ORIGINAL ARTICLE

# OUTCOME ANALYSIS OF TOTAL LARYNGOPHARYNGEAL OESOPHAGECTOMY IN CARCINOMA HYPO-PHARYNX AND CERVICAL ESOPHAGUS, WITH STOMACH RECONSTRUCTION

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**Background:** Upper cervical oesophageal and hypo-pharyngeal malignancies pose significant challenges in surgical management. In advanced tumours total laryngopharyngeal esophagectomy (TLPO) and gastric pull up provides excellent result. **Methods:** It is a descriptive case series and was conducted from Jan 2010 to Jan 2017. Thirty-five patients underwent TLPO. The inclusion criteria were; tumours of hypo-pharynx which allow tumour free resection margins and cervical oesophageal tumours not involving mediastinal trachea. There were no clinically palpable cervical lymph nodes. Patients with locoregional advanced disease and poor performance status were excluded. All cases underwent standard one stage TLPO with bilateral inter-jugular lymph nodal clearance. Minimal invasive techniques used in three cases. **Results:** Out of 35 patients, n=21 (60%) of patient had lesion of hypopharynx with post cricoid involvement, n=13 (37.1%) had primary tumour of cervical oesophagus abutting pharynx and cricoid and only one patient had a tumour of hypopharynx with perforation. Histopathological conformation of diagnosis done in all patients preoperatively which showed Well differentiated Squamous cell in n=19 (54.28%), moderately differentiated squamous cell in 28.57% (n=10). Post-operative staging of the patients 74.28% (n=26) fall in stage 3. Operative time was less than 3 hours in 17 patients with two team technique, between 3–4 hours in 8 patients and more than 4 hours in 3 patients. SVT in 14.28% (n=5), Atrial Fibrillation in 5.71% (n=2). Chest complications including pneumothorax in 11.43% (n=4), basal atelectasis in 22.86% (n=8), pulmonary embolism in 2.85% (n=1), aspiration in 8.57% (n=3) and tracheal stenosis in n=1, 5.71% (n=2) cases had anastomotic leak. Postop 28 days mortality was 8.57% (n=3). **Conclusion:** TLPO with stomach pull up offer good results in patients with resectable disease with acceptable morbidity and mortality in operable patients.

**Keywords:** Carcinoma hypopharynx; Carcinoma oesophagus, Cervical oesophagus, Laryngopharyngeal esophagectomy

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## INTRODUCTION

The management of hypopharyngeal and cervical oesophageal carcinoma remains one of the most challenging and controversial areas in head and neck oncology. Tumours of cervical oesophagus and hypopharynx usually present at advanced stage with high rates of regional and distant metastasis due to rich lymphatic drainage and absence of symptoms in initial stages.[1,2] Such tumours predominantly occur in people of advanced stage (55–70 years) with more chances of having comorbidities like hypertension, diabetes and chronic obstructive airway disease.

Treatment of such patients is still considered to be associated with risk of major complications and in hospital deaths. Tumours of these areas have poorest survival rates of all squamous cell cancers of upper aero-digestive track. Overall 5 years survival rate rarely exceeds 35% regardless of the treatment approach used. The potential effects of treatment on speech and swallowing are of foremost concern for the patients and their counsellors. Therefore, the aim in such cases should be to provide single modality treatment where possible, with multi-modality treatment reserved only for patients where additive survival benefit can be achieved. However, the approach in such cases should be decided according to patient's age, characteristics of tumour, clinical experience and availability of multi-disciplinary team, surgical team and advanced life support units.[3,4]

In advanced post cricoid and cervical oesophageal tumours, TLPO along with gastric pull up provides excellent result and therefore considered as first choice in most of the patients. In majority of the centres with extensive experience the mortality rate is reduced, with an

average complication and mortality rate of 37% and 16% respectively.[5]

## MATERIAL AND METHODS

This is a retrospective descriptive case series study carried out at Combined Military Hospital Rawalpindi and Combined Military Hospital Lahore over a period of 7 years from January 2010 to January 2017.This review was undertaken as a quality improvement program, and this time period was selected because of the stringent, high-quality rules for data registry maintenance and annual based audit. The clinical data reviewed included age, gender, site of growth, pre and postoperative stage, operative techniques, duration of surgery, post-operative complication, duration of follow up and mortality. Anonymity of all patients was ensured by removing their identification numbers and names.

A total of 35 patients having carcinoma hypopharynx, tumours of cervical oesophagus abutting pharynx or cricoid and tumours of hypopharynx which presented with perforation were included. All cases were treated surgically in one stage procedure by total laryngo-pharyngo esophagectomy with gastric pull up. The inclusion criteria were; tumours of hypo-pharynx not involving pharynx, very high enough clinically and radiologically, to allow tumour free resection margins and tension free anastomosis, cervical tumours sparing mediastinal trachea so that adequate tracheostomy margin should be achieved. All the tumours were clinically mobile on posterior pharyngeal wall with no clinical and radiological evidence of cervical lymph nodes involvement. The preoperative stage of disease was determined by clinical examination, cervicothoracic CT scan, laryngoscopy, fibre-optic bronchoscopy and ultrasound neck with abdomen.

Biopsy of tumour for histological confirmation of diagnosis was done preoperatively. None of the patients had previous history of abdominal surgery. The cases were discussed in multidisciplinary meeting (MDT) and decision of surgical intervention was made. All cases underwent standard one stage surgical procedure which included total laryngo-pharyngo esophagectomy with bilateral inter jugular lymph nodal clearance. Figure-1. Resection of primary tumour was done in toto to achieve treatment as curative intent in all patients. Stomach was mobilized through upper midline laparotomy. The left gastric artery ligated and right gastroepiploic and right gastric arteries were saved. Figure-2

The cervical oesophagus was dissected under direct vision and sharp dissections were preferred, and the upper thoracic oesophagus was mobilized through blunt dissection to a level just above the carina. We conducted blunt mobilization of thoracic oesophagus until it was freed all around in the mediastinum. The esophagogastric junction was then transacted to complete total esophagectomy.

The stomach was then converted in to a tube by gastroplasty using stapling devices (Figure-3). This neo-oesophagus was then pulled through the posterior mediastinum up to the neck carefully not to axially rotate the tube in this process. The neo-oesophagus was then hinged with the prevertebral fascia in the neck and a hand stitched pharyngo-gastric anastomosis was performed using a single layer full-thickness continuously using 3–0 Vicryl Connell stitch, with second layer of interrupted stitches anteriorly if required. Anastomosis was reinforced by thyroid flap of uninvolved site. A neck drain was used in all patients. We performed thoracoscopic mobilization in 2 cases and 3 cases had laparoscopic harvesting of stomach. Feeding jejunostomy was done and nasogastric tube was inserted at the time of surgery in all patients.

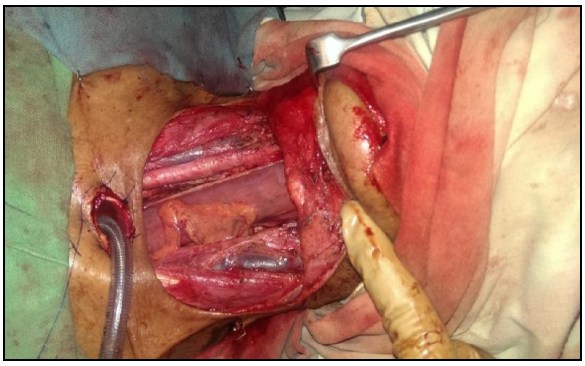

**Figure-1: Cervical bed after total laryngo-pharyngectomy**

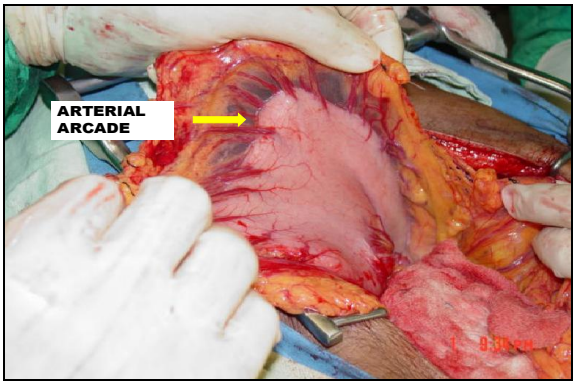


**Figure-2: Stomach harvesting on right gastroepiploic pedicle**

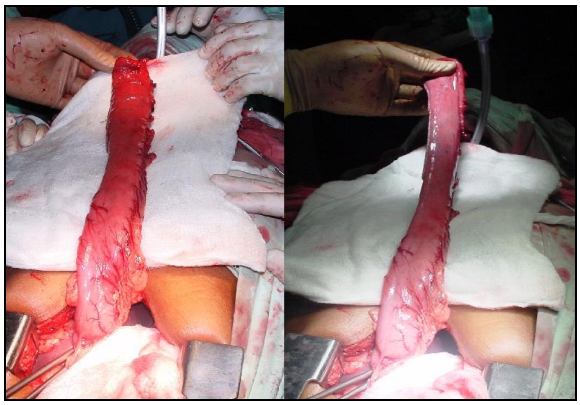

**Figure-3: Stomach used to form conduit**

## RESULTS

In this retrospective case series of 35 cases, 19 patients (54.28%) were males and 16 (45.7%) were females, with ages ranging from 30 to 69 years (mean age 56.43±11.92 years). The distribution of age is demonstrated in table-1.

In almost half of the patients 54.28% (n=19), the main symptom was dysphagia. Other presenting symptoms included dyspnoea, dysphonia, weight loss and pain.17 cases had tracheostomy at the time presentation. Symptomatology is summarized in table 2.

Out of 35 patients, 60% (n=21) had lesion of hypopharynx with post cricoid involvement, 37.1% (n=13) had primary tumour of cervical oesophagus abutting pharynx and cricoid and only one patient had a tumour of hypopharynx with perforation. Histopathological conformation of diagnosis was carried out in all patients preoperatively which showed well differentiated squamous cell carcinoma in 54.28% (n=19), moderately differentiated squamous cell carcinoma in 28.57% (n=10), poorly differentiated squamous cell carcinoma in 8.57% (n=3), basiloid squamous cell carcinoma in 2.85% (n=1) and well differentiated adenocarcinoma in 5.71% (n=2). The stage of the disease (according to the AJCC TNM staging), histopathology was as elaborated in Table-3. Most of the patients 74.28% (n=26) fell in stage 3, 14% (n=5) belonged to stage IVa and 11.42% (n=4) fall in stage I down staged by chemo radiation. Tracheal margin was positive in 1 and superior pharyngeal margin was positive in 3 cases. It is to be noted that all the stage I patients were down staged after neoadjuvant chemo radiotherapy from stage III and their stage of initial presentation was treated. All patients were node negative preoperatively. Inter-jugular lymph node dissection was performed in all patients. Nodal metastasis was found in 31.43% (n=11) out of 35 patients.

Operative time was less than 3 hours in 17 patients with two team technique, between 3–4 hours in 8 patients and more than 4 hours in 3 patients. Thyroid gland of normal side was saved in 25 patients while parathyroid glands were implanted in sternocleidomastoid muscles in 23 and in abdominal wall in 3 patients. Anastomosis was covered with thyroid in 25 patients and strap muscles were used in all 35 patients.

Guardian stich was applied in 5 patients were the anastomosis was under tension. Reflux was observed in 8 patients in our study. Patients were advised to take short frequent meals and to avoid going to bed with in 1–2 hours of meal. Postoperative complications were also evaluated. Patients developing cardiovascular complications including supraventricular tachycardia in 14.28% (n=5), Atrial Fibrillation in 5.71% (n=2), deep venous thrombosis in 2.85% (n=1) and myocardial infarction in 2.85% (n=1) patient. Chest complications included basal atelectasis in 22.86% (n=8) pneumothorax in 11.43% (n=4), pulmonary embolism in 2.85% (n=1), aspiration in 8.57% (n=3) and tracheal stenosis in 2.85% (n=1). 5.71% (n=2) cases had anastomosis leak while 8.57% (n=3) cases developed post-operative wound infection. Haemorrhage was seen in 2.85% (n=1) of cases, persistent hypothyroidism in 14.28% (n=5), hypocalcaemia in 11.43% (n=4) and reflux was seen in 37% (n=13) of cases. Post-operative 28 days mortality was 8.57% (n=3). Average survival of patient's stage 3 n=20 patients was 18 months. Patient had poor compliance to follow up.

**Table-1: Age Distribution**

| Age Range (years) | Frequency |
|---|---|
| 30–39 | 3 |
| 40–49 | 6 |
| 50–59 | 14 |
| 60–69 | 12 |

**Table-2: Symptomatology of disease**

| Symptoms | No. of patients |
|---|---|
| Dysphagia | 19 |
| Dyspnoea | 14 |
| Dysphonia | 2 |
| Weight loss | 10 |
| Pain | 8 |

**Table 3: Postoperative istopatholgyTNM staging**

| TNM stage | No of cases | Stage of disease | Percentage |
|---|---|---|---|
| T1NOM0 | 1 | 1 | 11.42 |
| T2N0M0 | 3 | 1 | |
| T3N0M0 | 16 | 3 | 74.28 |
| T3N1M0 | 10 | 3 | |
| T4aN0M0 | 4 | 4a | 14 |
| T4aN1M0 | 1 | 4a | |

## DISCUSSION

Tumours of cervical oesophagus and hypopharynx have poorest survival rates because of presentation at advanced stage, severe morbidity and oncological aggressiveness. It is also reported that lymph node

involvements in these tumours almost reach up to 70% which is an important factor in increasing patient's morbidity[7] and less chances to curative resection. Improvement in surgical procedures advances in field of anaesthesia and intensive care unit practices in many centres have shown slight improvement in quality of life and survival in patients with respective tumours.[8] For such extensive and advance stage presentation of these tumours, treatment is usually aggressive and involves combination of surgery and radiotherapy.

Total laryngo-pharyngo esophagectomy has become the method of choice for treatment of such extensive tumours over the last few decades. Various rebuilding techniques have been utilize including local flaps, myocutaneous flaps, free fasciocutaneous flaps, free jejunal interposition and gastric pull up each courting significant morbidity and mortality. The choice of reconstruction method also depends upon size and level of defect, complications rates, patient's general medical health and functional out come in terms of speech and swallowing. Stomach pull up now a day has become popular method reconstruction at various centre of world because of single stage reconstruction, lower chances of stenosis and leaks, rapid rehabilitation, more safety in post irradiated neck, lower incident of mortality and higher success.[9] We have used stomach visceral conduit in all of the cases. It also allows removal of entire oesophagus which has a higher incidence of second primary malignancy in hypopharyngeal squamous cell carcinoma patients. However, TLPO with gastric pull up still has reported mortality between 5% and 25% and overall complications between 26% and 55%.[10,11] Mediastinitis following flap necrosis, post-operative dysphagia, gastric reflux disease and anastomosis stricture and leak may have serious consequences. In our study all patients underwent total laryngo-pharyngo esophagectomy without injuries to vital structures followed by reconstruction using gastric pull up. Postoperative mortality in this study was seen in 3 patients (8.57%) likely because of their comorbid and these figures are compatible with the result attained internationally.

Multiple studies have revealed pulmonary complication between 21–40% when stomach is used for reconstruction.[12] A reasonable percentage of patient developed chest complications in our study including basal atelectasis in 22.86% (n=8) pneumothorax in 11.43% (n=4), pulmonary embolism in 2.85% (n=1), aspiration in 8.57% (n=3) and tracheal stenosis in 2.85% (n=1) Despite the improvement in morbidity and mortality of patients undergoing TLPO, complication rate is still very high. Studies are been aimed to obtain decision algorithms related to operative risk, in order to reduce morbidity and mortality, based on better patient selection.[13] Nowadays combined use of flaps is popular technique adopted for pharyngeal reconstruction reducing risk of leakage and fistula.[14] Similarly super charged method of anastomosis has been used nowadays to reduce tube necrosis by increasing vascularity of reconstructed region.[15]

The limitation of study was that preoperative staging was not accurate due to limitation of resources, especially lack of cytopathology for lymph nodes status and due to unavailability of PET scan; this is why only post-operative staging is presented in the study. All the cases were discussed in multidisciplinary board meetings before embarking on definitive treatment. There was also poor Compliance of patients for follow up.

## CONCLUSION

Upper cervical oesophageal and hypo-pharyngeal malignancies pose significant challenges in surgical management. Number of surgically operable cases is less because of advanced stage of disease at presentation. Total laryngo-pharyngo esophagectomy (TLPO) with stomach pull up offers good results in patients with resectable disease with acceptable morbidity and mortality.

## AUTHORS' CONTRIBUTION

FAM: Data collection, data analysis, abstract writing SA: Discussion writing. SF: Reference writing, proof reading. AA: Data analysis, proof reading. AR: Data analysis, proof reading. UZ: Data analysis, proof reading

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