PERCUTANEOUS RADIOLOGIC GASTROSTOMY: RESULTS AND COMPLICATIONS

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Background: Percutaneous endoscopic gastrostomy is usually difficult in patients with malignant involvement of oral cavity, pharynx and esophagus. Flouroscopic guided insertion of Gastrostomy catheter with Gastropexy have gained acceptance because it is easy and less time consuming as well as less invasive as compare to surgical procedure[5]. This study was done to evaluate the safety and efficacy of percutaneous placement of gastrostomy with gastropexy using imaging guidance in patients with oropharyngeal and esophageal cancers. **Methods:** Over five years, 105 patients were referred to our department for percutaneous radiologic gastrostomy. In five patients the procedure was not performed because of overlying viscera and high position of stomach. We performed 100 gastrostomies with gastropexy procedures using seldinger technique. **Results:** Success rate for percutaneous radiologic gastrostomy was 100%. No major complication had occurred. There were 11 minor complications occurred including 4 stomal infection, 3 catheter obstruction, one peritonism and three were extensive pneumoperitoneum. Stomal infection and catheter obstruction were not related to procedure. So, our true minor complications were only 4 (4%) which is comparable to literature. **Conclusion:** Percutaneous radiologic gastrostomy is an effective and safe procedure for enteric access of nutrition in patients with oral, pharyngeal and esophageal cancer where percutaneous endoscopic gastrostomy is difficult.

Keywords: Interventional procedure, Complications, Gastrostomy

INTRODUCTION

Patients with oropharyngeal and esophageal cancers have experience problems related to swallowing[1]. Secondary malnutrition in patients with oropharyngeal and esophageal tumors can be the cause of substantial morbidity[2]. They either require parenteral nutrition or enteric route for nutrition. In long term, nasogastric tube and parenteral nutrition are not feasible. Parenteral route is usually used for short term nutritional requirement[3].

The common side effects of nasogastric tube are mechanical failure and aspiration pneumonia which further aggravate the morbidity[4].

Since the introduction of Gastrostomy in 1981, there is significant increase in acceptance for indirect enteric route. However different technique has been described and include surgical, percutaneous endoscopic and image guided Gastrostomy[5]. Percutaneous endoscopic gastrostomy (PEG) is usually difficult in patients with malignant involvement of oral cavity, pharynx and esophagus[6]. Flouroscopic guided insertion of Gastrostomy catheter with Gastropexy have gained acceptance because it is easy and less time consuming as well as less invasive as compare to surgical procedure[5]. Gastropexy provided stability of anterior stomach wall to anterior abdominal wall resulting reduced peritoneal spillage of Gastric contents, hemorrhage and catheter Displacement[7].

Most of the previous studies have focused on gastrostomy without gastropexy. However few recent studies have reviewed the advantages of gastrostomy with gastropexy[5,7,9]. In our review of literature only one study evaluated enterostomy with gastropexy in 701 patients[5].

The purpose of our study is to evaluate the safety and efficacy of percutaneous placement of gastrostomy with gastropexy using imaging guidance in patients with oropharyngeal and esophageal cancers.

MATERIAL AND METHODS

The study was conducted from Jan 1998 to Sep 2004, total of 105 patients were included in which 75 males and 30 females, age range was 23- 82 years. All patients with cancer of oral cavity, pharynx and esophagus referred to our department for gastrostomy were included. Most of the patients had large masses of oral cavity, pharynx and narrowed esophagus with difficult endoscopic placement of gastrostomy. Five patients were excluded because three had overlying viscera and two had high position of stomach. Five patients had deranged coagulation which was corrected after transfusion of fresh frozen plasma (FFP). Stomach was distended with NG tube, in ten patients difficulty was faced for placement of NG tube; however they were placed after manipulation by glide wire under fluoroscopic control in these patients. After gastric insufflations intravenous injection of Buscopan 20mg was given for gastroperesis in all patients. After sterile cleansing with Pyodine of left subcostal and epigastric region, injection Xylocane 2% was given at the site of puncture under fluoroscopic guidance. Puncture site

was over the distal part of body of stomach, just below the left costal margin and above the transverse colon. After local anesthesia, small skin incision was made and subcutaneous tract was created with blunt-nosed hemostate. Gastric puncture was performed using single T fastener needle with brief deliberate thrust. After entering in stomach water soluble contrast was injected to confirm the needle position, followed by introduction 0.038in J- tipped guide wire through needle. Needle was withdrawn over guide wire and then suture was tied. Serial dilatation of percutaneous gastric tract was done to 12-14 F, followed by placement of a 12-14F of diameter and 30 to 35cm of length of polyurethane pigtail gastrostomy catheter over the guide wire. After placement of catheter in stomach pigtail was formed by pulling the thread and it was secured at distal end. Catheter was fixed on skin by skin-securing device.

Data collection criteria were defined at the start of study and included indications, procedure success rate, minor and major complications, and one month mortality rate. Minor complications were defined as moderate to large pneumoperitoneum, peritonism, superficial stomal infection, pneumonia and new onset of aspiration. Major complications were defined as peritonitis, hemorrhage which needs transfusion, external leaks requiring catheter replacement, severe infection at puncture site. Small amount of pneumoperitoneum was not considered as a complication.

RESULTS

Success rate for percutaneous radiological gastrostomy (PRG) was 100% (Fig. 1). Five procedures were not possible including those 3 patients, who had overlying viscera and 2 patients had high positioned stomach. Five patients had deranged coagulation, which were later corrected by fresh frozen plasma (FFP) before the procedure. There was no major complication noted within 30 days of follow-up. Three patients had extensive pneumoperitoneum (Fig. 2). This was revealed on retrospective review of images, most likely cause of this was over distention of stomach with air. However all patients were recovered uneventfully with conservative therapy within two weeks. No further sequele were noted at 30 days of follow-up. Four patients developed stomal infection, two developed after two weeks of procedure and other two developed after 20th day of procedure. All of them successfully treated with oral antibiotics with tropical antiseptics. In all cases cause of stomal infection was dirty dressing, which was changed in all patients. Three patients had blockage of catheter, all of them came in radiology department to check the patency of catheter, which was evaluated by injecting water soluble contrast through the catheter under fluoroscope. Cause of blockage was found to be thick food contents. After flushing with normal saline catheters were re-open and patency was confirmed with contrast injection. None of them needed catheter replacement. One complication occurred in 65 years old man with metastatic carcinoma of esophagus who required enteric feeding for nutrition. The initial gastrostomy catheter placement was uneventful, but the patient subsequently developed increasing abdominal pain without fever or elevated WBC count. Ultrasound of abdomen showed minimal streak of fluid in pelvis. Patient recovered well from the presumed peritonism with conservative management. No further sequel was noted at 30 days of follow-up. There was no case of gastrointestinal bleeding from puncture site. No visceral injury with needle puncture. No minor or major complication of gastropexy device was observed. All patients started feeding at 24 hours of procedure. Summary of complications is mentioned in Table 1.

Table 1: Complications in placement of percutaneous radiologic gastrostomy (prg) catheter

Complications	No. of Patients	%
Peritonitis	0	0%
External leak	0	0%
Peritonism	1	0.6%
Pneumonia	0	0%
Superficial stomal infection	4	2.6%
Tube malfunctioning/Obstruction	3	2%
Extensive pneumoperitoneum	3	2%

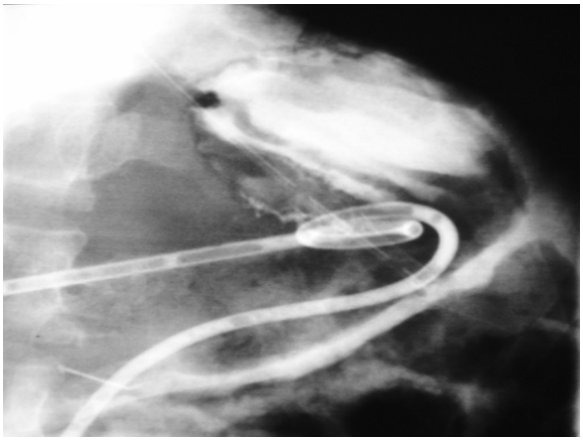

Figure-1. Gastrostomy Catheter with single T-fastener

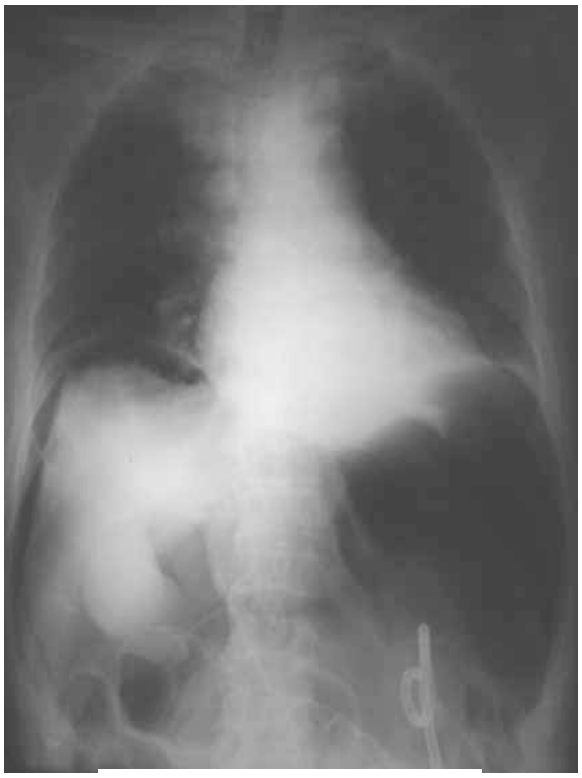

Figure-2. Pneumoperitoneum

DISCUSSION

Percutaneous endoscopic gastrostomy (PEG) has some advantages over percutaneous radiologic gastrostomy (PRG), such as, there is no radiation and procedure can be performed at bed side. However, if patient has obstructive aero digestive system due to malignant mass or stricture, endoscopy is very difficult[6]. PRG procedure is quickly and easily performed without need of intravenous sedation or general anesthesia. Procedure time, hospital stay and cost are less as compare to surgical or endoscopic procedure. Major complications of PRG are also low as compare to PEG[8]. Our study organization was designed to follow that of Dewald et al[5] 1994. We followed the same definitions of minor and major complications of PRG as comprehensively addressed by Ryan et al[9] and Dewald et al[5]. Gastrostomy was performed by three or four T-fasteners technique in most of studies[5, 7, 9]. However, Deutsch et al [10] mentioned that there is no need for T-fastener gastropexy; it may increase risk of hemorrhage by additional four 18-guague needle punctures for gastropexy. In literature largest series[5] does not mentioned any complication related to T-fastener gastropexy. We performed gastropexy with single T-fastener. We did not encounter any complication specifically related to gastropexy. However there is always risk for loss of gastric access with displacement of gastric wall in gastrostomy with out gastropexy[11, 12]. Gastropexy is easy to learn and not prolong the duration of procedure. It also reduces the risk for intraperitoneal spillage of gastric contents and also facilitates the use of larger size catheter. Fixation of the gastric wall to the abdominal wall may also reduce tamponade of the insertion site may reduce the occurrence of hemorrhage. Among the 100 successful procedures no major complications occurred. There were 11 minor complications encountered included peritonism, superficial stomal infection, catheter obstruction and extensive pneumoperitoneum.

We compare our study with those in which gastropexy was performed (Table 2).

Out of 11 minor complications 4 patients had developed stomal infection after approximately 2 weeks of procedure and this was not directly related to procedure, all were secondary to poor care of stoma. Other 3 patients who developed catheter obstruction, also not related directly to procedure rather attributed to thick food contents. So only four patients truly developed minor complications directly related to procedure, in which one patient developed peritonism who recovered uneventfully with use of antibiotics and local antiseptics. Three out of eleven patients developed extensive pneumoperitoneum, retrospective evaluation showed over distention of stomach by air using NG tube. Our true minor complications were only 4% which is comparable to literature.

Table 2: comparison of results of percutaneous radiologic gastrostomy performed with gastropexy

STUDY	No. OF PATIENTS	COMPLICATIONS%		30 days Mortality	Over-all Mortality	No. of Gastrostomy procedures	No. of Jejunosotomy procedures
		MINOR	MAJOR				
Saini et al 1990[7]	125	10	1.6	11	0	125	0
Ryan et al 1997[9]	314	3.2	1.9	3.8	0.3	*	*
Dewald et al 1999[5]	550	5.3	0.5	5.9	0	58	643
Our study	100	11	0	0	0	100	0

* They were not mentioned number of gastrostomy and gastrojejunostomy separately.

CONCLUSION

Percutaneous radiologic gastrostomy with gastropexy is an effective and safe procedure for enteric access of nutrition in patients with oral, pharyngeal and esophageal cancer where percutaneous endoscopic gastrostomy is difficult.

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