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Clinical outcomes of open surgical gastrostomy in patients with obstructive head and neck and esophageal carcinoma: a retrospective audit from Khyber Pukhtunkhwa

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ABSTRACT

Background and Objectives: Gastrostomy is a well-established procedure for enteral feeding in patients with obstructive head and neck carcinomas. The aim of the present study was to assess the mortality rate and other complications associated with open surgical gastrostomy (OSG) in patients with obstructive head and neck and esophageal carcinomas in local population.

Methods: This retrospective audit was conducted at the surgical unit of a teaching hospital at Khyber Pukhtunkhwa from January 2013 to December 2019. A total of 30 head and neck cancer patients undergoing OSG for enteral feeding were included in this study. The gastrostomy procedure was performed under local anesthesia. Patients were discharged on fourth to sixth postoperative day after enteral feeding was fully established. The patients were followed up for any complications on 10th and 30th day postoperatively.

Results: The mean age of the patients was 42.3 ± 13.55 years (range 23 to 70 years). Females were affected more commonly than males. One patient died during postoperative admission, while another patient passed away after getting discharged within first 30 days, postoperatively. Thus, the mortality rate was recorded as 6.66% ($n = 2$). No major complications were recorded while the minor complications including tube blockage, tube dislodgment and peri-catheter infection were noted.

Conclusion: Open surgical gastrostomy under local anesthesia is a safe and easy procedure for enteral feeding with low rate of complications in patients with obstructive carcinomas of head and neck.

Keywords: Surgical gastrostomy, outcome, head and neck cancer, esophageal cancer, enteral feeding, complications.

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Introduction

There are numerous conditions that may block the normal route of the digestive tract and compromise the passage of food to stomach. These include neurological disorders, debilitating systemic disease, and malignancies involving oral cavity, pharynx, larynx, and esophagus. These patients with swallowing defects are at an increased risk of developing nutritional deficiencies.¹ Hence, nutritional support is imperative for such patients.

Access for enteral nutrition may be considered for patients who have a functional gastroenteric tract but have difficulty

with swallowing.² Nasogastric tube feeding has been the procedure of choice for feeding patients in acute settings for a short period; however, it has some limitations such as obstruction from residues of food, frequent displacement, and need for regular replacement.³ Prolonged use of nasogastric tube can be accompanied by some complications such as damage to the nose and larynx, chronic sinusitis, gastro-oesophageal reflux, and aspiration pneumonia.¹ Gastrostomy feeding is a well-established procedure for

feeding people in whom oral intake is either not possible or not safe, on a long-term basis.²

Gastrostomy can be performed by three-principle techniques: 1) percutaneous endoscopic gastrostomy (PEG); 2) fluoroscopy-guided gastrostomy by an interventional radiologist (IR-gastrostomy) and 3) surgical gastrostomy that can be either open [Open surgical gastrostomy (OSG)] or laparoscopic.⁴

Each gastrostomy technique has a unique advantage and disadvantage; some are more feasible and safer while contraindicated in certain cases or pose a high morbidity to some patients. Many centers consider PEG to be intervention of choice due to its simplicity and effectiveness;^{2,5} however, OSG is also commonly performed, especially in patients who are unable to undergo PEG.⁶ PEG is not feasible in all situations and is avoided in some situations such as head and neck tumors or strictures of esophagus, where it is impossible to access the stomach endoscopically^{3,5}, previous surgery of the abdomen or stomach, hepatomegaly or a previous failed attempt at PEG.⁵

OSG has been performed since the nineteenth century. It is commonly performed using a technique described by Stamm in 1894.³ The Stamm gastrostomy is performed at laparotomy via small upper midline or left midrectus incision. It implies securing the stomach with anterior abdominal wall after fixing gastrostomy tube in stomach with double purse string suture. The gastrostomy tube is brought out through a separate opening in anterior abdominal wall.⁷ Traditionally, the procedure is performed under general anaesthesia, which is associated with high morbidity and mortality.² However, since most of the patients undergoing feeding gastrostomy are unable to tolerate general anesthesia, there have been few studies in the past where surgeons performed OSG under local anesthesia. These include studies by Sharma et al.⁸, Yur and Aygen⁹, Zorron et al.¹⁰, Faria and Taveira-Gomes¹¹, and Zickler et al.¹²

OSG is associated with certain major complications, such as aspiration pneumonia, peritonitis, wound dehiscence, colonic perforation, and death.^{3,10} The minor complications associated with OSG include wound infection, diet leakage from sides of tube, obstruction of the tube, seroma formation, and tube dislodgement.³

Nonetheless, OSG is still commonly performed for above-mentioned carcinoma cases in Pakistan. It is, therefore, mandatory to determine the outcomes of the procedure in our population to improve patient satisfaction and quality of life in the future. The aim of the study was to determine the outcomes of open gastrostomy using Stamm technique under local anesthesia in patients with head and neck cancers in a local population of Khyber Pakhtunkhwa, Pakistan.

Methods

This retrospective audit was conducted at the Surgical Unit of Mufti Mehmood Memorial Teaching Hospital, Dera Ismail Khan, Khyber Pukhtunkhwa from January 2013 to December 2019. A total of 30 patients with carcinomas of head and neck undergoing OSG for enteral access feeding were included. Head and neck cancers included primary or secondary obstructive malignancies involving oral cavity, pharynx, and upper one third of esophagus. Patients having lower third esophageal carcinomas, or with metastasis to stomach or having extremely debilitating co-morbid conditions rendering unfit for surgical procedure, were excluded. Due to decreased nutritional intake, the quality of life of all these patients was deteriorated significantly. After baseline laboratory profile analysis, intervention for enteral nutrition through a gastrostomy tube was planned.

A modified Stamm Gastrostomy procedure with a single incision under local anesthesia with lignocaine injection was performed in all the patients. In addition, tramadol was given intravenously as an analgesic and sedative along with an antiemetic. After ensuring that the local anesthesia was effective, approximately 4 cm left upper paramedian incision (left upper midrectus incision) was given. For the gastrostomy, a 22 French three-way Foley catheter was placed in the lumen of the stomach which was then closed with a purse string suture of vicryl 2/0. A second outer purse string suture was placed to bury the first layer. The tube was brought out through upper end of incision and the stomach was anchored to the abdominal wall. Catheter was secured with the skin after closing the abdomen. All the patients were given ceftriaxone 1,000 mg intravenously twice daily for first 3 days which was replaced by syrup (given per gastrostomy tube) on fourth postoperative day.

Gastrostomy feeding (50 ml/2 hours) in the form water, juices, milk, and preparation made from Ensure powder was started after 24 hours. In next 3 days, single feed was increased to 100 ml every hour except for 8 hours during the night, thus making a total of 1,600 ml of intake in 24 hours, which was considered as sufficient for underweight patients. The patients were discharged on fourth to sixth postoperative day after proper gastrostomy feeding was ensured. Patients were counseled to take care of the gastrostomy tube and were advised an antibiotic course with paracetamol and ranitidine syrup at home. A first follow-up visit was conducted at the 10th postoperative day for removal of abdominal sutures. Second follow up visit was done on 30th postoperative day to assess their clinical condition.

Statistical analysis

Data were entered and analyzed using SPSS 20.0. Frequencies and percentages were measured for categorical variables,

such as gender and types of cancer. Mean and standard deviation were calculated for quantitative variables such as age. In order to compare the frequency distribution between age groups and tumor location; age groups and complications; and gender and tumor location, Fischer's exact test was applied. A p value of less than 0.05 was considered to be significant.

Results

The mean age of the patients was 42.31 ± 3.55 years (range 23 to 70 years); there were 23 (76.7%) females and 7 (23.3%) males. Esophageal carcinoma was seen in 15 (50%) patients, while carcinoma of hypopharynx and oral cavity was seen in 9 (30%) and 6 (20%) patients, respectively.

Regarding the histological type, squamous cell carcinoma was found in 28 (93%) patients and esophageal adenocarcinoma was reported in only two patients (7%). Out of 28 patients with squamous cell carcinoma, 9 (32%) were well differentiated, 12 (43%) were moderately differentiated, and 7 (25%) were poorly differentiated. The adenocarcinoma esophagus in both of our study patients was moderately differentiated.

On post-operative follow-up, only two patients died with a mortality rate of 6.7%. A 45-year-old female with advanced carcinoma of hypopharynx died in the ward. Another 70 years old male with advanced esophageal carcinoma died within 1 month post-operatively after discharge. Both the patients died from their underlying disease as the gastrostomy was working optimally.

With regards to minor complications, tube blockage was seen in 2 (6.7%) patients. In both the cases, the tube was immediately washed with normal saline to keep the lumen patent. Peri-catheter infection occurred in 3 (10%) patients who were treated by enteral antibiotics and pyodine dressings on the infected area. Only one 1 (3.3%) patient was reported with tube dislodgement on 25th postoperative day which was re-inserted after lubricating the tube with xylocaine gel. The balloon of tube was inflated once in stomach lumen and also the tube was fixed externally to the skin by applying a stitch.

No complication was found in rest of the 22 patients during 1 month follow-up period.

No significant association was found between the site of the tumor and age or gender ($p = 0.291$ and $p = 0.198$, respectively). Similarly, the complications noted post-operatively were not significantly associated with the age of the patients ($p = 0.698$) (Tables 1,2,3).

Discussion

In this study, OSG was performed in patients with obstructive head and neck and esophageal cancers through a small sized

single incision under local anesthesia to avoid complications due to general anesthesia. All the patients were very weak and anesthetist was reluctant to give general anesthesia in these patients. In order to achieve analgesia and mild conscious sedation during the procedure, tramadol infusion was given while Yur and Aygen⁹ and Zorron et al.¹⁰ used midazolam infusion for sedation.

There were no major complications in the present study, while the two deaths (6.6%) that occurred within first 30 days postoperatively, were due to their underlying illness and poor health status. Sharma et al.⁸ and Yur and Aygen⁹ showed that open gastrostomy performed under local anesthesia in their patients was not associated with any death or other complications. Sharma et al.⁸ conducted a study on 54 patients with neuromuscular diseases, while Yur and Aygen⁹ had their study on 28 patients having different indications for gastrostomy that included neurological illnesses predominantly. Zorron et al.¹⁰ used a modified technique for single access gastrostomy in 19 patients with neurological disorder or malignancies, under local anesthesia and reported two deaths within 1 month postoperatively, and both deaths were due to their preexisting medical condition. However, there was one case of iatrogenic injury to transverse colon, that was sutured without complications and there were two (5.6%) cases of wound dehiscence. Faria and Taveira-Gomes¹¹ demonstrated no mortality during first 30 days among 23 patients (having predominantly neuromuscular diseases) who underwent simplified open gastrostomy under local anesthesia while there was increased mortality in patients with oncological diseases who underwent Stamm gastrostomy under general anesthesia; five out of 40 patients died from pneumonia thus concluding that OSG performed under local anesthesia was associated with better survival, although there was a case of abdominal abscess and another of peritonitis, that needed surgical intervention. Mahawongkajit et al.¹³ in a study on 36 advanced esophageal cancer patients described one case of bowel perforation (2.8%) and two cases of wound dehiscence requiring surgical intervention while there was no mortality.

As far as minor complications are concerned, we had two patients having tube blockage (6.7%), three with pericatheter infection (10%), and only one patient with tube dislodgement (3.3%). Whereas Sharma et al.⁸ and Yur and Aygen⁹ reported no complications. Zorron et al.¹⁰ reported wound infection (5.26%), tube dislodgement (5.26%), and leakage of gastric content (5.26%) in three different patients. Mahawongkajit et al.¹³ registered three cases of surgical site infection (8.3%), five cases with tube leakages (13.9%) and two cases of tube dislodgement (5.6%).

Further studies with a prospective design, longer follow-up period and anthropometric measurements (measurement of

Table 1. Frequency of site of tumor with respect to (w.r.t) age group (n = 30).

Age groups	Tumor location			Total	p value
	Esophagus	Oral cavity	Hypopharynx		
21-35 years	6 (40%)	4 (66.7%)	3 (33.3%)	13 (43.3%)	0.291*
36-50 years	3 (20%)	1 (16.7%)	5 (55.6%)	9 (30%)	
51 years and above	6 (40%)	1 (16.7%)	1 (66.7%)	8 (26.7%)	
Total	24	2	3	30	

* = Fisher's exact test applied.

Table 2. Frequency of site of tumor w.r.t gender (n = 30).

Gender	Tumor location			Total	p value
	Esophagus	Oral cavity	Hypopharynx		
Male	2 (13.3%)	3 (50%)	2 (22.2%)	7 (23.3%)	0.198*
Female	13 (86.7%)	3 (50%)	7 (77.8%)	23 (76.7%)	
Total	15	6	9	30	

* = Fisher's exact test applied.

Table 3. Frequency of complications w.r.t age group (n = 30).

Age groups	Complications				Total	p value
	None	Tube blockage	Pericatheter infection	Tube dislodgement		
21-35 Years	10 (41.7%)	1 (50%)	1 (33.3%)	1 (100%)	13 (43.3%)	0.698*
36-50 years	8 (33.3%)	1 (50%)	0	0	9 (30%)	
51 years and above	6 (25%)	0	2 (66.7%)	0	8 (26.7%)	
Total	24	2	3	1	30	

* = Fisher's exact test applied.

weight and body circumferences) before operation and at follow-up visits may be undertaken to have a more detailed understanding of the surgical outcomes in such patients.

Conclusion

OSG under local anesthesia is a successful procedure with a low occurrence of complications. This procedure is performed easily in underweight patients. OSG under local anesthesia may be undertaken safely wherever PEG facility is not available or when PEG is not possible due to tumor obstructing the passage of endoscope.

Limitations of the study

Limitation of the present study was a small sample of retrospective 30 patients from a single center. The study may be supplemented with possible future larger scale studies in order to strengthen the observations.

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List of Abbreviations

OSG Open surgical gastrotomy
PEG Percutaneous endoscopic gastrotomy
w.r.t with respect to

Conflict of interest

None to declare.

Grant support and financial disclosure

None to disclose.

Ethical approval

Ethical approval has been taken by the Ethics Committee of the Gomal Medical College, Dera Ismail Khan, Pakistan vide reference letter number 87/ AD/ Research/ GMC/21 dated 16/01/2021.

Authors' contribution

SQF: Conception and design of the study, critical analysis with intellectual input, analysis and interpretation of data, drafting the manuscript.

IB: Acquisition, analysis and interpretation of data.

AAM, AS, AA: Acquisition of data.

ALL AUTHORS: Approval of the final version of the manuscript to be published.

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