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SHORT COMMUNICATION

Trans-Thoracic versus Trans-Hiatal Esophagectomy Complications and Outcomes in Patients with Esophageal Cancer in Shohada-E-Tajrish Hospital, Tehran, Iran;2000-2008

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Abstract

Background: Esophageal cancer is a poor-prognosis cancer which is common in Iran. The main treatment for this cancer is surgery which may be performed with either trans-thoracic (TTE) or trans-hiatal esophagectomy (THE). Each of these methods has some specific complications, morbidity and mortality rate, leading to controversies in method selection. Therefore, in this study we evaluated the outcomes of these two approaches in Iranian patients.

Methods: In this retrospective survey, we evaluated 100 patients with esophageal cancer who underwent either TTE or THE in Shohada-e-Tajrish Hospital, Tehran, from 2000 to 2008 and categorized them into two groups. The patients in the two groups were compared according to age, sex, tumor location and histopathologic characteristics, surgery results and complications, morbidity, mortality and death results.

Results: Sixty nine percent (69%) of patients had squamous cell carcinoma (SCC) and 59% had undergone THE. The mean age of the patients was 61.18 years. There was no difference in age, sex distribution, tumor pathology and location in the two groups. Although neck leakage of anastomoses was more frequent in THE (7.31% vs 10.16%), there was no statistically significant difference between the two groups in complications and mortality. Duration of the surgery was longer in TTE.

Conclusions: Trans-hiatal and trans-thoracic esophagectomy are the same in outcomes. Both methods can be considered as therapeutic surgical approach regarding to physician's opinion and patient's situations.

Keywords: Esophageal cancer; Trans-hiatal esophagectomy; Trans-thoracic esophagectomy; Morbidity; Mortality

Introduction

Esophageal cancer is the 8th common cancer worldwide and every year 462000 new cases (4.2% of all cancers) are diagnosed. It is the 6th leading cause of death in the world.[1]

As Iran is on the World belt of esophageal cancer, which is from Turkey to China, esophageal cancer is one of the most common gastrointestinal cancers in Iran especially in the northern and northwest areas. In Iran, the age specific rate in 2006 was 6.27 and 6.11 with standardized mortality rate of 2.46% and 3.53% in females and males, respectively.[2-5]

In southern Iran, esophageal cancer ASR is 1.05 in males and 0.87 in females with more incidence in subjects older than 60 years old.[6] In southeastern Iran, the male to female ratio was 1:1.3 and 60% of patients were between 60 to 80 years old, 75.6% of esophageal cancers were squamous cell carcinoma and 24.4% adenocarcinoma.[7]

There are two types of esophageal cancer

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worldwide: Adenocarcinoma (AC) and Squamous Cell Carcinoma (SCC). Prognosis in both types is poor and 5 year survival rate is 10-13%. Most cases of SCC are between 50-70 years of age and present as locally advanced or disseminated disease. Both types have metastases to local lymph nodes at the time of diagnoses.[8-10] Although prevalence of AC is increasing worldwide, the statistics show that SCC is still the most prevalent type in Iran. Frequency of AC is higher in male population.[5,10]

Esophageal cancer not only decreases the life expectancy, but also causes systemic symptoms which ends in disabilities and lower quality of life. Early diagnoses and treatment will improve both survival rate and duration of life in patients.[11,12] Treatment is different according to the pathology of esophageal cancer (squamous cell vs. adenocarcinoma). AC is usually diagnosed in lower stages than S.C.C. Radiotherapy and surgery are treatments of choice for early stages and chemotherapy is used in advanced cases especially in SCC. Surgery has the most effects on prognosis.[8,13-15] There are two main methods of surgery in esophageal cancer: Trans thoracic (TT) and Tran's hiatal (TH) esophagectomy. In Iran, only a few studies have compared the outcome and complications of the two methods. The aim of this study is to compare TTE and THE according to complications and surgery results in patients with esophageal cancer in Shohada Tajrish Hospital.

Materials and Methods

In this retrospective survey, all the patients with esophageal cancer who had undergone esophagectomy (performed by correspondence's surgery teams) in Shohada Tajrish Hospital, Tehran, Iran from 2000-2008 were studied. A checklist including demographic characteristics (age and sex), anatomical site, tumor pathology and histology, duration of surgery, mean of bleeding during surgery, bedridden duration, complications of surgery (leakage of anastomoses, cardiopulmonary problems and late stenoses 6 month after surgery), morbidity and mortality 30 days after surgery was completed for every patient.

The data were analyzed using SPSS software (version 14, Chicago, IL, USA). Mann-Whitney, Independent-Sample t, Chi-Square, and Fisher Exact tests were used for comparison and p value$\leq$0.05 was considered as statistically significant.

Results

The total number of patients in this study was 100 with a mean age of 61.2 years and male to female ratio of 59/41 (1.43). Sixty nine patients (69%) had S.C.C and 31(31%) had adenocarcinoma of esophagus. Of 100 cases, 59% (40 cases of SCC and 19 cases of A.C) underwent T.H.S and 41 (28 S.C.Cs and 13 A.Cs) underwent TTS. All the patients had epidural catheter before surgery.

Table 1 shows the results of the comparison of patients' demographic features, anatomical site (according to endoscopic criteria) and histopathological characteristics of the tumor in the two methods.

Table 1: Comparison of demographic features, anatomical and histopathological characteristics of tumor in Trans-Torasic vs. Trans-Hiatal esophagectomy

Characteristics			Surgery method		*p* value
			TTE	THE	
Frequency			41	59	----------
Demographic Features	Mean of age		60.3±9.8	61.8±11.3	0.065
	Sex	Male	24 (58.53%)	35 (59.32%)	0.059
		Female	17 (41.46%)	24 (40.67%)	
Anatomical site	Lower 1/3		16 (39.02)	30 (50.84)	0.059
	Middle 1/3		25 (60.97%)	29 (49.15%)	
	Upper 1/3		0	0	
Tumor histology And Pathology	SCC	Stage I	7 (17.07%)	8 (13.55%)	0.070
		Stage II	9 (21.95%)	13 (22.03)	
		Stage III	10 (24.39%)	13 (22.03)	
		Stage IV	2 (4.87%)	6 (10.16%)	
	Aden Ca	Stage I	2 (4.87%)	3 (5.08%)	
		Stage II	5 (12.19%)	8 (13.55%)	
		Stage III	5 (12.19%)	7 (11.86%)	
		Stage IV	1 (2.43%)	1 (1.69%)	

S.C.C was more prevalent than A.C (p=0.000). Most tumors were located in the middle third of the esophagus in both groups with a mean length of 4-6 Cm in endoscopy. (p=0.059)

The mean of the stage was 2.29 in TTS group and 2.36 in THS group. Most patients had stages II and III.

There was no statistically significant difference between the mean of age, sex distribution, anatomical site, tumor type and mean of stage in the two groups. (Table 1) The mean duration of surgery was 398±60.3 min in TTS and 274±48.9 in THS (p=0.000). There was no statistically significant difference between the mean time of hospitalization, blood loss during surgery, complications, mortality and survival rate between the two groups (p=0.065). The leakage of anastomosis was higher in THE (Table 2).

Discussion

Esophageal cancer is the 8th common cancer worldwide. There are two main types of this cancer; AC is more prevalent worldwide and is associated with Barrett's esophagus while SCC is more common in Iran which can be due to predominance of environmental and behavioral risk factors among the population.[5,10]

In this survey, we compared 100 patients with AC or SCC of esophagus who underwent either TTE or THE according to the patient's characteristics, outcomes and complications of TTE and THE. The number of patients with AC was lower than that in SCC in our study (31% vs 69%); this is compatible with epidemiologic results in Iran. The patients' mean age was 61.18 years which is compatible with both national and regional results.[9,10,16,17]

Different studies have compared TTE and THE according to the complications, morbidity and mortality worldwide.

Aghajanzadeh et al evaluated the outcomes of THE in 162 patients with esophageal cancer; most cases were SCC. The need for thoracotomy tube, leakage of anastomoses, pneumonia, and splenectomy due to spleen damages were the most frequent complications. Mortality rate was 14%. They concluded that THE can be used in appropriate patients especially with tumor located in the lower third of the esophagous.[16] Also, Zamani *et al.* compared THE with TTE in 44 patients in Iran. Although the two methods were the same in complications, mortality rate was higher in THE. They concluded that either of methods could be used for treatment according to the patients' clinical situation and surgeons' opinion.[17]

In this respect, Mousavi *et al.* compared complications of thoracic and cervical anastomoses in 510 cases of esophagectomy. Leakage of anastomoses was seen in 65% of intra-thorasic and 35% of cervical anastomoses cases with mortality rates of 16.6% and 11.7%, respectively which were not statistically significant.[18] Moreover, Raz *et al.* believed that Side-to-side stapled intra-thoracic esophagogastric anastomosis is a safe method with a very low rate of anastomotic complications and mortality rate of 27%. They considered this method as procedure of choice for patients with distal esophageal cancers.[19]

Kluta *et al.* studied 40 patients who underwent THE in Romania. Mortality rate was 5% and complications were the same as those in our study.[20] In another study in Germany in 2002, the mortality rate was 14% and 3.8% in TTE and THE, respectively. They mentioned that THE is a suitable method for surgery.[21] In Agboy *et al.*'s study, THE was known as a suitable method for esophageal cancer with a mortal-

Table 2: Comparison of results, complications, mortality and cause of death in Trans-Torasic vs Trans-Hiatal esophagectomy

Characteristic		Surgery method		*p* value
		TTE	THE	
Mean time of surgery (Min)		389±60.3	274±48.9	0.001
Mean of bleeding during surgery (CC)		640±34.6	540±28.2	0.059
Tube thoracostomy		41	25	0.065
Mean of hospitalization (day)		16±1.75	14±1.63	0.065
Mortality within 30 days after surgery		3 (7.31%)	2 (3.38%)	0.059
complications	Leakage of Anastomoses	3 (7.31%)	6 (10.16%)*	0.047
	Cardiopulmonary	4 (9.75%)	3 (5.84%)	0.054
	Late stenoses	4 (9.75%)	5 (8.47%)	0.065
Cause of death	Cardiopulmonary	1 (2.43%)	2 (3.38%)	0.052
	Leakage of anastomoses	1 (2.43%)	1 (1.69%)	0.055

*statistically significant differences in sub groups are shown in colo

ity rate of 14.3%.[22] Maher and coworkers also believed that THE is more effective.[23]

Despite the lower operation time in THE, surgery results and complications (stenosis and need to blood transfusion) did not differ from TTE in our study. Leakage of anastomoses was significantly lower in TTE, but the outcome of leakage in the neck was better in THE. These results are acceptable according to other studies.

Mortality rate of TTE in our study (9.6%) was the same as that of other studies, but the results in THE mortality (2.89%) are much lower than those in other studies.

In conclusion, as there was no difference in surgery results, complication rate and mortality of the two methods, selection of surgery method is dependent on physicians' and patients' opinion. Yet, designing bigger prospective studies are recommended to improve the results.

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