

Transhiatal Esophagectomy: Short and Long-term Outcomes

Mohit Sharma¹, Rachhpal Singh²

Author's Affiliation: ¹Associate Professor ²Assistant Professor, Department of Surgery, Sri Guru Ram Das Institute of Medical Sciences & Research, Amritsar, Punjab 143501, India.

How to cite this article:

Mohit Sharma, Rachhpal Singh. Transhiatal Esophagectomy: Short and Long-term Outcomes. New Indian J Surg. 2020;11(1):39-43.

Abstract

Background: Esophageal cancer is relatively common gastrointestinal tract malignancy with poor prognosis. The aim of the study is to conduct retrospective review of esophageal cancer patients managed by Transhiatal esophagectomy (THE).

Methodology: The study was retrospective analysis of prospective collected data of esophageal cancer patients from June 2010 to June 2019.

Inclusion criteria: Histologically proven carcinoma, medically fit lower third esophageal cancer.

Exclusion criteria: Middle third esophageal carcinoma requiring transthoracic route, metastatic cancer, medically unfit patient, patient refusing consent for surgery.

Results: 575 cases of esophageal cancer were managed in a single unit of surgery. Of these 575 cases, Transhiatal esophagectomy was done in 69 patients. Mean age of the patients was 58 years. Male to female ratio was 15:54. THE alone was done in 18 (25.7%), THE + adjuvant chemotherapy in 24 (34.3%), THE + adjuvant radiotherapy in 12 (17.1%), THE + neoadjuvant chemotherapy 6 (8.6%), THE + neoadjuvant chemoradiotherapy 9 (12.9%). The overall morbidity was 40.5% (14/69). Perioperative mortality was in 5 patients (7.24%). Follow up was done for mean 26.4 months. The mean survival was 19.3 months.

Conclusion: Esophagectomy is complex operation with high morbidity and potential mortality. Multimodality approach appears to be reasonable safe in managing esophageal carcinoma patients.

Keywords: Esophageal cancer; Transhiatal esophagectomy; Morbidity; Multimodality therapy.

Introduction

Esophageal cancer is the seventh most common cancer, worldwide. In India it is the sixth most common cancer and sixth most common cause of cancer related death.¹ Squamous cell carcinoma is the most common type of esophageal carcinoma in India and is most commonly located in distal one-third of esophagus. The overall survival in esophageal cancer remains poor despite advances in multidisciplinary care. Esophagectomy remains the only curative approach to esophageal carcinoma. Depending upon the location of tumor surgery is performed via thoracic, abdominal or combined approach. We present our experience with transhiatal esophagectomy (THE) in patients of carcinoma esophagus. The patient characteristics, surgical approach and outcome are presented and discussed.

Materials and Methods

A retrospective analysis of prospectively maintained data of esophageal cancer from June 2010 to June 2019 was done. The preoperative work up of esophageal cancer included upper GI endoscopy and biopsy, computerized tomography of chest and abdomen, echocardiography and pulmonary

Corresponding Author: Mohit Sharma, Associate Professor, Department of Plastic Surgery, Sri Guru Ram Das Institute of Medical Sciences & Research, Amritsar, Punjab 143501, India.

E-mail: drmohit.gis@gmail.com

Received on 22.11.2019, **Accepted on** 04.01.2020

function test. PET CT scan was used selectively. Staging was performed using 8th American joint committee on cancer/International union against cancer TNM classification. Esophagectomy was considered for medically fit patients with localized resectable lesion at middle and distal one-third esophagus. Locally advanced carcinoma (T3 and or N1) were subjected to neoadjuvant therapy (chemo and/or radiotherapy) with the intention of esophagectomy after regression of lesion. In general carcinoma of lower one-third esophagus were selected for transhiatal route.

Inclusion Criteria

Histologically proven carcinoma, medically fit lower third esophageal cancer.

Exclusion Criteria

Middle third esophageal carcinoma requiring transthoracic route, metastatic cancer, medically unfit patient, patient refusing consent for surgery. Midline incision was given, after excluding metastases gastric mobilization done using harmonic scalpel. The lymph nodes removed included perigastric, hepatic artery and accessible mediastinal. Gastric conduit through the posterior mediastinum was the preferred replacement. Hiatus was widened by dividing diaphragmatic crus. Chest tube was inserted only after obvious pleural rupture. The esophagogastric anastomosis was performed in neck using single layer interrupted 3-0 mersilk suture after excising gastric crescent either from anterior or posterior wall of stomach. Our policy is not to perform pyloric drainage procedure and to do feeding jejunostomy in all the patients. Postoperatively patients were managed in ICU for 1 or 2 days. Enteral nutrition was started on postoperative day 2. Perioperative mortality was defined as in hospital mortality or within 30 days mortality. After discharge patients were followed up every 6 month with clinical examination and X-ray chest. Adjuvant chemotherapy and/or radiotherapy were given for Stage II onwards at the discretion of medical and radiation oncologist. Statistical analysis was done using SPSS software version 24. Survival analysis was performed using Kaplan-Meier method.

Results

Over a period of nine years, from June 2010 to June 2019, 575 cases of esophageal cancer were managed in a single unit of surgery. Of these 575 cases, Transhiatal esophagectomy was done in 69

patients. Rest of the patients were managed with chemoradiotherapy alone, esophageal stenting and Transthoracic esophagectomy.

Demography profile of these 69 patients summarized in Table 1. Mean age of the patients was 58 years. Male to female ratio was 15:54. Alcohol abuse was found in 12 (17.4%) patients and tobacco abuse in 9 (13.4%) patients. Majority of patients presented with dysphagia to solids with median duration of symptoms of 60 days before the start of definitive treatment.

Table 1: Demographic characteristics

Mean age (years)	58
Male: Female	15:54
Alcohol abuse	12 (17.4%)
Tobacco abuse	9 (13.4%)
Median duration of symptoms (days)	60
Mean duration of surgery (hours)	4.5
Average hospital stay	12

Mean operative time was 4.5 hours. Average hospital stay was 10 days. THE alone was done in 18 (25.7%), THE + adjuvant chemotherapy in 24 (34.3%), THE + adjuvant radiotherapy in 12 (17.1%), THE + neoadjuvant chemotherapy 6 (8.6%), THE + neoadjuvant chemoradiotherapy 9 (12.9%) (Table 2).

Table 2: Treatment detail

Treatment	No. of patients
THE only	18
THE + Adjuvant radiotherapy	12
THE + Adjuvant chemotherapy	24
THE + Neoadjuvant chemoradiotherapy	9
THE + Neoadjuvant chemotherapy	6

The overall morbidity was 40.5% (14/69). Morbidity is being detailed in Table 3. Majority of the complications were respiratory (pneumonia, atelectasis) in 8 (11.6%) cases, anastomotic leak in 6 patients (8.6%) and anastomotic stenosis in 3 cases. Anastomotic stenosis was managed with repeated esophageal dilatation. Unilateral recurrent laryngeal nerve paralysis occurred in 1 patient. This patient presented with hoarseness in the immediate postoperative period. Conservative management was successful in managing this patient. Delayed gastric emptying occurred in 2 patients. One patient settled with the use of prokinetic agents (metoclopramide, domperidone and erythromycin) whereas in another patient delayed gastric emptying persisted despite use of prokinetic agents.

Table 3: Complications

Complication	No. of patients
Pneumonia, Basal atelectasis	8
Recurrent laryngeal nerve palsy	1
Anastomotic leakage	6
Anastomotic stenosis	3
Delayed gastric emptying	2

This patient was successfully managed with endoscopic balloon dilatation. Perioperative mortality was in 5 patients (7.24%). All of these patients had respiratory failure secondary to pneumonia. Stagewise distribution as per AJCC 8th classification was as follow (Table 4). Most common was Stage IIA 27 (39.1%) followed by Stage IIIA in 15 (21.7%), ypI 6 (8.7%), IIB 6 (8.7%), IVA 6 (8.7%), IIB 6 (8.7%), IA 3 (4.3%), ypIIIA with 3 (4.3%) cases

in each group. Stagewise survival shown in Fig. 1. R0 resection was achieved in all patients. Mean number of lymph nodes harvested from specimen were 9.74. Follow up was done for mean 24.3 months. Till date 37 patients are surviving. Mean survival of patients was 19.3 months (Table 4).

Table 4: Stagewise distribution

Stage	No. of patients n (%)
IA	3 (4.3)
IIA	27 (39.1)
IIB	6 (8.7)
IIIA	15 (21.7)
IIB	3 (4.3)
IVA	6 (8.7)
ypI	6 (8.7)
ypIIIA	3 (4.3)

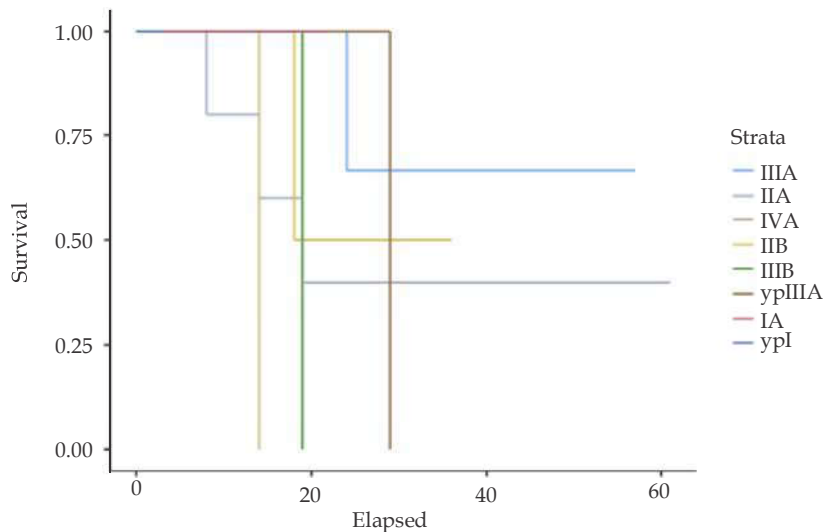


Fig 1: Stage wise survival curve.

Discussion

Carcinoma of esophagus is an aggressive malignancy and usually presents at an advanced stage at the time of diagnosis. Only 20% patients have localized disease, whereas 30% have locally advanced and more than 50% are metastatic at the time of presentation.^{2,3} In our series too only 69 patients were suitable for definitive resection out of 575 diagnosed esophageal cancer cases managed in our unit. In view of absence of proper referral system in our region majority of patients had delayed referral. Median duration of symptoms 60 days at the time of admission. History of alcohol intake and tobacco abuse was found only in minority of patients 12 (17.4%) and 9 (13.4%).

This could be attributed to more female than male patients in our series (15:54). Intake of hot beverages could have been the factor responsible for the esophageal cancer in female gender. Das et al.⁴ in their study on analysis of risk factor for squamous cell carcinoma have incriminated poor nourishment and consumption of hot beverages as cause of squamous cell carcinoma in esophagus. Surgery remains the important component of the management of this disease, however only minority of the patients are suitable for the same. Presently multimodality treatment is advocated for majority of the cases. The use of multimodality approach has shown improvement in survival of locally advanced carcinoma.⁵ In our own series surgical approach alone was done in 18 (25.7%) patients.

Majority of the esophageal cancer cases received multimodality treatment in the form of adjuvant or neoadjuvant chemotherapy and radiotherapy (Table 2).

Esophagectomy is a major surgery that carries high morbidity and mortality. The Transhiatal approach was rediscovered by Orringer in 1976.⁶ The Transhiatal approach is based on the rationale that avoidance of Transthoracic route reduces the risk of pulmonary complications and intrathoracic anastomosis leak. However the points against Transhiatal approach is that it violates basic principles of oncological surgeries. There is poor exposure to esophagus in absence of thoracotomy, lack of adequate mediastinal lymphadenopathy resulting in higher rate of locoregional recurrence and poor overall survival.^{7,8} The overall morbidity of Transhiatal esophagectomy in our study was 40.5%. Respiratory complications were the most common. This is consistent with the incidence of morbidity reported in literature.⁹⁻¹¹ In a meta-analysis Zhou et al.¹² have shown that minimally invasive esophagectomy has lesser pulmonary complications than open esophagectomy without any difference in anastomotic leak rate. The anastomotic leak rate in our series was 8.6%. The leak rate after cervical esophagogastric anastomosis has been reported between 9 and 11% in the literature. Technical factors and ischemia of transpositioned gastric tip are considered to be important causative factors.^{13,14} In our series almost all of our patients were managed conservatively with opening of cervical wound and drainage of anastomotic dehiscence area with encouragement of semisolid diet intake. Orringer et al. have shown that use of side-to-side stapled esophagogastric anastomosis has reduced the leak rate to 2.7%.¹⁵ Sokuti et al.¹⁶ in their study on anastomotic technique has concluded that use of wide cross-sectional hand sewn esophagogastric anastomosis decreases rate of stricture formation. Anastomotic stenosis occurred in 3 patients, all these patients had anastomotic leaks. These patients were successfully managed with repeated esophageal dilatation. Left recurrent laryngeal nerve paresis happened in one patient, paresis got resolved with conservative method.

The mortality in our study was 7.24%. Neagoe et al.¹⁷ in their series on Transhiatal esophagectomy have reported mortality of 9.09%. Similar results have been reported by Birkmeyer et al.¹⁸

Limitation of our study is that it is a single center and retrospective in nature. Follow-up period was short, i.e. 19.3 months.

Conclusion

Esophagectomy is a complex procedure with high morbidity and potential mortality. Transhiatal esophagectomy is a relatively safe approach with adequate oncological results. Multimodality approach has the potential to improve the survival of the esophageal cancer patients.

References

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL et al. Global cancer statistics 2018: Globocan Estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018 Nov;68(6):394-24.
2. Zhang Y. Epidemiology of esophageal cancer. *World J Gastroenterol* 2013 Sep 14;19(34):5598-06.
3. Falk GW. Risk factors for esophageal cancer development. *Surg Oncol Clin N Am* 2009 Jul;18(3):469-85.
4. Das KC, Singh S, Pawar G et al. Risk factors analysis of squamous cell carcinoma esophagus in North Indian females in tertiary care hospital: A case-control study. *Int J Recent Sci Res* 2015 June;6(6):4661-4.
5. Sjoquist KM, Burmeister BH, Smithers BM, et al. Survival after neoadjuvant chemotherapy or chemoradiotherapy for resectable oesophageal carcinoma: and updated meta-analysis. *Lancet Oncol* 2011 Jul;12(7):681-92.
6. Orringer MB, Marshall B, Chang AC, et al. Two thousand Transhiatal esophagectomies, Changing trends, Lessons Learned. *Ann Surg* 2007 Sep;246(3):363-74.
7. Neagoe RM, Sala D, Voidazan S et al. Transthoracic versus transhiatal esophagectomy: a permanent dilemma. Our 15 year experience. *Chirurgia (Buc)* 2018;108:780-87.
8. Davies AR, Forshaw MJ, Khan AA. Transhiatal esophagectomy in a high volume institution. *World J Surg Oncol* 2008 Aug 20;6:88
9. Rindani R, Martin CJ, Cox MR. Transhiatal versus Ivor-Lewis oesophagectomy: is there a difference? *Aust N Z Surg* 1999;69(3):187-94.
10. Hulscher JB, Tijessen JG, Obertop H, et al. Transthoracic versus transhiatal resection for carcinoma of the esophagus: a meta-analysis. *Ann Thorac Surg* 2001;72(1):306-13.
11. Vijayakumar M, Burrah R, Hari K, et al. Esophagectomy for cancer of the esophagus. A regional cancer centre experience. *Indian J Surg Oncol.* 2013;4(4):332-335. doi:10.1007/s13193-

- 013-0260-9.
12. Zhou C, Zhang L, Wang H, et al. Superiority of minimally invasive oesophagectomy in reducing In- hospital mortality of patients with resectable esophageal cancer: A meta-analysis. *PLoS One*. 2015 Jul 21;10(7):e0132889.
 13. Urschel JD. Esophagogastronomy anastomotic leaks complicating esophagectomy: A review. *Am J Surg* 1995 Jun;169(6):634-40.
 14. Urschel JD. Gastric conditioning. *Recent Results Cancer Res* 2000;155:135-44.
 15. Orringer MB, Marshall B, Lannettoni MD. Eliminating the cervical esophagogastric anastomotic leak with a side-to-side stapled anastomosis. *J Thorac Cardiovasc Surg* 2000 Feb;119(2):277-88.
 16. Sokouti M, Golzari SE, Pezeshkian M, et al. The Role of Esophagogastric Anastomotic Technique in Decreasing Benign Stricture Formation in the Surgery of Esophageal Carcinoma. *J Cardiovasc Thorac Res* 2013;5(1):11-16. doi:10.5681/jcvtr.2013.003.
 17. Neagoe R, Voidazan S, Szocs M, Sala DT, Bancu S, Mulhfay G. Outcomes after transhiatal esophagectomies in an eastern-European low-volume center. *Balkan Med J* 2015;32(1):38-45. doi:10.5152/balkanmedj.2015.15514.
 18. Birkmeyer JD, Sun Y, Wong SL, et al. Hospital volume and late survival after cancer surgery. *Ann Surg* 2007 May;245(5):777-83.
-
-