



Esophagectomy for Cancer of the Esophagus- GMC Jammu Experience

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Abstract

We retrospectively reviewed a data of 202 patients, who underwent esophagectomy for cancer of the esophagus over 12 years at GMC, Jammu. Out of 262 patients, 202 patients underwent esophagectomy, mean age was 53 years, ranging between 31-75 years. 160 patients had squamous cell carcinoma and 31 patients had adenocarcinoma. 148 patients underwent transhiatal esophagectomy (Orringer's procedure), whereas 18 patients underwent McKeown's three incision procedure and 10 patients underwent transthoracic esophagectomy (Ivor Lewis) procedure. It was observed that mid third tumors accounted for 40%, lower third tumors accounted for 55 % and GE junction tumors 5% of the cases. Squamous cell carcinoma was the most common histology (79.5 %). The overall morbidity (significant complications leading to prolonged hospitalization) was 38 %. Perioperative mortality was 13(6.43%). We hereby conclude that esophagectomy is a major surgical operation and gives palliation of dysphagia to patient and our experience with it has been with acceptable morbidity and with favorable short-term results.

Key Words

Esophagectomy, Transhiatal esophagectomy (THE), Transthoracic esophagectomy (TTE)

Introduction

Esophageal cancer remains an aggressive malignancy and is expected to be one of the three major gastrointestinal cancers in India accounting for 18.6 % of cases (1). In India, it is the fourth most common cause of cancer-related deaths. With the estimated incidence in India in the year 2008 was 48,099 (5.1 %) with a mortality of 43,351 (6.8 %) (2). Surgery is the best option for cure in early-stage esophageal cancer and remains the superior modality for local control in locally advanced disease (3). We at GMC, Jammu present our experience with the surgical management of patients with esophageal cancer. The patient's characteristics, and surgical approach and outcome are presented and discussed.

Material and Methods

Between February 2006 and October 2018, 262 patients with esophageal cancers presented at GMC, Jammu. Patients were evaluated for surgery by doing a barium swallow, upper gastrointestinal endoscopy and biopsy, and computerized tomography (CT) scan of the

chest and abdomen for assessment of tumor spillage. Bronchoscopy was done for patients with mid third lesions. Pre-operative hematological and biochemical tests, pulmonary function test and cardiac evaluation were done for all patients. Surgery was considered for medically fit patients with lesions at the mid and lower third of the esophagus. Patients with upper esophageal tumors were sent to oncology. Of the 262 patients, 202 patients underwent esophagectomy and were available for this study. 60 patients were sent to oncology department. Informed consent was taken from all patients before the surgery. Approach in all patients was through midline laparotomy. Patients underwent esophagectomy and upper partial gastrectomy. The preferred approach was transhiatal (Orringer's), however, in certain cases right transthoracic (Ivor Lewis) approach and three incision i.e. midline laparotomy, right sided thoracotomy and neck incision (McKeown's approach) was also used especially lesions close to the carina and bulky mid third lesions. Selected cases of mid third lesions below the

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carina were resected through the transhiatal route. We preferred to prepare a narrow gastric tube placed in the anatomical pre-vertebral position. The advantages of a narrow gastric tube are that it can be pulled up easily to the neck without tension, its excellent elasticity and reduced mediastinal encumbrance. The anastomosis was mostly performed in the neck other than in the Ivor Lewis approach where the anastomosis was fashioned in thorax by hand sewn technique and a feeding jejunostomy were done for all patients.

Most patients were extubated in the theatre following the surgery, observed in the ICU and shifted out to the step-down unit once stable. Stiff antibiotics, aggressive chest physiotherapy, spirometer exercises and bronchodilators were administered for all patients. Enteral feeds were started on the 3rd post-operative day. Bedside test feeds were given on the 5th-7th post-operative day and gradually escalated to semisolids and normal diet if there was no leak. In the event of a leak, the neck wound was opened and managed conservatively.

Results

The evaluable group consisted of 202 patients who under esophagectomy between February 2006 to October 2018. The demographic details of the patients are shown in *Table 1*. The male to female ratio was 4:3 and the median age was 53 years (range 31 to 75 years). The most common symptom at presentation was dysphagia (95 %) followed by vomiting (24 %). The most common risk factor in males was smoking (65 %) and in females was tobacco chewing (45 %). Mid third tumors accounted for 40% lower third tumors accounted for 55 % and GE junction tumors 5% of the cases. Squamous cell carcinoma was the most common histology (79.5 %).

The results of the surgery are shown in *Table 2*. Transhiatal approach was done in 148 patients, transthoracic (Ivor Lewis) in 10 and McKeown “three incision esophagectomy” in 18 patients. In 24 patients palliative procedure in form of feeding jejunostomy had to be done because of non resectability of tumor, whereas 2 patients underwent esophagectomy through left thoracoabdominal approach of Sweets Perioperative mortality was 13 (6.43 %), seven patients died due the respiratory complications, two because of pulmonary embolism, one due to post-operative coronary event and three patient due to anastomotic leak and septicemia. The details of morbidity encountered are shown in *Table 3*. The overall morbidity (significant complications leading to prolonged hospitalization) was 38 %.

Table 1: Demographics Characters of Patients

Median age (range) years	53 (31–75)
Gender	
Male	129 (57 %)
Female	73 (43 %)
Presenting symptoms	
Dysphagia	194 (95 %)
Vomiting	56 (24 %)
Cough	12 (7 %)
Weight loss	58(25%)
Pathology	
Squamous cell carcinoma	160 (79.5 %)
Adenocarcinoma	31 (15 %)
Poorly differentiated carcinoma	11 (5.5 %)
Tumor location	
Middle third	81 (40 %)
Lower third GE Junction	111 (55 %) 10(5%)

Table 2: Results of Surgery

	Transhiatal	McKeown’s	Ivor Lewis
Number of surgeries	148	18	10
Palliative procedure	22	0	2
Mean ICU stay (days)	4	5	5
Mean post-operative stay (days)	14	18	18
Respiratory complications	45	06	03
Mortality	9	1	2

Intraoperatively three patients underwent splenectomy because of intraoperative injury to spleen or splenic vascular pedicle. Two patients had significant intraoperative bleeding requiring a thoracotomy to control the bleeding. One patient had a tracheal tear of the membranous trachea which was successfully repaired

**Table 3: Complications**

	Number (%)
Pleural tear	43 (21%)
Respiratory complications	54 (27%)
Anastomotic leak	13 (6 %)
Stricture	32 (15 %)
Wound infection	12 (6 %)
RLN palsy	21 (10.39%)
Chyle leak	4(2%)
Tracheal injury	1(0.5%)

Table 4: Actuarial Survival Following Esophagectomy

Site	No.	6 Months	12 Months	36 Months	60 Months
Middle third	80	64	51	35	23
Lower third	111	87	73	49	35
G E Junction	11	8	6	4	2
Total	202	159	130	89	60

through a right thoracotomy whereas in perioperative period entry into one or both pleural cavities was apparent on routine inspection of the pleura through the hiatus after completion of the esophagectomy or was detected in ICU in 43(21%) patients and was treated with placement of a chest tube. Left recurrent laryngeal nerve paresis with resulting hoarseness occurred in 21 patients. The hoarseness resolved spontaneously within 2 to 12 weeks of operation in all but four patients.

Respiratory complications (atelectasis, pneumonia) were the most common 54 (27 %). Anastomotic leak occurred in 13 patients (6 %) and all were managed conservatively. Anastomotic stricture occurred in 32 patients (15 %), they were managed with either endoscopic dilatation or with oral Foley's catheter dilatation or both. Chyle leak was noticed in 4 patients and 3 of them happened to the patients who underwent TTE (Ivor Lewis) procedure and one in McKeown's procedure.

Patients were advised to follow-up every 3 months for the first 2 years, 6 monthly for the next 3 years and annually thereafter. At the annual visit they were subjected to blood tests (hemogram & biochemistry), and CT scan of the chest and abdomen. Other investigations like upper GI endoscopy or PET Scans were done as per the clinical

condition of the patient. Actuarial survival rate at 6 months, 12 months, 36 months and 60 months were 79%, 64%, 44% and 29.7% respectively (Table 4).

Discussion

Esophageal cancers are highly lethal malignancies associated with poor prognosis. Only about 50 % of patients present with localized disease (4,5) and can therefore be considered for curative treatment. Survival rates have, however, been poor in these patients, i.e. 37 % for localized disease and 19 % for node positive disease (5). In order to reduce the incidence of perioperative morbidity and mortality a transhiatal approach can be used. Several studies in fact demonstrated that the risks of respiratory complication, wound dehiscence, chylous leakage, and infection are higher after transthoracic esophagectomy than transhiatal approach (6). Also, the intensive care unit and the hospital length of stay are significantly longer after transthoracic approach.

The result of our study shows that lesions in the mid third below the carina have also been resected successfully through the transhiatal route. We could perform 148 THE and in only 28 TTE or McKeown's procedure was performed. Orringer (7) has stated that in performing THE, after mobilization of the visceral esophageal substitute (generally stomach) is complete, resectability of the esophagus is determined by palpation through the diaphragmatic hiatus. Although the surgeon must be prepared to perform a thoracotomy or esophageal bypass if extensive fixation of the tumor-containing portion of the esophagus to adjacent structures is encountered. In his series of 104 consecutive patients with carcinoma of the intrathoracic esophagus, THE has been possible in 100, local tumor extension necessitating standard transthoracic esophagectomy or esophageal bypass in 4 cases only.

The overall morbidity of esophagectomy in our study was 38% mainly attributed to respiratory complications like atelectasis and pneumonia. Several studies have demonstrated that the risks of respiratory complication, wound dehiscence, chylous leakage, and infection are higher after transthoracic esophagectomy (8) than transhiatal approach. Also, the intensive care unit and the hospital length of stay are significantly longer after transthoracic approach.

The anastomotic leak we encountered was 6% and there were three mortalities associated with the leak owing to septicemia. Our experience with intrathoracic anastomosis following esophagectomy was associated



with significant mortality if the patient had anastomotic leak so shifting the anastomosis to the neck has significantly reduced our mortality rates and therefore has become the standard at our center. The reported leak rate with cervical anastomosis is between 9 and 14 % (9). Advantages of the cervical anastomosis include more extensive resection of the esophagus, the possibility of avoiding thoracotomy, less severe symptoms of reflux, and less severe complications related to anastomotic leak. Advantages of the thoracic anastomosis include an extensive periesophageal lymph node clearance and a lower stricture rate (10).

The anastomotic stricture rate in the study was 15 %. These patients were treated with endoscopic dilatation. Manjunath *et al.* (11) has described the management of anastomotic strictures by endoscopic dilatation or by transoral Foley's catheter self-dilatation or by a combination of both methods. Orringer *et al.* reported a stricture rate of about 20 % in their experience and advocates a liberal policy of dilatation in the postoperative period (12).

Skinner (13) in his discussion about Orringers transhiatal esophagectomy has expressed reservations about adequate esophageal resection and formal lymph node dissection to patients with potentially curable tumors in this procedure as he advocates radical esophagectomy and en bloc dissection through a transthoracic approach. However, in most patients with esophageal carcinoma, the goal of esophagectomy is palliation, not cure, and if the latter should somehow be achieved, it is more a function of individual tumor biology and host resistance rather than the extent of the resection performed. Omloo *et al.* (14) compared extended transthoracic resection with transhiatal resection for adenocarcinoma of the mid/distal esophagus and concluded that there is no significant overall survival benefit for either approach. However, compared with limited transhiatal resection extended transthoracic esophagectomy for type I esophageal adenocarcinoma shows an ongoing trend towards better 5-year survival (15).

Conclusion

Surgical resection is currently the treatment of choice for patients with resectable esophageal carcinoma. Although there are still several controversies regarding the optimal management of these patients with evidence of multimodality treatment emerging, based on more than 12-year experience, our current and preferred approach is to perform a transhiatal esophagectomy with cervical

mechanical anastomosis which has given optimal results. Outcomes after esophagectomy may be optimized by thorough staging, careful patient selection and preparation, and strict attention to the evaluation and management of postoperative complications, mainly pulmonary.

References

1. Takiar R, Nadayil D, Nandakumar A. Projections of number of cancer cases in India (2010–2020) by cancer groups. *Asian Pac J Cancer Prev* 2010;11(4):1045-49.
2. Samarasam I. Esophageal cancer in India: Current status and future perspectives. *Int J Adv Med Health Res* 2017;4:5-10.
3. Thomas A. D'Amico. Outcomes after surgery for esophageal cancer. *Gastrointest Cancer Res* 2007;1(5):188-96.
4. Lund O, Hasenkam JM, Aagaard MT, Kimose HH. Time-related changes in characteristics of prognostic significance in carcinomas of the oesophagus and cardia. *Br J Surg* 1989;76(12):1301-07.
5. National Cancer Institute. Surveillance epidemiology and end results. Available from: <http://seer.cancer.gov/statfacts/html/esoph.html>. Accessed February 10, 2013.
6. Goldminc M, Maddern G, Le PE. Esophagectomy by a trans hiatal approach or thoracotomy: a prospective randomized trial. *Br J Surg* 1993;80:367-70.
7. Orringer MB. Transhiatal esophagectomy without thoracotomy for carcinoma of the thoracic esophagus. *Ann Surg* 1984;200(3):282-87.
8. Jacobi CA, Zieren HU, Muller JM, *et al.* Surgical therapy of esophageal carcinoma: the influence of surgical approach and esophageal resection on cardiopulmonary function. *Eur J Cardiothorac Surg* 1997;11:32-37.
9. Cooke DT, Lin GC, Lau CL, Zhang L, Si MS, Lee J, *et al.* Analysis of cervical esophagogastric anastomotic leaks after transhiatal esophagectomy: risk factors, presentation, and detection. *Ann Thorac Surg* 2009;88(1):177-84.
10. Atkins BZ, Shah AS, Hutcheson KA, *et al.* Reducing hospital morbidity and mortality following esophagectomy. *Ann Thorac Surg* 2004;78:1170-76.
11. Manjunath S, Ramachandra C, Veerendra Kumar KV, Prabhakaran PS. Simple dilatation of anastomotic strictures following oesophagectomy in unsedated patients. *Eur J Surg Oncol* 2006;32(9):1015-17.
12. Orringer MB, Marshall B, Chang AC, Lee J, Pickens A, Lau CL. Two thousand transhiatal esophagectomies: changing trends, lessons learned. *Ann Surg* 2007;246:363-72.
13. Skinner DB. En bloc resection for neoplasms of the esophagus and cardia. *J Thorac Cardiovasc Surg* 1983;85(1):59-71.
14. Omloo JM, Lagarde SM, Hulscher JB, Reitsma JB, Fockens P, van Dekken H, *et al.* Extended transthoracic resection compared with limited transhiatal resection for adenocarcinoma of the mid/distal esophagus: five-year survival of a randomized clinical trial. *Ann Surg* 2007;246(6):992–1000.
15. Mariette C, Taillier G, Van Seuning I, Triboulet JP. Factors affecting postoperative course and survival after en bloc resection for esophageal carcinoma. *Ann Thorac Surg* 2004;78(4):1177-83.