

TRANSHIATAL ESOPHAGECTOMY: A PREFERRED PROCEDURE IN STAGE III DISEASE OF LOWER END OF ESOPHAGUS

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ABSTRACT

Objectives: To review the postoperative relief of dysphagia and reduced peri operative morbidity and mortality in patients who underwent Trans Hiatal Esophagectomy (THE) in stage III disease of the lower end of esophagus.

Material and Methods: A retrospective study was conducted to review the postoperative relief of dysphagia and peri operative morbidity and mortality in post Trans Hiatal Esophagectomy patients with stage III disease of the lower end of esophagus. The record of all the patients who underwent Trans Hiatal Esophagectomy during the period from Feb, 2012 to Jan, 2015 was reviewed. Among them, the patients with clinical and radiological stage III disease were selected for the study. A total of 120 patients underwent THE during this period. Seventy patients among them had stage III disease.

Results: We retrospectively studied the relief of dysphagia and morbidity / mortality during the first 30 days of Trans Hiatal Esophagectomy. Two patients died during the postoperative period in hospital. Three (4.28%) patients had clinically evident anastomotic leak from the cervical wound. No significant dysphagia was noted in first 30 days post op period. Patients were able to eat and drink after one month of their surgery. The numbers of lymph nodes removed during surgery were 9 to 22 with an average of 15 per patient.

Conclusion: It is a relatively safe procedure with lower morbidity and mortality in patients with stage III disease of the lower end of esophagus with a good yield of lymph nodes if performed by experienced surgeons in a high volume centre.

Key Words: Trans Hiatal Esophagectomy, Esophageal cancer, Dysphagia, Anastomotic leak, Morbidity.

INTRODUCTION

Surgery is the treatment of choice in carcinoma esophagus¹ in both early and locally advanced disease². The time of presentation and stage of the disease influence the choice of the treatment modality. There are also controversies regarding peri esophageal lymphadenectomy³. For the treatment of lower end esophageal cancers, Trans Hiatal approach is a preferred option⁴. The other approaches are thoraco-abdominal and transthoracic approaches for middle and supra carinal tumors⁵. Esophagectomy is a major plus procedure with its accepted morbidity and mortality. However, the results are greatly influenced when the procedures are done in high volume centres⁶⁻⁸.

The aim of the study was to review the results of Trans Hiatal Esophagectomy in stage III disease of lower end of esophagus performed in a single surgical unit.

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MATERIAL AND METHODS

This study was conducted in Surgical Department of Khyber Teaching Hospital, Peshawar from February, 2012 to January, 2015. During this period we performed 120 trans hiatal esophagectomies. Among them, 70 patients had stage III disease of the lower end of esophagus.

All the patients were pre operatively assessed through history, clinical examination, endoscopy with biopsy and CT scan of the chest and upper abdomen with oral and i.v contrast. It was staged according to the 6th American Joint Committee on Cancer/ International Union against cancer (AJCC/UICC) TNM classification⁹. The patients with locally advanced disease (defined as T4 and N1/ N2 disease) were referred to oncologist for neo adjuvant therapy to down stage the tumor¹⁰. Pre operative optimization was done with incentive spirometry, smoking cessation, nutritional support, antibiotics and DVT prophylaxis.

Patients were put supine on operation table. A supportive pillow was used behind the lower chest and another between the scapulae to make hiatus and the left side neck prominent. Head was supported on a head ring facing slightly towards the right. Foley's

catheter and nasogastric tube were placed on induction. Central venous line was also placed. The patient's abdomen, chest and neck were prepped and draped. The operation was started with an upper mid line laparotomy incision to explore the abdomen first. Possibility of hepatic or other visceral and lymph node metastasis were assessed. The esophageal hiatus was opened. A vertical incision was made at 12O'clock position to widen the hiatus. Resectibility of the tumor was assessed. Tumor and the esophagus were mobilized through the hiatus by blunt finger dissection. Hiatus was retracted with help of two small deaver retractors to mobilize the tumor under vision for up to retro cardiac area. The rest of the esophageal mobilization was done blindly using the nasogastric tube as a guide. The stomach was mobilized carefully on the right gastro-epiploic artery as a feeding vessel. Stomach tube was made to be able to reach up to cervical region for gastro esophageal anastomosis. We did not perform gastric drainage procedure, but instead, performed a digital pyloro-myotomy to widen the pylorus so that the vertical stomach tube should empty easily. The uppermost thoracic and cervical esophagus was mobilized from the left neck. An incision was made along the anterior border of sternomastoid muscle to reach the cervical esophagus through the space between the carotid sheath laterally and thyroid gland medially. The middle thyroid vein and inferior thyroid artery were ligated when needed. The cervical esophagus was transected in the mid cervical region. Mucosa was transected 1 cm distal to the seromuscular layer to avoid discrepancy after mucosal retraction. A meticulous mucosa to mucosa gastro-esophageal anastomosis was performed at mid cervical level with 2/0 vicryl interrupted suturing. At the end, the transposed stomach wall was anchored to the deep surface of the sternomastoid muscle to avoid tension on the anastomosis. Feeding jejunostomy was performed routinely for postoperative enteral feeding.

Postoperatively, all the patients were kept in ICU for post op care. Jejunostomy feeding was initiated on post op day 2 with daily incremental increase up to 150 ml/ hour in 3 to 4 days. The nasogastric tube was removed on 7th post op day. Patients were allowed oral sips on 8th post op day. The patients were sent home when they were able to tolerate oral feeding. The feeding jejunostomy remained in situ for up to 4 to 6 weeks until started on chemotherapy by the oncologist. Data regarding major post op complications including difficulty in swallowing was collected. All patients were referred to oncologist for post op chemo/ radio therapy after detailed histopathological report was received.

RESULTS

Seven patients were operated via McKeown approach and 120 were operated through trans-hiatal approach. Of the 120 patients who underwent Trans Hiatal Esophagectomy, 70 patients had stage III disease of the lower end of esophagus. These patients were selected for the study. Fifty (71.4%) patients belonged to Afghanistan, 7(10%) were from tribal areas of Pakistan and the remaining (18.6%) were from the other areas of Khyber Pakhtunkhwa province. Patients characteristics are shown in Table.

Among these patients with stage III disease, 15(21.4%) patients were rendered operable after neo adjuvant chemotherapy down staged their tumors. Tumor free resection margin were obtained in 53(75.7%) patients. Thirteen (18.5%) patients had circumferential resection margins involved. Three (4.2%) had distal resection margin involvement and one had the proximal margin involved. The total number of lymph nodes removed were from 9 to 22 (15 ± 6) per case. No major intra operative complication was encountered. Estimated blood loss was less than 300 ml per case. Post op ICU stay was 4 to 7 days with mean ICU stay of 5.2 days. Three (4.2%) patients developed anastomotic leakage. One patient had a major leakage and developed mediastinitis who died of sepsis on 11th post op day. The other two had minor leakage at the cervical wound who responded well to conservative treatment with prolonged NPO (nil per oral), daily dressing of the wound and feeding jejunostomy for more than 2 weeks. Three (4.2%) patients needed mechanical ventilation for 24 to 72 hours. Minor respiratory problems developed in 22(31.4%) patients. Majority of them had atelectasis, which responded well to deep breathing, coughing, incentive spirometry and chest physiotherapy. A few had pleural effusion, pneumothorax or pneumonia. All were treated accordingly. One patient died of post op ventilator related respiratory complication and another died of massive anastomotic leakage and mediastinitis. Six (8.5%) patients developed surgical site infection, of which 4 (5.7%) patients had laparotomy wound infection and 2 (2.8%) had infection of the neck wound. All of them were treated conservatively with regular dressings and antibiotics.

DISCUSSION

The treatment of carcinoma esophagus requires a multidisciplinary team approach including physician, surgeon, oncologist and physiotherapist. Surgery is the best treatment for early stage as well as locally advanced disease^{1,2}. Lymph node dissection and lymphadenectomy of different levels has been the subject of

Table 1: Patient's characteristics

No.	M/F	Age (mean)	Squamous cell Carcinoma	Adenocarcinoma	No. of harvested lymph nodes
70	43/27	62	24	46	15 ± 6

debate³. Different surgical options have been practiced by different surgeons keeping in view the anatomical location of the tumor and location and extent of lymph node dissection. Transthoracic approach is used for supra carinal tumors while Trans Hiatal approach for tumors of the lower end esophagus and gastro esophageal junction.

A 2001 Meta analysis of 7527 patients undergoing either trans hiatal or transthoracic approaches for carcinoma esophagus in 1990 to 1999 documented statistically significant difference favoring transhiatal over transthoracic approach in hospital morbidity, blood loss, pulmonary complication, chylothorax, ICU stay and hospital stay. The transthoracic approach had lower anastomotic leak rates than trans hiatal approach. It had lower vocal cord paralysis and increased yield of harvested lymph nodes than trans hiatal group¹¹. However, operating time was comparatively lower for transthoracic group¹². Institutional outcome of the procedure had been shown to be surgeon's experience and volume dependent¹³, with 9.4% difference of adjusted mortality between low volume centre (2 to 4 esophagectomies per year 17.8% mortality) and high volume centre (+19 esophagectomies per year 8.4% mortality)^{14,15}. The peri operative mortality was very low in our centre (2.85%). Anastomotic leakage is considered the most common major complication after Trans Hiatal Esophagectomy with leakage rate of up to 13%¹⁶. Several factors may contribute to the development of anastomotic leak but technical error and gastric tip ischemia is considered to be the most important^{17,18}. In our study, only 3(4.2%) patients had anastomotic leak. Two of them responded well to conservative treatment with nil per oral (NPO), care of the wound and feeding jejunostomy. They were able to take oral feed after 3 weeks post op. The 3rd patient with leak developed severe mediastinitis and died of severe sepsis on 11th post op day. Recurrent laryngeal nerve injury and chylothorax were not observed in our study. The dictum "pink in the abdomen" after complete gastric mobilization and, "pink in the neck" after transposing the mobilized stomach through the posterior mediastinum and delivering the fundus into the cervical wound, was the guiding principal¹⁹. Stomach mobilized with minimal trauma, careful preservation of right gastro epiploic arcade²⁰ using haemostatic and cutting devices well away from it, creating ample mediastinal tunnel²¹, kockerising the duodenum and bringing the pylorus near the hiatus as much as possible and meticulous mucosa to mucosa gastro esophageal anastomosis in the neck with interrupted vicryl 2/0 suture were the key factors to obtain tension free anastomosis and reduced anastomotic leak rates. Apart from this, digital pyloro-myotomy and retaining the nasogastric tube within the body of the stomach in the chest also contributed well in keeping the stomach empty and thus reducing the tension on the anastomosis. Thus surgeon experience and refinement in

surgical techniques due to high volume of transhiatal esophagectomies have reduced the historic morbidity and mortality of esophageal resection²².

Routine use of feeding jejunostomy has also enabled us to keep the patients nutritionally up to the mark. We were able to keep the patients nil by mouth (NPO) for a longer time if any leakage was suspected. It also helped us to avoid expensive parenteral nutrition. In terms of lymph adenectomy, transthoracic approach is considered superior to trans hiatal approach²³. The numbers of lymph nodes harvested in our unit were 9 to 22 (15±6). However, decreased post operative morbidity in trans hiatal patients as compared to transthoracic patients and its appropriateness for lower end esophagus tumors with comparable lymph nodes yield validates its practice.

CONCLUSION

This procedure is relatively safe with lower morbidity and mortality in patients with stage III disease of the lower end of the esophagus.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

- Muslim M:** Study conception and design.
Ahmad M: Acquisition of data.
Ahmad N: Analysis and interpretation of data.
Waheed R: Bibliography.
Aurangzeb M: Critical revision.
Khan MA: Drafting of manuscript.
Afridi SS: Statistical expertise.
Khan ZM: Followup.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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