



## ESOPHAGECTOMY IN REGIONAL CANCER CENTRE OF EASTERN INDIA: OUR EXPERIENCE.

**Arghya Basu\***

MBBS (HONS.), MS(General Surgery), DNB (General Surgery), DNB (Surgical Oncology), MNAMS (Delhi), MRCS (London,UK), FACS (USA), FMAS (AMASI), FIAGES, FACRSI, FISCIP Consultant Surgical Oncologist & EX-IN Charge, Dept. Of Oncology, B. R. Singh Hospital & Research Centre, Eastern Railways, Kolkata, West Bengal, India. \*Corresponding Author

**Jagjit Kumar Pandey**

M.Ch (Surgical Oncology), Assistant Professor & Head, Dept. Of Surgical Oncology, All India Institute Of Medical Sciences, Patna, Bihar, India

**Soumika Biswas**

MD (Biochemistry), Assistant Professor, Dept. Of Biochemistry, Medical College & Hospital, Kolkata, West Bengal, India.

### ABSTRACT

**Introduction** Radical surgery is the chief component of treatment in resectable esophageal cancers with ample controversies regarding type, extent and nature of radical surgeries to be performed.

**Materials And Methods** We share our experience with esophagectomies for cancer involving lower two-thirds of esophagus between February 2017 to February 2018 with 20 patients at Chittaranjan National Cancer Institute, Kolkata. The pre, intra and post-operative factors, morbidity and mortalities were studied. **Results** Transhiatal esophagectomy was performed in 5 patients and transthoracic esophagectomy was performed in 15 patients. The most common location was in lower third of esophagus and squamous cell carcinoma was most common histopathology. The common complications encountered were respiratory (25%), anastomotic leak (5%) and anastomotic stricture (20%). Complication was higher in transthoracic group. R0 resection rate was 90%. **Conclusion** Esophagectomy can be performed with acceptable morbidity in patients with esophageal cancer. Higher volume, surgical expertise, good patient selection and meticulous anastomotic technique enhances the outcome of surgery.

### KEYWORDS :

#### INTRODUCTION

Esophageal cancer is one of the common malignancies of gastrointestinal system encountered in regional cancer centres in India. It is associated with very high mortality and morbidity. These cancers pose a very challenging issue to the clinicians because of late presentation and lack of early screening tests. Although multimodality treatment protocols have been prescribed for them but most of the cases present in locally advanced or metastatic stage, hence scope of curative surgery is sparsely available. Surgery plays a pivotal role in protocols with curative treatment but can be performed only in anaesthetically fit patients with growth involving lower two thirds of esophagus whereas growths involving upper third of esophagus are mainly treated by concurrent chemoradiotherapy [1]. We present our experience of esophagectomy done in patients with esophageal cancer in Chittaranjan National Cancer Institute (CNCI), a Regional Cancer Centre of Eastern India.

#### MATERIAL & METHODS

##### Patients

Between February 2017 to February 2018, total 207 patients with esophageal cancer presented to CNCI, Kolkata. Preoperatively patients were evaluated with upper g.i. endoscopy, endoscopic biopsy, computerised tomographic (CT) scans of thorax and abdomen. Patients having growth involving middle third of esophagus were also investigated with bronchoscopy if bronchial invasion was clinically suspected. Routine haematological and biochemical parameters, 2-D echocardiography and pulmonary function tests were performed in all patients. Surgery was offered to patients having growths at lower two thirds of esophagus. Spirometry, aggressive chest physiotherapy, high protein diet and bronchodilators were started preoperatively. Out of these 467 patients, only 25 patients were found suitable for surgery. Informed

consent was taken from all the patients before any intervention or procedures.

##### Surgical Technique

All the patients were treated with subtotal esophagectomy and partial gastrectomy either by transhiatal or transthoracic route. Transhiatal route was preferred for adenocarcinomas involving lower third of esophagus. Lesions close to the carina and bulky growths involving middle third of esophagus were excised by transthoracic route. While operating by transhiatal route perigastric, celiac and accessible mediastinal nodes were removed whereas periesophageal nodes were removed enbloc while operating through transthoracic route. Esophageal replacement was done by stapled gastric conduit which was brought upto neck via posterior mediastinum. The esophago-gastric anastomosis was performed always in the neck by hand-sewn technique. Gastric drainage procedure in the form of pyloroplasty or pyloromyotomy and a feeding jejunostomy (FJ) was done in all patients.

##### Post-operative care

All the patients were extubated in the operation theatre after surgery, observed in Surgical ICU and shifted to the ward after stabilisation over a few days. Aggressive chest physiotherapy, total parenteral nutrition and FJ feed, spirometry and bronchodilators were advised in all the patients. Fluid challenge was given by FJ on the 2<sup>nd</sup> post-op day and enteral feed was started by FJ on the 3<sup>rd</sup> post-op day which was gradually escalated. Oral feeds were started on 7<sup>th</sup> post-op day after doing a gastrograffin / barium swallow (to check any possible cervical leak) and gradually converted to semisolid and normal feed in absence of any complication. In case of suspected leak, the neck wound was opened immediately and managed conservatively.

**Follow-up**

Post-operatively, all patients were advised monthly follow-up for the first 6 months, then 3-monthly for 1 year and 6 monthly thereafter for the next 3 years. The patients were evaluated by physical examinations as well as routine biochemical, haematological tests and CT scans of thorax and abdomen on annual follow-up visit. Patients receiving adjuvant RT/CCRT (Concurrent Chemoradiotherapy) were evaluated by Medical and Radiation Oncology departments also.

**RESULTS**

We evaluated 25 patients who underwent esophagectomy between February 2017 to February 2018 at CNCI, Kolkata. The demographic details of our patients are described in Table I.

Results of esophagectomies are summarised in Table II. We performed transhiatal esophagectomy (THE) in 5(20%) patients and transthoracic esophagectomy (TTE) in 20(80%) patients. Operative time was more in TTE (250-320 min) than THE (200-280 min). Requirement for blood transfusions was also more in TTE (3.8 units) than THE (3.2 units). Post-operative ICU stay was more in TTE (5 days) than THE (3 days). Total post-operative hospital stay was also more in TTE (15 days) than THE (12 days). We encountered no mortality in our study. Rate of respiratory complications was significantly higher in TTE (55%) than THE (20%).

The details of the morbidities observed in our study are depicted in Table III. We encountered respiratory complications like atelectasis, pneumonia, surgical emphysema etc. in 12(48%) of our patients. Cervical esophagogastric anastomotic leak was observed in 2(8%) patients who were managed conservatively successfully without any mortality. Anastomotic stricture was observed in 4(16%) patients who were treated by endoscopic dilatation. Recurrent laryngeal nerve injury leading to transient hoarseness of voice was seen in 1(4%) patient. Chyle leak was seen in 1(4%) patient belonging to the THE group which was managed conservatively. Surgical site infection (SSI) was observed in 2(8%) patients.

The oncological outcomes of surgery are tabulated in Table IV. We followed the AJCC staging system (7<sup>th</sup> edition) for staging purpose. Mean Lymphnodal harvest was 9 in THE group (range 3-18) and 14 in TTE group (range 6-28).

**DISCUSSION**

Esophageal cancers are highly aggressive cancers infamous for very poor prognosis. Less than half of patients present with localised disease and therefore, very few patients can actually be offered curative treatment. Survival rate is less than 40% for localised disease and less than 20% for locally advanced disease [2]. Multimodality treatment protocols have been prescribed at various centres worldwide but a full-proof treatment regime is yet to be developed. Surgery with curative intent plays a major role in resectable cancers but is associated with numerous controversies. THE vs. TTE is an age-old debate in surgical oncology. Numerous trials have been performed comparing these two treatment modalities but most of them failed to establish any survival difference.

However, THE has been found to have better survival for adenocarcinomas of the lower esophagus by Omloo et al. (2007) and TTE has been found to have better survival for squamous cell carcinomas without any overall survival advantage between the groups [3]. Two large meta-analysis by Rindani et al. (1999) [4] and Hulscher JB et

al. [5] failed to show any survival difference between the groups.

The result of our study showed a distinct trend towards utilization of TTE (20 vs. 5). The overall morbidity in our study was 53%. Respiratory complications were the most common complication encountered (48%) and were more common in TTE group. Patients treated with TTE also had longer duration of surgery, hospital stay and requirement of blood transfusion.

These results are well in line with recognised multicentric randomised trials. There was no mortality in our study. It has now become evident that high volume at dedicated centres and surgical experience can significantly reduce morbidity and mortality of esophagectomy. Survival and quality of life might be higher in higher volume centres.

Cervical esophagogastric anastomotic leak was observed in 2(8%) of our patients, however, there was no mortality out of leak. Previously we used to perform intrathoracic anastomosis but now we are routinely performing cervical anastomosis. It greatly reduced mortality and hence it has become the standard of practice at our centre now. The reported leak rate with anastomosis in neck is between 10-12%.

The leak rate was much lower in stapled anastomosis described by Orringer [6] but we have performed only hand-sewn anastomosis in our study to reduce the cost of the surgery. But the leak rate in our study may not be considered conclusive due to very small number of patients compared to larger trials performed worldwide with much higher number of patients.

We encountered a post-operative stricture formation at anastomotic site in 4(16%) patients. These patients were treated by endoscopic dilatation [1]. Orringer in his original study found a stricture rate of 20% and prescribed a liberal dilatation for these patients.

The most important aspect of esophagectomy is the completeness of surgery which results in better quality of life and enhanced survival. Overall survival can be improved by 10% by increasing the R0 resection rates (Mariette et al., 2004) [7]. We conclude that T3 and T4 patients in our study might have been benefitted from neoadjuvant therapy.

**CONCLUSION**

Esophagectomy is a major surgery with serious morbidity and mortality. Our experience has yielded favourable short term outcomes with acceptable mortality and morbidity. We expect to enhance this result in future with increasing volume at our centre, surgical expertise and proper case selection.

**Consent/Ethical Approval:**

Written informed consent was obtained from the patients for publication of this article and accompanying images. A copy of the written consent is available for review by the journal's Editor-in-chief.

**Conflict Of Interest:**

The authors declare that they have no competing interests.

**Funding:**

None.

**Author's Contributions:**

All authors approved and equally contributed to the preparation of this final manuscript.

Legends

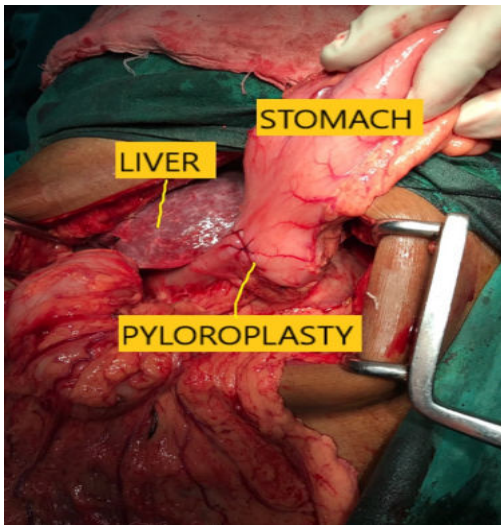


FIG 1- Intraoperative photo showing esophagus containing tumour



FIG 2- Intraoperative photo showing pyloroplasty



FIG 3- Specimen after resection

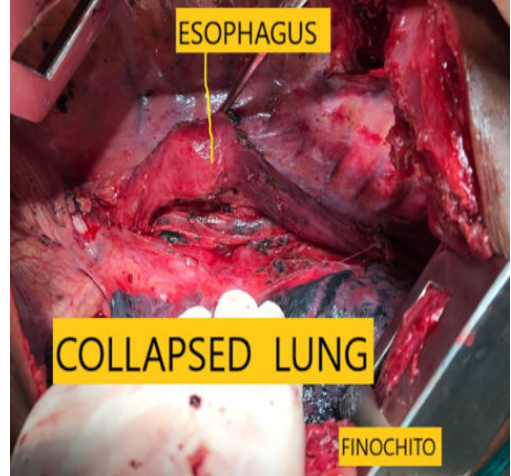


FIG 4- Gastric conduit before anastomosis

Table Legends

Table I - Demographic characteristics of patients

|                     |                                 |              |
|---------------------|---------------------------------|--------------|
| MEDIAN AGE          | Yrs                             | 58 ( 37-76 ) |
| GENDER              |                                 |              |
|                     | Male                            | 16 ( 64% )   |
|                     | Female                          | 9 ( 36% )    |
| PRESENTING SYMPTOMS |                                 |              |
|                     | Dysphagia                       | 24 ( 96% )   |
|                     | Vomitting                       | 8 ( 32% )    |
|                     | Cough                           | 4 ( 16% )    |
| PATHOLOGY           |                                 |              |
|                     | Squamous Cell Carcinoma         | 18 ( 72% )   |
|                     | Adenocarcinoma                  | 5 ( 20% )    |
|                     | Poorly Differentiated Carcinoma | 2 ( 8% )     |
| TUMOUR LOCATION     |                                 |              |
|                     | Middle third                    | 19 ( 76% )   |
|                     | Lower third                     | 6 ( 24% )    |

Table II - Details of surgery

|                                 | THE     | TTE     |
|---------------------------------|---------|---------|
| Number of patients              | 5       | 20      |
| Duration of surgery (min)       | 200-280 | 250-320 |
| Mean ICU stay (days)            | 3       | 5       |
| Mean post-operative stay (days) | 12      | 15      |
| Mean blood transfusion (units)  | 2.2     | 2.8     |
| Respiratory complications       | 1(20%)  | 11(55%) |
| Mortality                       | Nil     | Nil     |

Table III - Complications

| COMPLICATIONS   | NUMBER  |
|-----------------|---------|
| Respiratory     | 12(48%) |
| Leak            | 2(8%)   |
| Stricture       | 4(16%)  |
| Wound infection | 2(8%)   |
| RLN palsy       | 1(4%)   |
| Chyle leak      | 1(4%)   |

Table IV - Oncologic outcomes

| DEPTH OF INFILTRATION | NO. (%) | NODE -VE (%) | NODE +VE (%) | CRM -VE | CRM +VE(R 1) | R2 RESECTION (%) | R0 RESECTION (%) |
|-----------------------|---------|--------------|--------------|---------|--------------|------------------|------------------|
| T1                    | 2(8)    | 2(100)       | -            | 2(100)  | -            | -                | 100              |

|    |            |             |             |             |         |         |      |
|----|------------|-------------|-------------|-------------|---------|---------|------|
| T2 | 4<br>(16)  | 3(75)       | 1(25)       | 4(100)      | -       | -       | 100  |
| T3 | 11<br>(44) | 5<br>(45.5) | 6<br>(54.5) | 7<br>(63.6) | 4(36.4) | -       | 63.6 |
| T4 | 6<br>(24)  | 2<br>(33.3) | 4<br>(66.7) | 3(50)       | 2(33.3) | 1(16.7) | 50   |

**REFERENCES**

1. Vijayakumar M, Burrah R, Hari K, Veerendra KV, Krishnamurthy S. Esophagectomy for Cancer of the Esophagus. A Regional Cancer Centre Experience. *Indian Journal of Surgical Oncology*. 2013;4(4):332-335. doi:10.1007/s13193-013-0260-9.[PubMed] PMID: PMC3890020 . DOI : 10.1007/s13193-013-0260-9.<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3890020/>
2. Takiar R, Nadayil D, Nandakumar A (2010). Projections of number of cancer cases in India (2010-2020) by cancer groups. *Asian Pac J Cancer Prev*. 11(4):1045-1049. [PubMed]. PMID : 21133622. <https://www.ncbi.nlm.nih.gov/pubmed/21133622>
3. Omloo JM, Lagarde SM, Hulscher JB, Reitsma JB, Fockens P, van Dekken H, Ten Kate FJ, Obertop H, Tilanus HW, van Lanschot JJ (2007). 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* 246(6):992-1000. [PubMed]. PMID : 18043101. DOI: 10.1097/SLA.0b013e31815c4037. <https://www.ncbi.nlm.nih.gov/pubmed/18043101>.
4. Rindani R, Martin CJ, Cox MR (1999). Transhiatal versus Ivor-Lewis oesophagectomy: is there a difference? *Aust N Z J Surg* 69(3):187-194. [PubMed]. PMID: 10075357. <https://www.ncbi.nlm.nih.gov/pubmed/10075357>.
5. Hulscher JB, Tijssen JG, Obertop H, van Lanschot JJ (2001). Transthoracic versus transhiatal resection for carcinoma of the esophagus: a meta-analysis. *Ann Thorac Surg* 72(1):306-313. [PubMed]. PMID : 11465217. <https://www.ncbi.nlm.nih.gov/pubmed/11465217>.
6. Orringer MB, Marshall B, Iannettoni MD (2000). Eliminating the cervical esophagogastric anastomotic leak with a side-to-side stapled anastomosis. *J Thorac Cardiovasc Surg* 119(2):277-288. [PubMed]. PMID : 10649203. DOI: 10.1016/S0022-5223(00)70183-8. <https://www.ncbi.nlm.nih.gov/pubmed/10649203>.
7. Mariette C, Taillier G, Van Seuningen I, Triboulet JP (2004). Factors affecting postoperative course and survival after en bloc resection for esophageal carcinoma. *Ann Thorac Surg* 78(4):1177-1183.[PubMed]. PMID:15464466.DOI:10.1016/j.athoracsur.2004.02.068. <https://www.ncbi.nlm.nih.gov/pubmed/15464466>.