receiving neoadjuvant chemotherapy, radiotherapy, contact with nitrate compounds, positive family history of esophageal cancer, hemoglobin, duration of hospital stay, duration Hospitalization and 5-year

survival of patients were considered. Data on demographic variables such as gender and age were also collected.

It should be noted that in this study, albumin was examined as a quantitative variable and then albumin levels were divided into three categories > 40, 40-35 and > 40 g / dl. The results of univariate and multivariate analyzes are based on these three categories.

In this study, people were divided into two age groups, upper and lower 60 years. Individuals' hemoglobin was quantitatively and qualitatively divided into 13 and 13% g / dl.

4.5. Data Analysis Method

After entering the data obtained from the files, the results of the study were extracted using SPSS software version 25. The results of descriptive objectives related to variables of qualitative nature were calculated and used as absolute and relative frequencies for variables with quantitative mean and standard deviation. Paired t-test or Paired t-test or Mann-Whitney test and ANOVA were used to measure the objectives for qualitative variables and for variables with quantitative nature according to the type of data distribution in terms of normality. Survival analysis and method were used. Kaplan Meyer and log rank test were used to determine the survival rate of patients and univariate and multivariate logistic regression were used to evaluate the predictive factors. 0.05 was considered for significance level.

4.6. Ethical Considerations

In order to start collecting data, the necessary permission was obtained from the management of the University of Iran Educational and Medical Center through the Vice Chancellor for Research and Technology and the Research Ethics Committee. Patients' secrets and information did not in any way penetrate outside the study. No additional costs were incurred by any of the patients during this study.

5. Results

In the present study, 143 patients with esophageal cancer, 67 of whom were male and 76 of whom were female, were evaluated for demographic characteristics and clinical history. The mean age of men was 37.58 with a standard deviation of 16.10 and the mean age of women was 28.60 with a standard deviation of 32.11. 52 men had SCC and 15 had adenocarcinoma, 58 women had SCC and 18 had esophageal adenocarcinoma. The mean time of hospitalization of women in the hospital and ICU was 0.15 days with a standard deviation of 20.6 days and 0.7 days with a standard deviation of 90.3 days. The mean hospital stay of men in the hospital and ICU was 81.13 days with a standard deviation of 89.5 days and 78.6 days with a standard deviation of 65.3 days, respectively. All patients underwent surgery after being diagnosed with esophageal cancer. 93 patients were in G1-G2 grade and 50 of them were in G3-G4 grade. For better understanding we demonstrated the results in a series of table: (Table 1-1 to table 1-12).

Table 1-1: Type of neoplasm diagnosed by sex

	MEN(percentage and numbers)	Women(percentage and numbers)
Well differentiated	% 22/37(32)	% 24/4(35)
Moderately	% 6/29(9)	% 8/39(12)
Poorly differentiated	% 7/69(11)	% 7/69(11)
Well differentiated	% 5/59(8)	% 6/99(10)
Poorly differentiated	% 4/89(7)	% 5/59(8)

Table 1-2: Histological findings of tumors and their grade by type of neoplasm

	SCC	Adenocarcinoma
G1-G2	78	15
G3-G4	32	18

Table 1-3: Tumor site

tumor location	Patient numbers
Distal 1/3 of esophagus	65
Middle 1/3 of esophagus	34
Proximal 1/3 of esophagus	23
Gastroesophageal junction	21

Table1-4: Degrees of spread of patients' tumors based on size, lymph node involvement and their metastasis

stage	SCC	Adenocarcinoma
T1	25	11
T2	28	7
T3	35	5
T4	13	11
N0	63	8
N1	27	19
N2	16	7
N3	14	8
M0	76	24
M1	65	9

Table 1-5: Lymph node involvement in patients by type of cancer

Affected lymphnode 's region	ScC	Adenocarcinoma
Upper thoracic esophagus	42%	4%
Middle thoracic esophagus		
Lower thoracic esophagus	81%	12%

Table 1-6: Lymphnodes involvement

Number of lymphnodes	Patient's percentage
None	27%
1-2	28%
3-6	22%
7-10	23%

Table 1-6: Number of lymph node involvement in three parts of the esophagus

lymphnodes	UTE	MTE	LTE
0-3	21%	17%	16%
3-7	7%	6%	9%
7-10	11%	7%	5%

Table 1-7: Clinical presentation

Symptoms	scc	Adenocarcinoma
Dysphagia	76%	84%
Significant weight loss	27%	34%
Odynophagia	48%	73%
Reflux	54%	68%
dyspnea	17%	13%
Hoarsness	14%	9%
Cough	36%	23%
Regurgitation	43%	56%
hemoptysis	12%	17%
Nausea/vomiting	22%	18%

Table 1-8: Lab findings

lab	Mean	ScC	Adenocarcinoma
hemoglobin	11/09 ± 1/39	11/13 ± 1/64	11/03 ± 0/8
albumin	3/69 ± 0/90	3/84 ± 0/48	3/22 ± 0/12

Table 1-9: SCC risk factors

Risk factor	Total	Men	Women
Cigarette smoking	23%	15%	8%
alcohol	9%	6%	3%
Family history	0.04%		

Table 1-10: Adenocarcinoma risk factors

Risk factor	Total	Men	Women
Cigarette smoking	17%	10%	7%
alcohol	13%	10%	3%
Nitrate contact	0.50%		
Family history	0.12%		

Table 1-11: Surgical technique

Surgical technique	Percentage and number
Mc keown	57.34%(82)
Iver lewis (oringer)	18.88%(27)
Trans hiatal	23.77%(34)

Table 1-12: Mortality

mortality	Percentage
total	6.3%
With comorbidity	5.5%
Without comorbidity	0.8%

5.1. Complications

The frequency of complications that occurred 30 days after surgery is as follows:

5.1.1. Anastomosis stenosis: 23 patients (08.16%) had stenosis at the site of surgical anastomosis, including 14 patients undergoing transhiatal surgery, 7 patients undergoing Mc known surgery and 4 patients undergoing iver lewis surgery.

5.1.2. Anastomosis Leakage: 15 Patients (48.10%) developed leaks at the anastomosis site, of which 10 had leakage at neck entrance site and 5 had iver lewis technique.

5.1.3. Plural Effusion: 14 patients (79.9%) developed pleural effusion after surgery, of which 7 included iver lewis and 5 trans-hiatal and 2 Mc Mknown.

15% of SCC patients and 11% of adenocarcinoma patients developed pleural effusion and 6% of SCC patients and 4% of patients with adenocarcinoma had ascites after surgery.

5.1.4. Infection: 6 patients (19.4%) developed postoperative infections, of which 4 were in the neck and 2 in the thoracic were infected in the wound. Three patients who underwent trans-thoracic surgery and one who underwent trans-hiatal surgery developed pneumonia.

5.1.5. Cardiac Complication: 46% of patients with cardiac complications including MI 21%, heart failure 8% and 17% had cardiac arrhythmia and bradycardia. Of those who developed postoperative cardiac complications, 28% underwent postoperative chemotherapy.

5.1.6. Nerve Damage: 3% of patients with recurrent laryngeal nerve injury (McKown during transhiatal surgery) and 0.5% of patients with long thoracic nerve injury following transthoracic surgery.

5.1.7. Need for Mechanical Ventilation: 27% of total patients underwent mechanical ventilation and intubation after surgery.

5.1.8. Emboli: The incidence of embolism was 6% in those undergoing iver lewis surgery, 9% in McKown people and 3% in trans hiatal patients. It should be noted that 54% of these people also had a history of DVT.

25% of the operated patients underwent chemotherapy after surgery. 12% of them also received neoadjuvant chemoradiotherapy.

5.2. The 30-day Mortality Rate

The 30-day mortality rate of patients was 6.3% in total, which was 5 % in those with comorbidity after surgery and 1.3% in those without any comorbidity.

- During the contacts with the patients and based on the information in their files, their 5-year survival chart was drawn, which shows that the 5-year survival is 22% in men and 19% in women, and there is no significant difference between them. (P value = 0.35) (Figure A-1).
- (Figure A-2) shows the survival of patients with adenocarcinoma undergoing surgical treatment and surgery with chemotherapy. The survival of these patients in the group treated with surgery was 11.23% and in the group treated with chemotherapy was 15.03%. There was no significant difference between these two groups (p value = 0.73)
- (Figure A-3) shows the survival of patients with SCC in the two groups treated with surgery and surgery with chemotherapy. There is a significant difference in the amount of Survival among the objects treated in this group. The survival rate in these patients was 18.75% in the operated patients and 50.2% in the patients undergoing chemotherapy. (P value = 0.015)
- The relationship between three different surgical techniques and postoperative complications is as follows (Table 2-1, Table 2-2):
- There was a significant relationship between the occurrence of anastomotic stenosis and the type of surgical techniques performed. The incidence of stenosis in transhiatal surgery was higher than the other two techniques (p value:0.035:

- There was a significant relationship between leakage at the anastomosis site and the type of surgical techniques performed. Thus, the rate of leakage in the surgical group Iver Lewis was lower compared to the other two groups (p value = 0.044
- There was a significant relationship between the occurrence of pleural effusion / chylothorax with the type of surgical technique used, so that the incidence of pleural effusion in the Iver Lewis group was higher compared to the other two groups (p value = 0.015).
- There was a significant relationship between the incidence of pneumonia after surgery and the type of technique used, so that the incidence of infection was higher in people treated with Iver Lewis technique (p. Value = 0.023)
- There was a significant relationship between the occurrence of heart complications (heart attack, arrhythmia, heart failure, etc.) and people undergoing chemotherapy. Thus, people who underwent chemotherapy after surgery were more likely to suffer from heart complications. p value = 0.018

Table 2-1: Evaluation of prognostic factors in determining patients' survival: (Univariate analysis)

Prognostic factor	P value	Relative risk
age	0.064	1.7
sex	0.37	0.86
Neoplasm type	0.165	1.24
Tumor stage	0.011	1.16
Number of positive lymph nodes	0.013	2.34
Tumor site	<0.001	1.24
albumin	0.016	1.07
hemoglobin	0.025	1.45
Alcohol consumption	0.039	1.43
smoker	0.055	1.066
Weight loss	0.027	1.23
adenopathy	0.018	1.31
Family history	<0.001	1.04

Table 2-2: Evaluation of prognostic factors affecting: survival (multivariate analysis)

Prognostic factor	P value	Hazard ratio	CI(95%)
Tumor stage	0.008	1.27	1.24-1.29
Number of positive lymph node	0.011	1.15	1.09-1.021
Tumor site	<0.001	1.33	1.29-1.35
hemoglobin	0.019	1.13	1.01-1.26
albumin	0.014	1.14	1.04-1.24
smoking	0.051	1	0.98-1.03
Alcohol consumption	0.033	1.04	1.01-1.14
Weight loss	0.024	1.11	1.04-1.18
adenopathy	0.017	1.16	1.08-1.25
Family history	<0.001	1.28	1.24-1.3

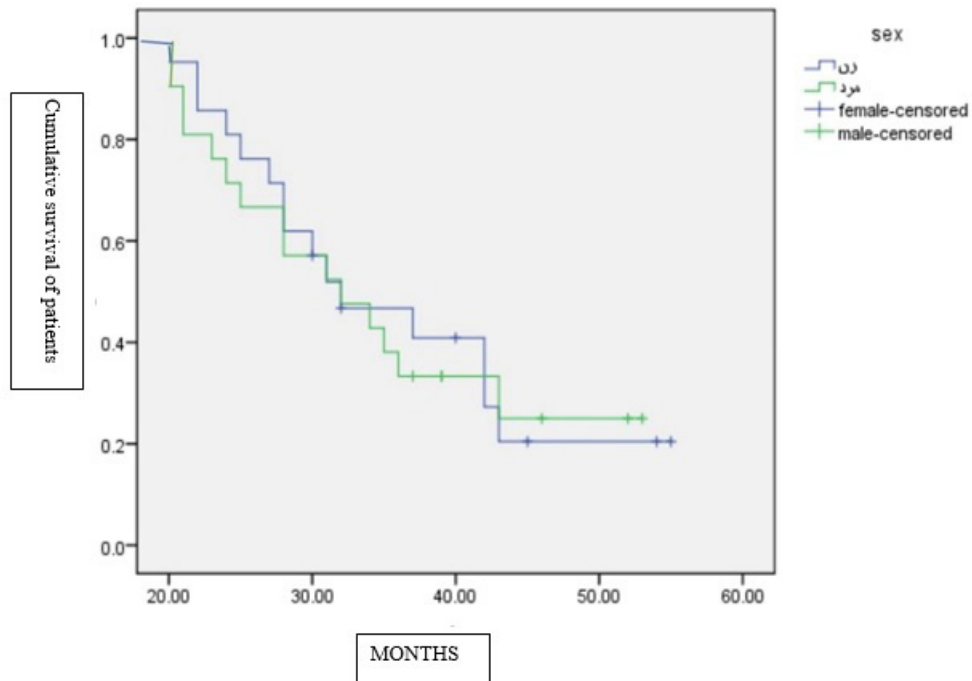


Figure A-1: 5-year survival of patients by sex

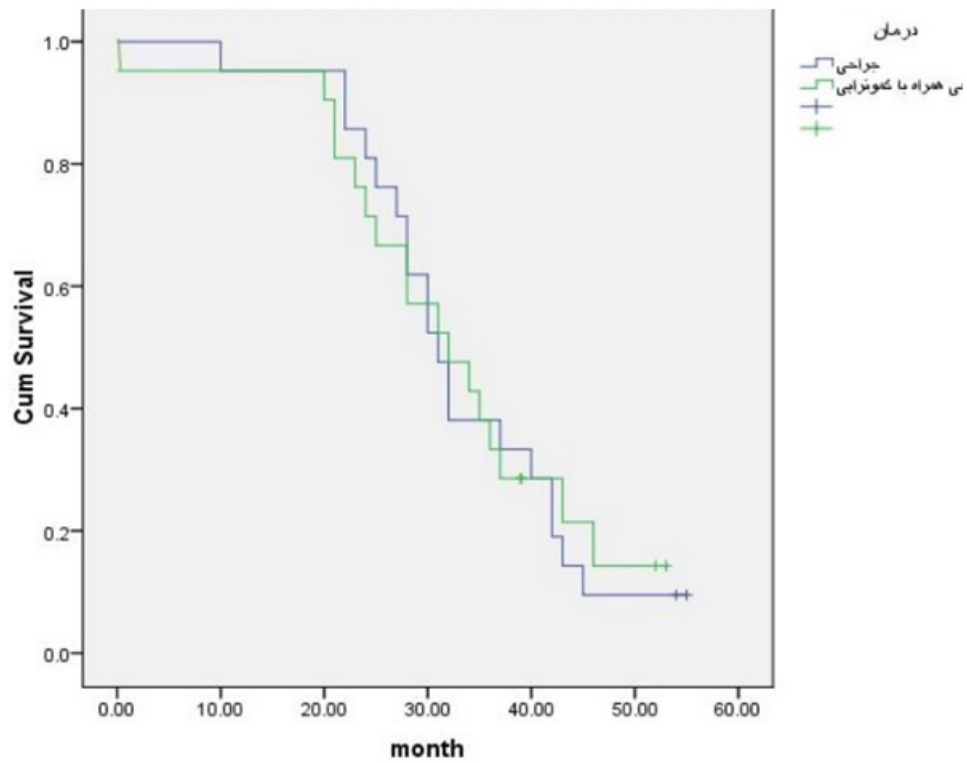


Figure A-2: The survival of patients with adenocarcinoma undergoing surgical treatment and surgery with chemotherapy

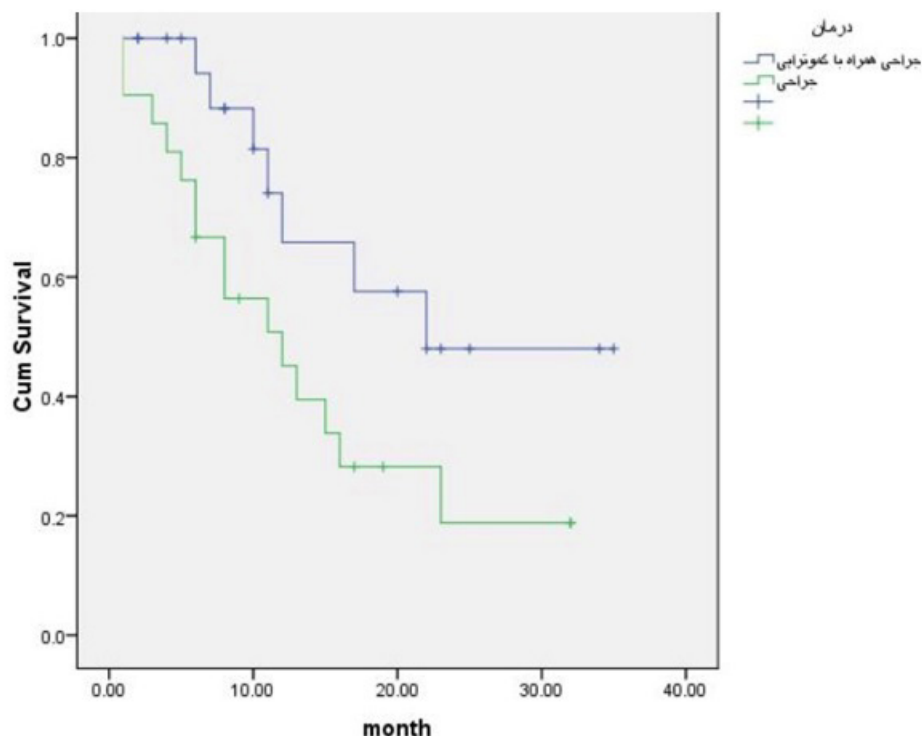


Figure A3: The survival of patients with SCC in the two groups treated with surgery and surgery with chemotherapy

6. Discussion and Conclusion

Esophageal cancer is one of the ten most common cancers in the world. The prevalence of scc cancer in the Middle East is much higher than adenocarcinoma, but today studies show that the prevalence of this type of cancer is also increasing. Therefore, this study aims to investigate the predictors of patient outcomes. Complication risk factors and the extent of surgical adequacy have been performed using short-term and long-term morbidity and survival.

In our study, the 5-year survival of all patients showed that there was no significant difference between the survival of male and female patients and sex was not considered as a prognostic factor for esophageal cancer. People with adenocarcinoma had lower survival than people with SCC and the survival rate of these people in the group treated with chemotherapy and surgery was significantly higher than the surgical group. While in people with scc there was no significant difference in survival between the two treated groups. A 2005 study by Brumiester et al., Comparing two treatments, surgery alone and postoperative chemotherapy, on 128 patients found that they achieved similar results. The overall survival rate of the patients in the two treated groups was not significantly different, but in patients with SCC, the survival rate of patients in the group treated with chemotherapy was higher than the other group. While in patients with adenocarcinoma there is no significant difference in patient survival [27].

.In this study, variables such as tumor stage, number of lymph nodes involved, tumor location, hemoglobin, albumin, smoking and alco-

hol consumption, weight loss, adenopathy and positive family history were suggested as prognostic factors in esophageal cancer.

The results of this study show that people with stage 3 and 4 tumors had a worse prognosis and higher mortality than people with stage 1 and 2. A 2014 study by Davies et al. In people with adenocarcinoma treated with neoadjuvant chemotherapy stated that tumor stage was a prognostic factor and that patients' mortality increased as it increased [28].

In this study, the number of lymph nodes involved, which were divided into three groups, was analyzed by the survival rate of patients. The results show that increasing the number of lymph nodes is a prognostic factor in patients and increases the mortality rate. A 2014 review by Woong Cho on lymph node metastases in esophageal carcinoma showed that an increase in the number of lymph nodes involved and an increase in the proportion of positive lymph nodes was an important factor in determining the prognosis of patients [29].

In this study, the initial location of the tumor in patients is considered as a strong prognostic factor. People with scc tumors in the lower extremities had a worse prognosis than the other two regions. A 2010 study by yuequan et al. In Iran on 426 patients with ESCC showed that the primary location of the tumor is a prognostic factor in these individuals and the mortality rate in those involved in the lower and upper extremities. The upper part was more than the middle(8)

In this study, hemoglobin less than 13 was considered as a prognostic factor for all patients. People with hemoglobin less than 13 had

significantly more mortality than people with hemoglobin above 13. In this study, the albumin level of individuals was divided into suffering, which the results show that there is a significant relationship between the albumin level of individuals and the mortality rate of patients. Decreased blood albumin levels are a poor prognostic factor in these patients. A 2015 study by Wu N et al. On 208 patients with SCC found the same result [30].

In this study, the relationship between smoking and alcohol consumption as risk factors as well as prognostic factors in these patients were discussed. The results of our studies show that there is a significant and linear relationship between smoking and scc cancer. P value = 0.048) ($r = 0.89$) There was no significant relationship between smoking and mortality in all patients, which seems to be due to the effect of people with adenocarcinoma, so smoking as a risk Is a factor for people with SCC. Alcohol analysis has shown that alcohol is both a prognostic factor and a risk factor in both types of cancer. In a cohort study by Huang et al. 2014 on 2151 Chinese patients showed that alcohol consumption is a prognostic factor in people with both types of cancer and if the disease is diagnosed, its consumption should be controlled [31]. Another strong prognostic factor in this study was a positive family history in people with esophageal cancer.

7. Conclusion

In this study, factors such as tumor stage, tumor location, lymph node involvement, hemoglobin, albumin, smoking and alcohol consumption, weight loss, adenopathy and positive family history were suggested as prognostic factors in esophageal cancer. Family history and site of tumor are strongest predicting factor

References

- Zhang Y. Epidemiology of esophageal cancer. *World J Gastroenterol.* 2013; 19: 5598-606.
- Van Nistelrooij AM, van Steenberg LN, Spaander MC, Tilanus HW, van Lanschot JJ, Lemmens VE et al. Treatment and outcome of young patients with esophageal cancer in the Netherlands. *J Surg Oncol.* 2014; 109: 561-6.
- Daly JM, Fry WA, Little AG, Winchester DP, McKee RF, Stewart AK et al. Esophageal cancer: results of an American College of Surgeons Patient Care Evaluation Study. *J Am Coll Surg.* 2000; 190: 562-72; discussion 72-3.
- Harirchi I, Kolahdoozan S, Hajizadeh S, Safari F, Sedighi Z, Nahvijou A et al. Esophageal cancer in Iran; a population-based study regarding adequacy of cancer surgery and overall survival. *Eur J Surg Oncol.* 2014; 40: 352-7.
- Aghajanzadeh M, Safarpour F, Koohsari MR, Ghanaei FM, Bodaghi SM, Tozandehgani H et al. Functional outcome of gastrointestinal tract and quality of life after esophageal reconstruction of esophagus cancer. *Saudi J Gastroenterol.* 2009; 15: 24-8.
- Kakuta T, Kosugi S, Kanda T, Ishikawa T, Hanyu T, Suzuki T et al. Prognostic factors and causes of death in patients cured of esophageal cancer. *Ann Surg Oncol.* 2014; 21: 1749-55. <https://jgastrohepto.org/>
- Wu AJ, Goodman KA. Clinical tools to predict outcomes in patients with esophageal cancer treated with definitive chemoradiation: are we there yet? *J Gastrointest Oncol.* 2015; 6: 53-9.
- Yuequan J, Shifeng C, Bing Z. Prognostic factors and family history for survival of esophageal squamous cell carcinoma patients after surgery. *Ann Thorac Surg.* 2010; 90: 908-13.
- Chang D, Church J. Evaluating the health-related quality of life of esophageal cancer patients. *Pract Radiat Oncol.* 2014; 4: 181-6.
- Okada N, Fujii S, Fujita T, Kanamori J, Kojima T, Hayashi R et al. The prognostic significance of the positive circumferential resection margin in pathologic T3 squamous cell carcinoma of the esophagus with or without neoadjuvant chemotherapy. *Surgery.* 2016; 159: 441-50.
- Agoston AT, Zheng Y, Bueno R, Lauwers GY, Odze RD, Srivastava A et al. Predictors of Disease Recurrence and Survival in Esophageal Adenocarcinomas with Complete Response to Neoadjuvant Therapy. *Am J Surg Pathol.* 2015; 39: 1085-92.
- Bus P, Lemmens VE, van Oijen MG, Creemers GJ, Nieuwenhuijzen GA, van Baal JW et al. Prognostic factors for medium- and long-term survival of esophageal cancer patients in the Netherlands. *J Surg Oncol.* 2014; 109: 465-71.
- Kato H, Nakajima M. Treatments for esophageal cancer: a review. *Gen Thorac Cardiovasc Surg.* 2013; 61: 330-5.
- Struecker B, Andreou A, Chopra S, Heilmann AC, Spenke J, Denecke C et al. Evaluation of Anastomotic Leak after Esophagectomy for Esophageal Cancer: Typical Time Point of Occurrence, Mode of Diagnosis, Value of Routine Radiocontrast Agent Studies and Therapeutic Options. *Dig Surg.* 2018; 35: 419-26.
- Chang AC, Ji H, Birkmeyer NJ, Orringer MB, Birkmeyer JD. Outcomes after transhiatal and transthoracic esophagectomy for cancer. *Ann Thorac Surg.* 2008; 85: 424-9.
- Davies AR, Pillai A, Sinha P, Sandhu H, Adeniran A, Mattsson F et al. Factors associated with early recurrence and death after esophagectomy for cancer. *J Surg Oncol.* 2014; 109: 459-64.
- Hsu PK, Huang CS, Wang BY, Wu YC, Chou TY, Hsu WH et al. The prognostic value of the number of negative lymph nodes in esophageal cancer patients after transthoracic resection. *Ann Thorac Surg.* 2013; 96: 995-1001.
- Roshandel G, Khoshnia M, Sotoudeh M, Merat S, Etemadi A, Nickmanesh A et al. Endoscopic screening for precancerous lesions of the esophagus in a high risk area in Northern Iran. *Arch Iran Med.* 2014; 17: 246-52.
- Mir MR, Rajabpour MV, Delarestaghi MM, Hadji M, Harirchi I, Mir P et al. Short- and long-term survival of esophageal cancer patients treated at the Cancer Institute of Iran. *Dig Surg.* 2013; 30: 331-6.
- Russo A, Franceschi S. The epidemiology of esophageal cancer. *Ann Ist Super Sanita.* 1996; 32: 65-72.
- Aghcheli K, Marjani HA, Nasrollahzadeh D, Islami F, Shakeri R, Sotoudeh M, et al. Prognostic factors for esophageal squamous cell carcinoma—a population-based study in Golestan Province, Iran, a high incidence area. *PLoS One.* 2011; 6: e22152.

22. Yarhousseini A, Sharifzadeh L, Delpisheh A, Veisani Y, Sayehmiri F, Sayehmiri K et al. Survival Rate of Esophageal Carcinoma in Iran - A Systematic Review and Meta-analysis. *Iran J Cancer Prev.* 2014; 7: 61-5.
23. Zhang BH, Yang WJ, Zhao L, He J, Wang YG, Zhang HT. [Surgical treatment and prognostic analysis of 109 patients with primary esophageal small cell carcinoma]. *Zhonghua Zhong Liu Za Zhi.* 2012; 34: 698-702.
24. Zemanova M, Novak F, Vitek P, Pazdro A, Smejkal M, Pazdrova G et al. Outcomes of patients with oesophageal cancer treated with preoperative chemoradiotherapy, followed by tumor resection: influence of nutritional factors. *J buon.* 2012; 17: 310-6.
25. Tabatabaei SA, Hashemi SM, Kelidari B. Transhiatal Esophagectomy without Mediastinal Manipulation for Lower Third Esophageal and Cardial Cancers: The First Experience of a New Technique. *Iran J Cancer Prev.* 2015; 8: 89-93.
26. Ahmadi N, Crnic A, Seely AJ, Sundaresan SR, Villeneuve PJ, Maziak DE et al. Impact of surgical approach on perioperative and long-term outcomes following esophagectomy for esophageal cancer. *Surg Endosc.* 2018; 32: 1892-900.
27. Burmeister BH, Smithers BM, GebSKI V, Fitzgerald L, Simes RJ, Devitt P et al. Surgery alone versus chemoradiotherapy followed by surgery for resectable cancer of the oesophagus: a randomised controlled phase III trial. *Lancet Oncol.* 2005; 6: 659-68.
28. Davies AR, Gossage JA, Zylstra J, Mattsson F, Lagergren J, Maisey N et al. Tumor stage after neoadjuvant chemotherapy determines survival after surgery for adenocarcinoma of the esophagus and esophago-gastric junction. *J Clin Oncol.* 2014; 32: 2983-90.
29. Cho JW, Choi SC, Jang JY, Shin SK, Choi KD, Lee JH et al. Lymph Node Metastases in Esophageal Carcinoma: An Endoscopist's View. *Clin Endosc.* 2014; 47: 523-9.
30. Wu N, Chen G, Hu H, Pang L, Chen Z. Low pretherapeutic serum albumin as a risk factor for poor outcome in esophageal squamous cell carcinomas. *Nutr Cancer.* 2015; 67: 481-5.
31. Huang Q, Luo K, Yang H, Wen J, Zhang S, Li J et al. Impact of alcohol consumption on survival in patients with esophageal carcinoma: a large cohort with long-term follow-up. *Cancer Sci.* 2014; 105: 1638-46.