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Original Research Article

Total pharyngolaryngectomy with laparoscopic transhiatal oesophagectomy with gastric pull-up: a study of 13 cases

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ABSTRACT

Background: Post cricoid cancers are known to be treated with total pharyngo-laryngo-oesophagectomy (TPLO) with several reconstructive procedures described. This study aims at clinical symptoms in patients having hypopharyngeal cancer who underwent total pharyngo-laryngectomy with laparoscopic transhiatal oesophagectomy (TPLO) with gastric pull-up (GPU).
Methods: The clinical data of 13 patients undergoing TPLO with GPU during July 2013 to September 2017 were evaluated. All the patients had biopsy proven carcinoma. TPL was done and laparoscopic Transhiatal oesophagectomy was done and also the stomach was mobilized laparoscopically. The neostomach was delivered through posterior mediastinum and pharyngogastric anastomosis was done.
Results: Only one patient (7%) had anastomotic stricture which required endoscopic dilatation, rest all the patients had no complications. So far they remain free of tumor recurrence or any other symptoms.
Conclusions: Laparoscopic GPU in a patient of TPLO should be the procedure of choice for maintaining the continuity of alimentary tract.

Keywords: Total pharyngo-laryngo-oesophagectomy, Laparoscopic gastric pull-up

INTRODUCTION

Hypopharyngeal cancers are often named for their location, including pyriform sinus, lateral pharyngeal wall, posterior pharyngeal wall, or postcricoid pharynx (see images below). Most arise in the pyriform sinus. 65-85% of hypopharyngeal carcinomas involve the pyriform sinuses, 10-20% involves the posterior pharyngeal wall, and 5-15% involves the postcricoid area.[1] Squamous cell carcinoma of the hypopharynx (HPSCC) usually presents with an advanced stage and generally has a poor prognosis. Surgery with postoperative radiation or chemoradiation therapy has been the standard treatment for HPSCC. In a review of the literature, only 15–34% of HPSCC patients are suitable for conservation surgery that is able to preserve laryngeal functioning.[2–4] Most patients need radical surgery, which includes total laryngectomy, partial or total pharyngectomy and/or esophagectomy. Radical surgery may result in a large surgical defect of the hypopharyngeal and cervical esophageal regions. Therefore, reconstruction of the surgical defect is important in order to restore the continuity of the gastrointestinal tract and allow oral alimentation.

Reconstruction of a hypopharyngeal defect is one of the most challenging and controversial problems facing the head and neck reconstructive surgeon, especially when treating a circumferential defect. Till date many reconstructive methods have been used to repair a hypopharyngeal defect. These are local flaps, myocutaneous flaps, free fasciocutaneous flaps, free

jejunal interposition, and gastric pull-up. Every method has its advantages and disadvantages. The choice of reconstruction depends on the size and level of the defect, the complication rate, overall morbidity, the patient's general medical health. The surgeon's familiarity and experience with the different reconstructive techniques also play an important role in the method chosen. Currently, there is no general consensus with regard to what constitutes the best method of reconstruction after laryngopharyngectomy. When the residual mucosa of the hypopharyngeal defect is >3 cm in width, this a primary closure of the pharynx is possible without the need for tissue transposition.[6] If insufficient mucosa remains, pedicled or free tissue transfer patch flaps may be inserted into the defect site to allow reconstruction. This study was done to analyze the complications and long term follow up of patients undergoing gastric pull for advanced hypopharyngeal carcinoma.

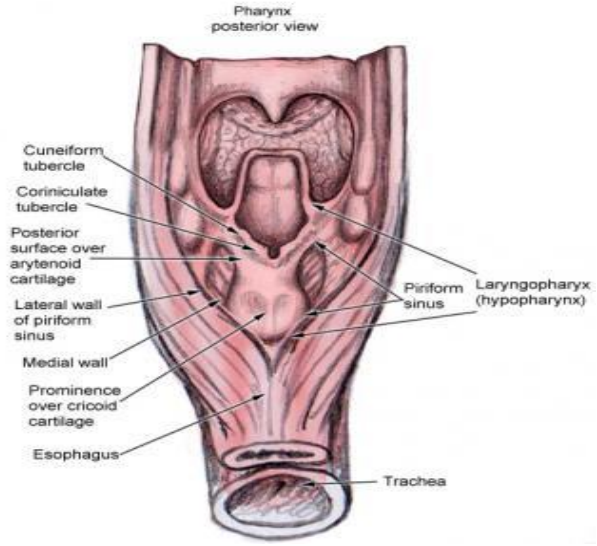

Figure 1: Posterior view pharynx.[5]

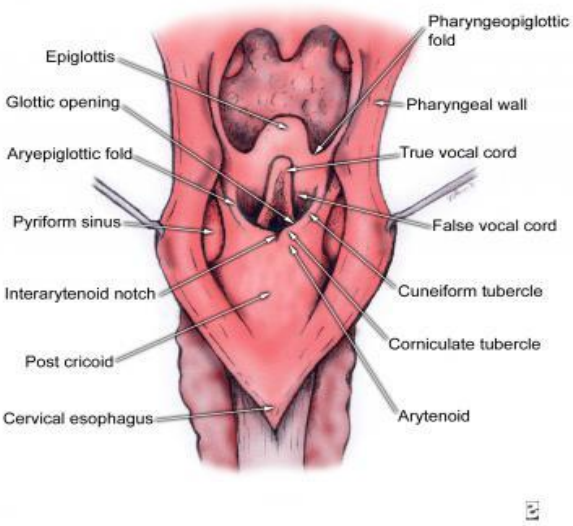

Figure 2: Hypopharyngeal anatomy.[5]

METHODS

This retrospective study was conducted at Galaxy CARE Laparoscopy Institute, Pune, Maharashtra, India from July 2013to September 2017. A total of 13 cases were reviewed for any complications. The following patients were included in our study, biopsy proven Post cricoid, larynx, hypopharygeal carcinoma; Computed tomography (CT scan) suggestive of resectable lesion; no history of surgery on stomach.

Procedure

Total pharyngo-laryngo-oesopgagectomy

Patient was placed in supine position with neck extended. A'U' shaped incision was taken, 2 finger breadth above the sternal notch and extending from one mastoid process to another mastoid process and subplatysmal plane was raised. A standard TPLO was performed.

Laparoscopic transhiatal oesophageal dissection and gastric pull-up reconstruction

The patient was placed in modified lithotomy position with neck extended. The surgeon stood in between the patient's legs with one assistant on each side. Five trocars were then inserted in a pentagon shape. After a thorough investigation of the abdominal cavity, dissection of the gastroesophageal junction was performed with mobilization of the gastroesophageal junction and opening of the hiatus. Stomach mobilization was then performed as in open surgery with the blood supply to the stomach based on the right gastric and right gastroepiploic arteries. Dissection was performed using the harmonic scalpel and endoclips (Ethicon Endosurgery, Cincinnati, OH), when needed. All adhesions of the gastric posterior wall to the pancreas were dissected until full mobilization of the stomach was achieved. An extensive Kocher maneuver was performed to ensure optimal gastric mobilization to the thorax. Dissection of the thoracic esophagus was performed under direct vision with a 0° laparoscope. Division of the posterior esophageal vessels originating from the aorta was performed using the harmonic scalpel and endoclips. The posterior mediastinal dissection was performed upto the level of carina. The anterior and lateral wall dissection was then completed. Mediastinal lymph nodes were dissected en bloc with the esophagus. The vagal nerve fibers were identified and divided. Transhiatal oesophagectomy and stomach mobilization was completed laparoscopically. The entire stomach was pulled up in the neck. No abdominal incision was taken. The stomach tube was prepared in the neck and anastomosis of the stomach to the base of tongue was performed.

RESULTS

In our study we found that 23% (n=3) were males and 79% (n=10). All the patients were suffering from post-

cricoid carcinoma, and had biopsy proven Squamous cell carcinoma. All the patients were systematically evaluated, optimized nutritionally, counseled for voice box prosthesis and posted for surgery. 23% (n=3) patients took neo-adjuvant treatment in the form of chemo-radiotherapy. The average time of surgery was 150 minutes (mean 120-180 minutes). After discharge all the patients were regularly followed up on OPD basis and reviewed for any complications. Of all the patients only 7% (n=1) had anastomotic stricture and needed dilatation for the same. None of the patients had positive surgical margins and histopathology report was Squamous cell carcinoma. 4 patients had reflux but were managed conservatively. Thus we had no mortality and morbidity in our study.

Table 1: Results of our study.

Age	(41-50 yrs) 2; (51-60 yrs) 6; (61-70 yrs) 3; (70-80 yrs) 1; (90-100 yrs) 1
Sex (M:F)	3: 10
Location of tumour	Post cricoid-10; Larynx-1; Hypopharynx-2
Post CT/RT	3
Time taken	150 minutes (120-180 minutes)
Complications	Anastomotic stricture-1
Mortality	NIL

DISCUSSION

Squamous cell carcinoma of the hypopharynx usually presents with an advanced stage and generally has a poor prognosis. The reasons for this poor prognosis are late presentation, submucosal spreading and early lymphatic/distant metastasis.[6] Surgery with postoperative radiation or chemoradiation therapy has been the standard treatment. The reconstructive options have evolved over many years from multistaged procedures with poor surgical outcome to single-stage reconstruction with a superior functional result. The ideal method for hypopharyngeal reconstruction should have the following attributes if possible: single-stage procedure, high success rate for tissue transfer, low donor-site morbidity, low fistula and stenosis rates, restoration of the ability to speak and swallow, able to achieve a successful reconstruction in heavily radiated areas and tolerance of postoperative radiotherapy. Gastric pull-up reconstruction is often recommended for tumors that have invaded to the cervical esophagus because it allows an adequate inferior margin below the thoracic inlet and the removal of a potential skip lesion of the esophagus. Gastric pull-up has a number of advantages, including being a one-stage procedure with a single intestinal anastomosis, good vascularity of the stomach and base of tongue, leak rates and stricture rates are the lowest, and if done laparoscopically no abdominal incision, safety of the procedure. It has the lowest rate of stricture of all flaps and has a more than 90% flap success rate. The use of stomach as a method of reconstruction was first described by Turner in 1936 and modified by Ong and Lee in 1960.[7,8] Major intraoperative and postoperative complications anticipated are embolism, leakage of anastomotic leak, bleeding, myocardial infarction, pneumonia, adult respiratory distress syndrome, tracheal necrosis, gastric necrosis, anastomotic stenosis and chylous fistula. Moreover, minor complications such as wound infection were evaluated. However, gastric pull-up is a procedure with a higher morbidity; there is a reported mortality of between 5% and 25% together with an overall incidence of complications of between 26% and 55%.[9–11] Mediastinitis may result after flap necrosis and has serious consequences. Postoperative swallowing and voice rehabilitation are additional problems. The absence of a gastroesophageal sphincter causes gastric reflux disease or dumping syndrome in 15–20% of all patients.[11] This can be minimized by instructing patients to take small, frequent meals and to sleep in a head-up position. The tracheoesophageal speech of these patients may be weak and gurgling because of the poorly vibrating nature of the segment of the flaccid stomach used and because of gastric secretions.

Our study showed that by following meticulous dissection and proper ICU support the postoperative complication rates can be decreased. Post-operatively all the patients were shifted to ICU and were kept on ventilator and extubated after 24 hours. Nasogastric feeding was started 24 hours after the surgery. Dye study was done on 7th day and oral feeds were started if the dye study was normal. Patients were discharged on 7th day. One patient was discharged on 8th day. Though our anastomotic stricture rate was higher than as compared to world literature, but still overall the complication rate is much lower which can be seen from the following table.[12]

Table 2: Comparison of different studies.

	Anastomotic leak	Haemorrhage	Pneumonia	Wound infection	Anastomotic stricture	Death
Shuangba[12]	9.1%	---	11.1%	3.9%	3.4%	4%
Homma[13]	30%	20%	10%	10%	---	---
Shreehariprasad[14]	6%	---	---	12%	---	8.3%
Ullah[15]	---	---	4%	---	---	12%
Triboulet[16]	15.7%	---	19.7%	---	---	---
Our study	---	---	---	---	7%	---

Our study showed that for a defect created after TPL, laparoscopic transhiatal oesophagectomy with GPU with pharyngogastric anastomosis is the procedure of choice.[12,13,15,17,18]

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