

# PERIOPERATIVE MORBIDITY AND MORTALITY IN 100 CASES OF TRANSHIATAL ESOPHAGECTOMY- A SINGLE SURGICAL UNIT EXPERIENCE OF KHYBER TEACHING HOSPITAL, PESHAWAR

Muhammad Muslim<sup>1</sup>, Muhammad Attaullah Khan<sup>2</sup>, Nisar Ahmad<sup>3</sup>, Muhammad Zarin<sup>4</sup>, Mushtaq Ahmad<sup>5</sup>, Mehmud Aurangzeb<sup>6</sup>, Saqib Saleem Afridi<sup>7</sup>

<sup>1-7</sup> Department of Surgery,  
Khyber Teaching Hospital,  
Peshawar - Pakistan.

**Address for correspondence:**  
**Muhammad Muslim**

Surgical A Unit, Khyber  
Teaching Hospital, Peshawar -  
Pakistan.

E-mail: doctormuslim@yahoo.  
com

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## ABSTRACT

**Objective:** To observe the perioperative morbidity and mortality rates of 100 transhiatal esophagectomies operated for esophageal carcinoma in a surgical unit of a tertiary care hospital.

**Methodology:** Data pertaining to all patients that had undergone transhiatal esophagectomy from Feb, 2012 to Jan, 2014 were reviewed. The study group comprised 100 patients. Indication for surgery was esophageal cancer.

**Results:** Perioperative morbidity and mortality i.e. morbidity and mortality during the first 30 days, were studied. Two patients died during the postoperative period in hospital. The anastomotic leakage rate was zero. No dysphagia was found during one month of postoperative period. Overall survival was 98% for the first 30 days of surgery.

**Conclusions:** Transhiatal esophagectomy has been common stay and a safe rather feasible procedure. Oncological therapy has its role and better results are found in centers where the procedure is frequently performed.

**Key Words:** Transhiatal esophagectomy, Esophageal cancer, Neoadjuvant therapy

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## INTRODUCTION

Treatment of esophageal carcinoma has always evolved as surgery is the inevitable but justified modality of treatment that can offer long term survival<sup>1</sup>. Esophagectomy demands a great degree of skill apart from a fit patient able to sustain the trauma from surgery. It can be done with and without having to open the thoracic cavity, that leads to higher morbidity in case of the later. Oncologically the over all benefit has largely been challenged with varying conflicts of interest. Longterm survival in case of the more lesser approach as such is the cases in this study the out come is similar to the transhiatal approach<sup>2</sup>. Results of esophagectomy are greatly influenced by institution volume<sup>3-6</sup>.

## METHODOLOGY

Approval from the ethics committee of our hospital was obtained and no conflicts of interests were declared as both procedures for esophagectomy were in practice.

A prospective database was maintained for patients undergoing transhiatal esophagectomy since February 2012. After one year the data was analyzed. The patient was informed about his/her inclusion in the study and an informed consent was obtained. The patients were admitted after a diagnosis from the outpatient department. During this period 100 patients underwent transhiatal esophagectomy. In all patients the indication for surgery was carcinoma of the esophagus.

## PREOPERATIVE ASSESSMENT

The preoperative assessment was done through clinical examination, endoscopy with biopsies and contrast enhanced computerized tomography. The patients were staged in accordance 6th American Joint Committee on Cancer as a TNM classification<sup>7</sup>. Patients without evidence of distant spread but locally advanced disease were subjected to neoadjuvant therapy<sup>8</sup>. All patients were given preoperative incentive spirometry and preoperative nutritional support to moderate and severe malnourished patients.

## **SURGICAL TECHNIQUE**

Patients were placed in supine position. Adequate neck extension using shoulder block was done. Following an upper midline incision the abdominal cavity was explored and assessed for resectability. An upper midline laparotomy incision was made and abdominal cavity explored. Esophageal hiatus widened and tumor resectability assessed per operatively. Stomach was mobilized with minimum gastric trauma with great care to preserve the right gastroepiploic arcade and use of vessel sealing energy devices away from gastroepiploic artery. Proximal duodenum was mobilized to minimize tension on stomach tube during transport to cervical region. Maintaining adequate length the remnant stomach the was transected from the esophagus was shaped into a tube using linear cutting staplers. Care was taken to over run the suture line with a running vicryl suture. A digital pyloromyotomy was performed. Stomach was transported to the cervical region using simple tubes to guide the tubularised stomach through the posterior mediastinum to the neck on left side. Digital pyloromyotomy was performed as a routine in every case. Oblique Cervical incision was made along the medial border of the sternocleidomastoid muscle and cervical esophagus was reached through careful dissection using gentle digital traction. Cervical esophagus was divided at the level of sternal notch. Esophageal mucosa was divided about 2 cm distal to muscle layer to provide enough mucosal length for anastomosis after spontaneous mucosal retraction. Esophagus was anastomosed to the apex of gastric tube about 2 cm anterior to staple line in an end to end fashion with hand sewn interrupted 2/0 Vicryl suture. The already in place nasogastric tube was advanced so that the eyes of the tube lay beyond the anastomosis providing adequate gastric decompression in the postoperative period. Drain in inferior mediastinum with multiple pores for stomach bed drainage and a witzel jejunostomy for later postoperative nutrition was also performed.

## **POSTOPERATIVE MANAGEMENT AND OUTCOME ASSESSMENT**

Patients were kept in ICU in postoperative period for vitals monitoring and ventilator support if needed. Patients were allowed on incremental basis on the second post-operative day with clear liquids after removal of the nasogastric tube. They were started on incentive spirometry and TED stocking were routinely used for DVT prophylaxis. Gradual increments on oral diet was adjusted accordingly with the ongoing nutritional requirements that was initially parenteral and through the feeding jejunostomy. Patients were discharged when they were able to tolerate oral feeding with adequate caloric intake. The feeding jejunostomy was removed after six weeks. During this period patients were advised to feed through both oral and enteral route. Date

of post operative morbidity was documented and later analyzed which included injury to the recurrent laryngeal nerve, chylothorax, anastomotic leak, and thoracic complications such as empyema. Non surgical complications were also documented.

## **RESULTS**

From Feb 3, 2012 to Jan 31, 2014 total 100 patients were operated for carcinoma esophagus. Sixty seven patients were male and thirty three females. All these patients underwent THE. Mean age was 55 years. Adenocarcinoma was found in 61% and Squamous cell carcinoma in 39%. Eighty two patients were belonging to Afghanistan. Seven patients were from FATA (North-Western tribal areas of Pakistan) and the rest were from the Khyber Pukhtunkhwa province of Pakistan. Only four patients presented with Stage I disease that was referred by gastroenterologist after endoscopy and biopsy for long standing Barrett's Esophagus. Twenty two patients presented with Stage IIa and twenty nine patients presented with Stage IIb. Forty five patients presented with Stage III disease of which fifteen patients were render operable with neoadjuvant therapy by down staging their tumors. Upper third tumors, defined as those extending from the thoracic inlet to the level of the carina, or from approximately 19 cm to 25 cm from the upper incisors at endoscopy, were found in two patients. These two patients had their tumor just at the level of carina with most of the tumor bulk located proximal to the level of carina. Middle third tumors i.e. involving the esophagus from the level of the carina to a point approximately 5 cm above the esophagogastric junction, roughly 25-35 cm from the incisors, were found in thirty two patients and distal third tumors, involving the esophagus from 35 to 40 cm from the incisors, were found in sixty six patients. Lymph nodes harvested were 14-35 lymph nodes. Tumor free resection margins were obtained in 93 cases. No intra-operative complications were encountered. Estimated blood loss was much less, about 320ml per case due to use of Harmonic device. Postoperative ICU stay was from 3-8 days with mean ICU stay of 5 and half day. Three patients needed mechanical ventilation from 24 to 72 hours. No patient developed anastomosis leak, mediastinitis or left recurrent laryngeal nerve palsy. Respiratory problems developed in eleven patients in the form of atelectasis, pleural effusion, pneumothorax or pneumonia. One patient died because of postoperative ventilator associated pneumonia and other died due to aspiration of gastric contents. Eight patients contracted surgical site infection, of which four patients had laparotomy incision infection, two patients developed cervical wound infection, and two patients got infection of both laparotomy and cervical incisions. All of them safely recovered with meticulous wound care and antibiotics.

## DISCUSSION

Different surgical approaches have been practiced for esophagectomy keeping in view the anatomical location of tumor and extent of disease. Conventionally, a transthoracic esophagectomy (TTE) have been practiced for esophageal cancers of middle and upper esophagus and a transhiatal esophagectomy (THE) performed for cases where the mass is low and accessible through the hiatus.

A 2001 meta-analysis of a large number of cases over a span of ten years and including several studies on the topic were evaluated revealing response with those undergoing transhiatal esophagectomy<sup>9</sup>. However, operating time was comparatively lower for THE than TTE<sup>10, 15-16</sup>. We didn't encounter any anastomotic leak, mediastinitis, recurrent laryngeal nerve injury or chylothorax, that may be because of very high number of cases i.e. about 50 cases per annum operated in our unit, the expertise of surgical team including very experienced general and thoracic surgeons, refined surgical technique employed, preoperative nutritional build up, preoperative smoking cessation and dedicated postoperative care. Stomach mobilization with minimum trauma, careful preservation of right gastroepiploic arcade<sup>9</sup>, kocherization of proximal duodenum, creating ample mediastinal tunnel<sup>9</sup>, dividing proximal esophagus at sternal notch level and dividing esophageal mucosa about 2 cm distal to the division of esophageal muscles were the key factors to obtain a tension free anastomosis.

High volume center, Surgeons expertise and surgical techniques employed were the factors that influenced the anastomotic leak rate. We didn't observe any case with empyema, pleural effusion, pneumothorax and mediastinitis. Surgical technique<sup>12</sup>, routine use of bilateral chest drains and mediastinal drain prevent any collection in these areas. Careful dissection in cervical region, dissection in correct tissue planes, and avoidance of using retractors prevent injury to recurrent laryngeal nerve<sup>18</sup>.

Obtaining tumor free resection margins is the main conflict while doing a THE. However in only 7 patients we didn't get a tumor free resection margins, the highest failure was in upper mediastinal tumor resection where one of the two patients had proximal resection margins involved. In tumors of middle esophagus, 2 patients out of 32 had tumor resection margins involved by tumor and in 4 patients with tumor in lower esophagus tumor free resection margins were not obtained. Circumferential resection margins were involved in 4 patients. We are of the opinion that upper third esophageal tumors should not be resected with a THE<sup>19</sup>, the two of our patients had a borderline upper third esophageal tumors that were resected with THE. Neoadjuvant

therapy was given to 21 patients, of which 11 patients get their tumor down staged and they were included in this study group.

Some controversy on the part of the minority who believe that an aggressive mediastinal lymphadenectomy is an important aspect of the surgical treatment of esophageal cancer still engenders the appropriateness of THE in patients with carcinoma<sup>20</sup>. The lymph node dissection for our patients with cancer treated with THE remained comparable with those reported after transthoracic esophagectomy. After having a great experience in operating carcinoma esophagus patients for long time and institutionally mastering the THE, we think that a comparable oncological resection is possible through THE in carcinoma esophagus patients, while avoiding the morbidity of TTE. The number of lymph nodes harvested were, 16 to 47 and micro metastasis were found in 2-16 lymph nodes in 88 patients.

We are assessing these patients from time to time and will review our paper after sometime to know about the tumor recurrence, anastomotic stricture, survival benefit in these patients.

One of the main issues is the demographic of carcinoma esophagus in our set up, the adenocarcinoma is on rise as the global trend is, but the geographical distribution is really worrisome. Eighty percent of the patients were from Afghanistan and 7% were from FATA, the tribal belt of Pakistan that is adjacent to Afghanistan. Excessive use of hot green tea (hot beverages), snuff addiction and drinking springs water may be predisposing factors in Afghans<sup>21</sup>, however our observation is that the prevailing war and use of weapons of mass destruction in Afghanistan for long time has some association with increase in incidence of carcinomas in Afghan nation, as not only carcinoma esophagus but almost every type of cancer is on rise in the people of Afghanistan, specially, Upper GI tumors, soft tissue sarcomas, brain tumors and urinary tract cancers.

## CONCLUSION

Transhiatal esophagectomy has been common stay and a safe rather feasible procedure. Oncological therapy has its role and better results are found in centers where the procedure is frequently performed. Esophageal cancer is a deadly disease however surgery can provide survival benefits if done in early stages and later on surgery is the best palliation as well. Based on our experience of decreased perioperative mortality and morbidity, oncological resection margins clearance and number of harvested lymph nodes comparable to TTE, we advocate a transhiatal approach for tumors of middle and lower third of esophagus if done in a high volume center with expert oncological surgery team.

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## CONTRIBUTORS

MM and MAK participated in planning of study, data analysis and manuscript writing. MA supervised the study and helped in manuscript writing. NA, MZ and MA helped in data management. All authors contributed significantly to the final manuscript.