

The Out Come of Stomach Pull Up in the Benign and Malignant Diseases of the Esophagus

M S ARSHAD A J BOKHARI A KHANUM A R BHUTTA M TUFAIL . K J ABID

Department of Surgery, Fatima Jinnah Medical College/Sir Ganga Ram Hospital Hospital, Lahore
Correspondence to Dr. Muhammad Saleem Arshad

The objective of the study was to assess the outcome of stomach pull up in benign and malignant diseases of esophagus. This study was conducted between January 1998 to January 2001, at Shaikh Zayed Hospital and Sir Ganga Ram Hospital, Lahore to evaluate the results of "Stomach pull-up" in benign and malignant diseases of esophagus. This study included twenty-five patients both males and females of different ages. Seven patients formed the benign group and eighteen patients in malignant group. Barium studies, gastroscopy and biopsy and C.T scan were important investigation other than the routine ones. We followed Orringer's technique in most cases of "Stomach Pull-up. Results of study were encouraging. The incidence of pneumothorax was 40% and anastomotic leak was 30% and mortality rate of 10% which were comparable to those reported in literature. We optimistically conclude from this study that stomach "pull up" is a safe and simple procedure and we recommend it as a curative and palliative procedure for benign and malignant diseases of esophagus.

Key word: Stomach pull up

Benign esophageal disease like corrosive strictures, perforations and benign tumours as well as malignant lesions of the esophagus require esophageal replacement to achieve symptomatic relief. At the present time there is no suitable manufactured prosthesis which can replace and function in place of the resected esophagus, therefore, reconstruction of the alimentary tract is limited to the use of an autotransplant of a tubular organ with its vascular pedicle. The stomach, jejunum or colon satisfy the requirements and are used as an oesophageal substitute¹.

The stomach has always been favoured for oesophageal replacement. Its rich communicating blood vessels and presence of a long vascular pedicle along its greater curvature makes the stomach an organ of choice for the reconstruction. It is not used in cases of earlier gastric surgery or has benign or malignant disease or has its mobility limited by the disease².

Evidence suggests that the best organ to replace the esophagus is the stomach and that the posterior mediastinal route is the ideal route of replacement³. Stomach tube functions well as an oesophageal substitute in all patients who survived surgery. They had normal swallowing restored⁴. The perfusion of the extended gastric tube proves satisfactory even in cases which have no visible continuity of vascular arcade, owing to the many intramural anastomosis of blood vessels of the greater curvature of the stomach⁵. Operative time for gastric transposition is less as compared to colon / jejunal placement⁶. Gastric transposition is simpler, safer and quicker than when isolated segments of small and large intestines are used⁷.

The aims and objectives of the studies are:-

- To study the efficacy of use of stomach as a conduit in benign or malignant diseases of the esophagus.
- To evaluate the mortality and morbidity of the stomach "Pull-up" procedure for esophageal

replacement in benign and malignant disease of the esophagus.

Material and methods:

Between January 1998 and January 2001. Twenty five patients suffering from benign and malignant diseases of esophagus underwent the stomach "pull up" procedure via the transhiatal or transthoracic esophagectomy. Stomach was used as a visceral substitute for the esophagus. Out of twenty-five patients, seven were operated for benign esophageal disease (corrosive stricture) and eighteen for malignant esophageal disease. The patients included in the study were those which were biopsy proven cases of carcinoma of esophagus and esophageal strictures with failed endoscopic dilatation or too frequent dilatation in younger patients. The patients who had already diseased stomach or previous gastric surgery were excluded in this study. Diagnosis was made in all cases by endoscopy with endoscopic biopsy, contrast radiography with barium meal/swallow, CT-scan chest and abdomen and ultrasonography. Patients with mid esophageal tumor underwent bronchoscopy to assess possible tracheobronchial invasion.

Patients were placed in either supine position with extended neck or left/right lateral thoracotomy position depending upon the procedure to be undertaken. After initial laparotomy through upper mid line incision, the stomach was mobilized based on right gastric and right gastroepiploic artery. Lower esophages mobilized by transhiatal blunt dissection. Remaining part of thoracic esophages was mobilized either by doing a right/left throacotomy (transthoracic approach) or by the transhiatal approach. The cervical esophagus was approached by either a right transverse cervical incision or a left oblique cervical incision. A single layer anastomosis was accomplished between the cervical esophages/pharynx and the stomach with interrupted 2/0 vicryl. A pyloromyotomy

was done in all case of stomach pull-up. A feeding jejunostomy was done in all the patients.

Results:

The malignant group consisted of eighteen patients who underwent either transhiatal or transthoracic esophagectomy utilizing stomach "pull-up" for reconstruction. Out of the included eighteen patients, thirteen were males and five were females. The mean age of the group was 45 years (range 40-60 years). Progressive dysphagia ranging from grade III to grade IV was the presenting symptom. Duration of dysphagia ranged from three to five months (mean 3 months) (Table 1). Benign group consisted of seven patients of corrosive esophageal strictures. These patients had undergone repeated sessions of dilatation ranging from 4 months to one year in different gastroenterology units. They were two male and five females. Mean age of patients was 30 years (15-50 years). Duration of dysphagia ranged from one to three months and was predominantly grade IV dysphagia (Table 2).

Table-1. Malignant group

Total No. of patients	18
Mean age	50 years (40-65 years)
Predominant complaint	Dysphagia (Grade-III)
Duration	3-7 months
Weight loss	> 20% (100% cases)
Tumor level	Lower esophagus 54% Mid esophagus 33% Cervical esophagus 13.3%
Approach of stomach pull-up	Transhiatal (Pn = 15) Transthoracic (Pn=3)
Retrosternal stomach pull-up	Pn=5
Posterior mediastinal stomach pull-up	Pn=13

Table-2. Benign group

Total No. of patients	07 (M 2, F5)
Mean age	30 years (15-50)
Predominant complaint	Dysphagia (Grade IV)
Duration	2-3 months
Weight loss	>20% (100% cases)
Stricture level	Cervical esophagus 70% Thoracic esophagus 70% Lower esophagus 15%
Approach of stomach pull-up	Transhiatal (Pn=5) Transthoracic (Pn=2)

Table-3. Postoperative complications

Incidence of postoperative complications	Malignant group (n=18)	Benign group (n=7)	Combined Results (n=25)
Pneumothorax	44.4%(n=8)	42.8%(n=3)	44%(n=11)
Anastomotic leak	27.7%(n=5)	28.5%(n=2)	28% (n=7)
Anastomotic stricture/recurrence	5%(n=1)	28.5%(n=2)	12% (n=3)
Mortality	11.1%(n=2)	14.0%(n=1)	12%(n=3)

There were no intraoperative deaths. However, in the malignant group two patients died after surgery giving a mortality of 11.11%. One patient died from complication of a leaking anastomosis and infected cervical wound. Other patient died from Empyema thoracic. In the benign group, one death occurred from empyema thoracic also. Thus the mortality figure in both the groups combined comes out to be (3/25) is 12%.

Patients of both groups were followed for one year at 3 monthly intervals but patients compliance for follow-up was not encouraging. There was significant weight gain in benign group compared to malignant group. Two patients from benign and one patient of malignant group developed stricture at anastomotic sites and were treated by repeated endoscopic dilatations.

Discussion:

This study was conducted with a small number of patients in a small time frame, yet it provides encouraging results supporting the stomach pull-up procedure for benign and malignant diseases of the oesophagus.

The proponents of "stomach pull-up" [via transthoracic approach put forward the idea of potential for radical clearance of the tumor and local nodes en block, through this approach⁸. But this is controversial as Sannohe has shown that squamous cell carcinoma spreads to supraclavicular and coelic lymph nodes without overt metastasis in the chest. This renders en block resection impossible for squamous cell carcinoma. Stomach pull-up through a thoraco-abdominal approach in debilitated and elderly patients has led to disastrous results of disruption of an intrathoracic anastomosis⁹.

The stomach "pull-up" via transhiatal approach avoids thoracotomy and with cervical esophagogastric or pharyngogastric anastomosis, sepsis, resulting from leak of intrathoracic anastomosis is avoided¹⁰.

Literature reports a correlation between anastomotic leak and high incidence of fibrous stricture formation (upto 45%)⁽¹¹⁾. Anastomotic leak is a common problem, despite the advances that have taken place in the overall diagnosis and treatment of esophageal diseases, there inevitably remains a small group of patients who develop leakage after esophageal anastomosis. It usually manifests by 2nd to 3rd postoperative day¹².

Many factors contribute to anastomotic leak such as poor surgical technique, chances of a leak increase with double layer anastomosis compared to single layer anastomosis¹³, a low pre-op serum albumin level and high intraoperative blood loss¹¹. Akiyama et al have reported mortality rate of 1.4% and leak rate of 5.2%, while Hung et al reported mortality 4.1% and leak rates 4.5%¹⁴.

In our study pleural tears were common and we had to resort to chest intubation but this complication was well managed without any significant problem. There are surgeons who routinely use bilateral chest intubation in all of their cases¹⁵. Influence of preoperative nutritional status

on postoperative course has been over emphasized in literature¹⁶. Enteral feedings parallel parenteral alimentation if supplemental preoperative nutrition is given¹⁷.

Post operative benign esophageal strictures at the cervical anastomosis commonly occur and are an important source of morbidity. This complication has been reported to occur in 12-40% of cases after cervical esophagogastrectomy using gastric pull up or gastric tube¹¹. Factors leading to stricture formation are anastomotic leak¹⁸, compromised vascularity of the esophageal substitute especially in the gastric tube operation leading to stricture formation¹⁹. Graffin and associates at prince of Walf Hospital, Hong Kong have reported 91% success rate with dilatation²⁰.

The low operative mortality and morbidity combined with satisfactory late functional and nutritional results indicate that stomach pull-up is a safe procedure for both benign and malignant diseases of the esophagus.

References:

- Moghissi K. General techniques related to operations on the esophagus. In: Essentials of thoracic and cardiac surgery by Moghissi K. 2nd edition. William Heinemann Medical Books, London 1986; p 296-97.
- Holscher AH, Siewert AR. Use of stomach as an oesophageal substitute. In: Surgery of the upper gastrointestinal tract by Jamieson GG, Debas HT. 5th edition. Chapman & Hall Medical, London. 1986; 153.
- Hashmi H, Sabaratnam F, Sabanathant G. Transhiatal esophagectomy in the management of cancer of thoracic esophagus. JR Coll Edin Surg 1989; 39: 192-94.
- Marmuse M, Koka F, Guedon L. Surgical treatment of carcinoma of proximal oesophagus. Am J Surg 1995; 169: 386-101.
- Putnam JB, Roth JA. Neoplasm of the esophagus. In: Digestive tract surgery by Bell RH, Rikkers LF, Mulholland MW. Lippincot Raven Publisheres city. 1996; 55.
- Gavriliu D. The replacement of esophagus by a gastric tube. In: Surgery of the esophagus by Jamieson GG. Churchill Livingstone, Edinburgh. 1988; 765-70.
- Shackelford RT. Methods of reconstructions of esophageal defects of by passing esophageal obstruction by use of some portion of alimentary tract. In: Surgery of the alimentary tract. 2nd edition. WB Saunders Company, Philadelphia. 845.
- Sannohe Y. Lymph node metastasis in cancer of cervical esophagus. Am J Surg 1981; 141: 216-18.
- Orringer MB. Substernal gastric bypass of the oesophagus. In: Surgery of the esophagus by Jamieson GG (ed). Churchill Livingstone, Edinburgh. 1988; 739-42.
- Orringer MB. Transhiatal esophagectomy without thoracotomy. Adv Surg 1986; 19: 1-4.
- Leith-Dewar, Gelfand S and Finley J. Factors affecting cervical anastomotic leak and stricture formation following esophagogastrectomy and gastric tube interposition. Am J Surg 1992; 163: 484-90.
- Polk HC, Richardson FD. Anastomotic leakage. Management of the complications of surgery on the esophagus. In: Surgery of the esophagus by Jamieson GG. 1st Ed. 1988; 871-73.
- Zieren HU, Muller JM. Prospective randomized study of one or two layer anastomosis following esophageal resection and cervical esophagogastrectomy. Br. J Surg 1993; 80: 602-11.
- Paterson IM, Wong J. Anastomotic leakage: an avoidable complication of Lewis-Tanner Oesophagectomy. Br J Surg 1989; 76: 127-29.
- Curren AJ, Gouch DB, Murchoearla FD. Transhiatal esophagectomy in management of advance esophageal carcinoma. JR Coll Surg Edinburgh 1992; 37: 225-26.
- Fekete F, Belghi TI. Nutritional factors and esophageal resection. In: Surgery of the esophagus by Jamieson GG (ed). Churchill Livingstone, Edinburgh. 1988; 119-24.
- Putnam JB, Roth JA. Neoplasm of the esophagus. In: Digestive tract surgery by Bell RH, Rikkers LF, Mulholland MW. Lippincot. Raven Publishers. 1996; p 51-56.
- Pierie JP, DeGraff PW, Poen H. Incidence and management of benign anastomotic stricture after cervical esophagogastrectomy. Br J Surg 1993; 80: 471-73.
- Snell RS. Gastrointestinal tract (Stomach). In: Clinical anatomy for medical students, 4th edition. Little, Brown and Company Boston. 1992; 223-24.
- Griffin SM, Woods SDS, Chan A. Complications of subtotal esophagectomy for squamous carcinoma of the esophagus, JR Coll Surg Edinb 1999; 3: 178-80