Original Article | Palliative Medicine and Palliative Care for Incurable Cancer

Cervical gastric decompression tube: safety and efficacy outcomes for inoperable malignant bowel obstruction

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Background: Inoperable malignant bowel obstruction, which results in chronic nausea, vomiting and abdominal pain, often requires nasogastric tube decompression. However, these tubes are often uncomfortable for patients and require hospitalization during the end-of-life care. Cervical esophago-gastric (CEG) decompression tubes are a potential palliative solution. The objective of this study is to present the outcomes of CEG tubes in 11 patients with malignant bowel obstruction.

Methods: We performed a retrospective review of patients requiring nasogastric tube decompression who received CEG decompression tubes for inoperable malignant bowel obstructions between 2016–2022. CEG tube placement was performed percutaneously through the left neck using a guidewire and an endoscopic technique.

Results: The average age of patients was 58 years (31–72 years), with metastatic colorectal cancer (36.4%) and ovarian cancer (27.3%) being the most common causes of malignant bowel obstruction. All procedures were completed percutaneously, without requiring conversion to open procedures. The morbidity of the procedure was 27%, which included tube dislodgement, local cellulitis, or bleeding at the insertion site. None of the patients required reoperation, with most of the patients successfully treated conservatively. Most patients were discharged home after the procedure (82%); however, 45% were readmitted (mostly due to abdominal pain). Most patients (73%) were able to continue additional chemotherapy after tube placement. The average survival from cancer diagnosis was approximately six months, whereas the average survival after the procedure was about four months. No mortalities occurred due to CEG tube placement.

Conclusions: A CEG decompression tube is safe for patients with malignant bowel obstruction. The procedure allows patients to undergo additional chemotherapy and be discharged home with a more comfortable tube.

Keywords: Malignant small bowel obstruction (MSBO); gastrointestinal decompression; percutaneous endoscopic gastrostomy tube; nasogastric tube; cervical esophago-gastric tube (CEG tube)

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Introduction

Primary tumors, notably of the stomach, gallbladder, colon, uterus, and ovaries, can lead to malignant small bowel obstruction (MSBO) due to peritoneal carcinomatosis (1). Patients with advanced-stage malignancies exhibit MSBO that is often inoperable and terminal, presenting limited curative options. Thus, treatments should focus on symptomatic relief and palliative care. Although bypass surgery is a good surgical palliative treatment for these

patients, it is not an option as many patients are unable to tolerate such a surgery (2). Alternative treatments for palliative decompression of MSBO are essential to relieve abdominal pain and help patients escape intractable vomiting.

Current non-surgical treatments for MSBO consist of a combination of systemic chemotherapy, parenteral nutrition, corticosteroids, antiemetics, antisecretory drugs, opioids, somatostatin, and dexamethasone (3). However, often these interventions do not effectively alleviate symptoms of gastrointestinal distension. Invasive treatment options include intestinal bypass (most common), stent placement, percutaneous needle decompression, and gastric tube placement (4). Of these options, gastric decompression tubes are some of the most effective methods for symptomatic relief in terminal patients with MSBO (1).

Due to drawbacks with percutaneous endoscopic gastrostomy (PEG) tubes and nasogastric (NG) tubes, cervical esophago-gastric (CEG) decompression tubes are emerging as a potential treatment alternative (5). CEG tubes can be placed into the esophagus and stomach through an incision in the neck, avoiding the nasal, sinus, and throat discomfort that many patients experience with NG tubes (6). In contrast, PEG tubes cannot often be placed in patients with MSBO due to surgical risks and the presence of a tumor altering the patient's anatomy (7).

With the goal of establishing the safety and efficacy of CEG tubes, this report reveals important long-term outcomes of percutaneous CEG tube placement in 11 terminal patients with inoperable MSBO. We present this article in accordance with the STROBE reporting checklist (available at https://apm.amegroups.com/article/view/10.21037/apm-24-21/rc).

Highlight box

Key findings

- Cervical esophago-gastric (CEG) tubes are a safe and effective palliative care option for patients with inoperable malignant small bowel obstruction (MSBO).
- Most patients were discharged home after CEG tube placement.
- Most patients were able to tolerate additional chemotherapy after CEG tube placement.
- No conversions to open surgery, reoperations, or mortalities occurred due to CEG tube placement.

What is known and what is new?

- Nasogastric tubes and percutaneous gastrostomy tubes are current methods to relieve gastrointestinal compression in patients with inoperable MSBO. However, nasogastric tubes can be uncomfortable for patients and gastrostomy tubes are often not an option due to placement issues.
- CEG tubes offer a more comfortable alternative to current treatments for abdominal decompression in patients with MSBO.

What is the implication, and what should change now?

- CEG tubes have the potential to significantly improve the quality of life for patients with inoperable MSBO. To implement this solution as a palliative care measure, medical professionals with endoscopic skills should be trained on the procedure for CEG tube placement.

Methods

We retrospectively reviewed patients from 2016–2022 undergoing CEG decompression tube placement for malignant bowel obstruction requiring NG decompression not amenable to PEG tube placement or gastrointestinal bypass operation, as deemed by palliative care teams, gastroenterology, and general surgery services. Tubes were placed percutaneously and endoscopically through the left neck using the guidewire technique. Patients underwent rapid sequence intubation and sedation with propofol and fentanyl. Each patient was positioned in the supine position with neck extension. Esophagoscopy along with ultrasound was used to identify the insertion site 1–2 fingerbreadths above the clavicle anterior to the sternocleidomastoid muscle. The ultrasound was used to identify the internal jugular and carotid arteries as lateral landmarks and the trachea as the medial landmark. A light reflex is often visible in the neck using the flexible esophagoscope. A needle is inserted into the esophagus under esophagoscope visualization, followed by wire insertion into the esophagus into the stomach. A small incision is made at the level of the wire using an 11 blade. The tract is developed using a 22-Fr dilator with a sheath. The 18-Fr decompression tube is inserted through the sheath down into the stomach as confirmed by esophagoscopy. The decompression tube is then sutured to the skin.

The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Houston Methodist Research Institute (HMRI) institutional review board (approval number: PRO00031398) and individual consent for this retrospective analysis was waived.

Results

The demographics and indications of each patient who

Table 1 Patient demographics, cancer types, and comorbidities

Patient	Sex	Age at procedure, years	Cancer type	Major comorbidities
1	Female	69	Ovarian cancer	Endocarditis, mitral valve disorder, pleural effusion, CKD (stage III)
2	Female	69	Stage IV endometrial cancer	UTI, aspiration pneumonia, AKI on CKD stage III, DVT, anemia, pleural effusion
3	Female	40	Metastatic colon cancer	DVT, anemia, ureteral stent, enterovesical fistula
4	Female	31	Stage IV gastric cancer	Subcutaneous & mediastinal emphysema, achalasia
5	Female	57	Mucinous colon adenocarcinoma	Severe sepsis of right chest wall, aspiration pneumonia, GERD, urogenital trichomoniasis
6	Female	69	Mullerian ovarian cancer	Malignant pericardial effusion, DVT, esophagitis, cholelithiasis, anemia
7	Female	60	Primary peritoneal high-grade carcinoma of mullerian origin	GERD, possible aspiration pneumonia
8	Male	67	Cholangiocarcinoma	AKI, sepsis, IVC thrombus, DVT, anemia, type II MI, atherosclerotic disease
9	Male	72	Metastatic colon cancer with peritoneum, lung, and liver cancer	None
10	Male	54	Metastatic colorectal carcinoma	Hypothyroidism, hyperglycemia, ileostomy
11	Male	47	Gastric adenocarcinoma	PE, DVT, GI bleed, diabetes mellitus, HTN, HLD

CKD, chronic kidney disease; UTI, urinary tract infection; AKI, acute kidney injury; DVT, deep vein thrombosis; GERD, gastroesophageal reflux disease; IVC, inferior vena cava; MI, myocardial infarction; PE, pulmonary embolism; GI, gastrointestinal; HTN, hypertension; HLD, hyperlipidemia.

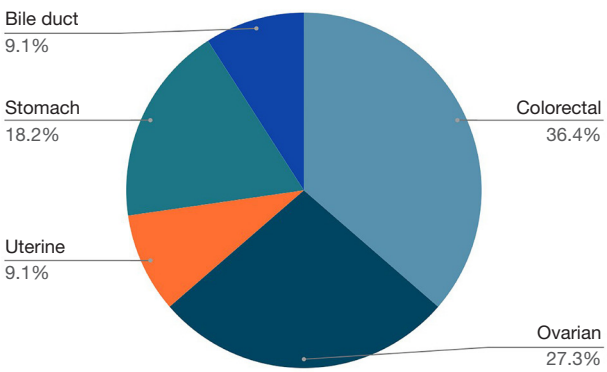

Figure 1 Patient population by abdominal cancer type.

underwent CEG tube placement are outlined in *Table 1*. The average age of the patients at the time of the procedure was approximately 58 years, with an age range of 31 to 72 years. Most patients had either colorectal or ovarian cancer as shown in *Figure 1*.

The patient outcomes following percutaneous CEG tube placement are summarized in *Table 2*, *Figures 2,3*. *Table 2* highlights important metrics regarding the safety of the procedure.

The majority of patients who received CEG tubes had colorectal cancer (36.4%) or ovarian cancer (27.3%). Morbidities (rates) related to the CEG tubes were dislodgement (27%), infection (18%) and gastrointestinal bleeding (18%). Displaced tubes were able to be replaced at bedside. All infections were treated successfully with antibiotics. Gastrointestinal bleeding complications were minor and self-limiting. No one required further surgical intervention or reoperation due to CEG tube placement. None of the CEG tube placement procedures required conversion to open surgery. The 30-day mortality rate after the procedure was 9%. Importantly, no deaths were associated with CEG tube placement.

Data indicating the efficacy of CEG tubes were recorded for the same patients and are displayed in *Figures 2,3*.

Following the procedure, 82% of patients were able to return home, while 45% required readmission. None of the

Table 2 Safety outcomes of cervical esophagogastric tubes by cancer type

Cancer type	No. of patients	Tube dislodgement (%)	Site infection (%)	Bleeding (%)	Reoperation (%)
Colorectal	4 (36%)	25	25	0	0
Ovarian	3 (27%)	33	0	33	0
Uterine	1 (9%)	0	0	0	0
Stomach	2 (18%)	0	0	0	0
Bile duct	1 (9%)	100	100	100	0
All	11 (100%)	27	18	18	0

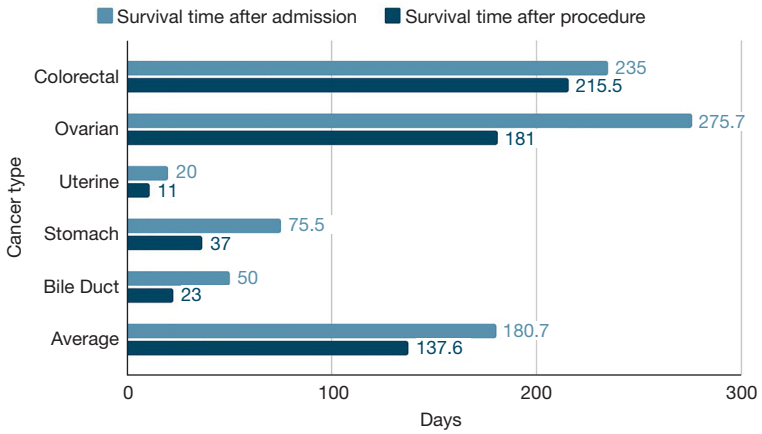

Figure 2 Survival times after admission and procedure by cancer type.

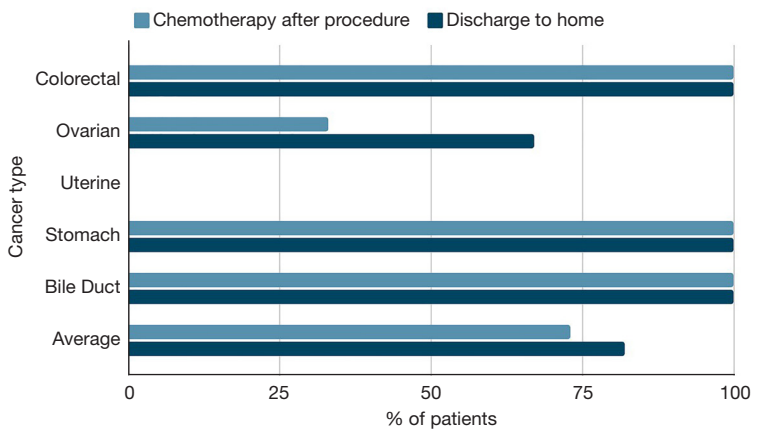

Figure 3 Patients receiving chemotherapy and discharge home by cancer type.

readmissions were linked to CEG tube placement, the tube itself, or any tube-related complications. On average, the patients survived for 180.7 days from their initial admission or diagnosis, with an average post-procedure survival time of approximately 137.6 days. Remarkably, 73% of the patients tolerated further chemotherapy after the procedure.

Interestingly, two patients had their CEG tubes permanently removed after sufficient abdominal decompression and treatment with chemotherapy. One of these patients remains alive without the need for

decompression, and their insertion site healed without any issues. In the other patient, the CEG tube was removed after being used for feeding rather than decompression. One patient had their tube removed after their symptoms improved enough to advance to a regular diet; however, another tube was placed later due to recurrent small bowel obstruction and the second placement was technically more difficult.

Discussion

Malignant bowel obstruction is a difficult condition to manage, and many patients are dissatisfied. Palliative treatment with NG tube decompression can be an effective means; however, vomiting around the tube and persistent abdominal pain are major issues. CEG tubes are placed below the upper esophageal sphincter, which appears to limit vomiting around the tube; however, persistent abdominal pain that can be multifactorial will continue to be an issue for any decompressive measure. For patients who have had good palliation from NG tube decompression, CEG tube is an option for patients who are not candidates for surgical bypass or gastrostomy tubes and want symptomatic relief without the discomfort of a NG tube. At our institution, patients are carefully selected to undergo CEG tube placement on the basis of being palliated by NG tube decompression. Potential candidates are evaluated by general surgery, interventional radiology, and gastroenterology before referral to our service for CEG tube placement. Regarding who can place the CEG tube in patients, we believe that any medical professional with endoscopic skills can become qualified to perform the procedure if trained.

Most patients started chemotherapy 1–2 weeks after the procedure. It appears safe to start chemotherapy two weeks after the procedure. Infection at the tube site was noted in one patient after starting chemotherapy one week after the procedure, which required antibiotic treatment. Pain scores were collected for seven patients before and after CEG tube placement, with six of the seven patients reporting no pain within four days after placement. The average overall reduction in pain was 5.4 points on a scale of 0–10. These outcomes suggest that CEG tubes are effective at reducing pain associated with NG tubes and malignant bowel obstruction.

Although we do not have data on the number of patients with terminal malignant bowel obstruction, it is worth noting that none of the patients in this study regretted their decision to receive a CEG tube.

Conclusions

Based on our experience, CEG tubes appear safe and effective in decompressing malignant bowel obstruction patients requiring NG tubes who are not candidates for palliative gastrostomy tubes or bypass operations. Many patients tolerated additional chemotherapy, and most were discharged from the hospital.

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Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://apm.amegroups.com/article/view/10.21037/apm-24-21/rc

Data Sharing Statement: Available at https://apm.amegroups.com/article/view/10.21037/apm-24-21/dss

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Houston Methodist Research Institute (HMRI) institutional review board (approval number: PRO00031398) and individual consent for this retrospective analysis was waived.

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