Pharyngocutaneous fistula as an alternative access route for inserting a percutaneous endoscopic gastrostomy tube in head and neck cancer patients

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ABSTRACT
Background and study aims Performing a percutaneous endoscopic gastrostomy (PEG) in head and neck cancer (HNC) patients can be challenging because of the presence of trismus, pharyngeal obstruction by tumor, and pharyngoesophageal strictures or fistula. Pharyngocutaneous fistula (PCF) is a major postoperative concern in patients submitted to total laryngectomy (TL). In the medical literature to date, the cervical fistula has been used as an access to PEG in only four reports. The aim of this study was to evaluate the safety of cervical fistula for insertion of a PEG tube.

Patients and methods Retrospective study at a single tertiary referral center, regarding the technical feasibility, safety and outcomes of a PEG tube introduced by a cervical fistula in HNC patients with obstructive lesions of the oropharynx.

Results The procedure was technically successful in all 21 patients. A PEG tube was used for a minimum of 1 month and a maximum of 120 months. Twelve patients died while using the PEG tube, 8 had it taken out because it was no longer needed, and only 1 had the tube still in use. Adverse events occurred in 8 patients: granuloma (19 %), dermatitis (9.5%), accidental late removal of the tube (9.5 %), periprocedural gastric wall hematoma (9.5 %), peristomal wound infection (4.7 %), buried bumper syndrome (4.7 %), and traumatic gastric ulcer (4.7%).

Conclusion A postoperative cervical fistula can successfully work as a reliable and safe access for a PEG tube procedure in HNC patients, avoiding unnecessary surgery and reducing costs.

Introduction
Nutritional support is a critical point in the care of patients with advanced cancer. In general, patients with malignancies suffer malnutrition from tumor burden and/or anorexia. Head and neck cancer (HNC) patients have additional problems because swallowing disorders are caused by pharyngeal strictures, fistula, and damage to the pharyngeal musculature resulting from the tumor, radiation therapy, or surgical procedure. Nevertheless, the gastrointestinal tract in these individuals usually is intact, making them fit for enteral nutrition. In these patients, nourishment can be administered through nasoenteric tubes or gastrostomy tubes placed by endoscopy, radioscopy or laparotomy [1, 2].

In 1980, Gauderer et al. first described insertion of a percutaneous gastrostomy tube under local anesthesia using endoscopy, in a child [3]. A percutaneous endoscopic gastrostomy (PEG) tube has rapidly become the most widely used method for long-term feeding, because it is safer and more cost-effec-
phagostomy can be used to introduce the endoscope.

tula (frequent treatment sequelae in these patients) or an eso-

Passing a local stricture or a trismus, a postoperative cervical fis-

ment failures in HNC patients [1, 7]. In some clinical scenarios

obstruction accounted for 20% to 75% of all PEG tube place-

dilatation [1]. In different reports, upper aerodigestive tract

sources and find different ways to bypass the technical and

anatomic limitations. Regarding the strictures, maneuvers that

allow PEG tube placement in these patients include the selec-

tion of a small-caliber endoscope and pharyngoesophageal
dilatation [1]. In different reports, upper aerodigestive tract

obstruction accounted for 20% to 75% of all PEG tube place-

ment failures in HNC patients [1, 7]. In some clinical scenarios

with surgical HNC patients, if an endoscopist is unable to by-

pass a local stricture or a trismus, a postoperative cervical fis-

(treatment sequelae in these patients) or an esoph-

phagostomy can be used to introduce the endoscope.

Pharyngocutaneous fistula (PCF) is a major post-treatment

concern in patients who undergo total laryngectomy (TL). The

reported incidence of PCF following TL for laryngeal cancer

ranges from 2.6% to 65.5% [8]. The fistula may be secondary

to impaired wound healing, persistent distal obstruction to sali-

vary flow, technical difficulties during pharyngoplasty or local

tissue ischemic necrosis, which general occurs within the first

few postoperative days [9, 10].

The first time an esophagocutaneous fistula was used for ac-

tess to insert a PEG tube was reported by Hunter et al. in 1989

[1], when they described 1 case among 50 successful PEGs in

HNC patients. Since then, only a few reports have been

described in the medical literature. Our aim was to report our

experience with use of a postoperative cervical fistula as an al-

ternative access route for PEG tube placement in HNC patients

with obstructive lesions of the oropharyngeal region.

Patients and methods

Study design

Retrospective review of prospectively collected clinical data,
presented as a case series of consecutive HNC patients under-

going PEG done through a post-treatment cervical fistula or

stoma, conducted at the Department of Digestive Endoscopy

of the Brazilian National Cancer Institute (INCA), a federal gov-

ernment tertiary referral center, at Rio de Janeiro, Brazil.

Clinical and demographic data on the patients, adverse

events (AEs), and patient outcomes were recorded in an Excel

spreadsheet (Microsoft Corp., Redmond, Washington, United

States) during long-term follow-up.

This study protocol was approved by the INCA Institutional

Review Board (CEP/INCA Number 1706). Informed consent

was obtained from all patients.

Study population

From January 2002 to December 2014, 1305 PEG procedures

were done in HNC patients at our institution. Of them, 21 PEG

procedures were performed in the same number of adult HNC

patients with obstructive lesions of the oral cavity or hypophar-

ynyx by inserting the endoscope and PEG tube directly through a

cervical fistula or stoma.

Operative technique

Prophylactic intravenous cephalolin (2g) was given to all pa-

tients 30 minutes before the procedure. Under pulse oximetry

continuous monitoring and conscious sedation with intrave-

rous midazolam and meperidine, a standard-diameter or pe-

diatric gastroesophagoscope was inserted through the cervical

(pharyngo or esophagocutaneous) fistula, and the upper gas-

trointestinal tract was thoroughly examined via endoscopy.

PEG was performed using the "pull" method (Gauderer-Ponsky

technique) using commercially available kits (PEG 24-Pull-S,

Cook Medical, Winston-Salem, North Carolina, United States;

MIC PEG 24Fr, Ballard Medical Products, Draper, Utah, United

States; and EndoVive PEG 24Fr, Boston Scientific Corporation,

Natick, Massachusetts, United States).

Follow-up

Following the institutional post-PEG protocol, patients returned

for regular visits at scheduled intervals (on post-procedure days

2 and 7, and then monthly) during the period of PEG use, until

the tube was removed or the patient died.

Definition of adverse events

AEs were considered minor when they occurred simple or ambu-

latory care (late dislodged tube, peristomal leak, wound infec-

tion, granuloma formation, minor wound bleeding or small

hematoma). Major AEs included peritonitis, buried bumper syn-

drome (BBS), septicemia, aspiration pneumonia, hemorrhage,

gastric perforation, gastrocolocutaneous fistula and any AEs re-

quiring a repeat procedure, surgical or endoscopic treatment,

or blood transfusion [11].

Results

Results are summarized in Table 1.

A standard-diameter or pediatric gastroesophagoscope was

passed through a cervical fistula or stoma and a pull-technique

PEG was performed in a total of 21 HNC patients (3 female and

18 male). The age of patients varied from 34 to 84 years (mean

59 years).

Eighteen (85.7%) patients had laryngeal cancer, 2 (9.5%)

had oropharyngeal cancer, and 1 (4.7%) had hypopharyngeal

cancer. All of them had undergone a radical surgical procedure

(2 had a combined mandibulectomy and neck dissection opera-

tion [COMMANDO surgery], and 19 had a total laryngectomy). Four

(19%) of those patients had complementary treatment with

chemotherapy and radiation therapy, and 9 (42.8%) had

radiation therapy alone.
PEG was performed as an outpatient procedure (ambulatory setting, without hospitalization) in 8 (38.1%) of 21 patients. Preprocedure endoscopic dilation of a fibrotic and narrowed esophageal opening (with a Savary bougie or a hydrostatic balloon) was necessary for 3 (14.3%) patients, to allow advancement of the endoscope.

Eight patients (38.1%) presented with PEG complications, with more than one event per patient in 4 cases (1 patient with 3 different complications and 3 patients with 2 complications each), for a total of 13 AEs: granuloma formation (4 cases; 19%), dermatitis (2 cases; 9.5%), accidental late removal of the tube (2 cases; 9.5%), periprocedural gastric wall hematoma (2 cases; 9.5%), peristomal wound infection (1 case; 4.8%), BBS (1 case; 4.8%), traumatic gastric ulcer (1 case; 4.8%). The rate of major AEs was 4.8% (1 patient) and minor AEs was 38.1% (8 patients). There were no fatalities related to the PEG procedure.

In the follow-up, a PEG tube was used for a minimum of 1 month and a maximum of 120 months (mean of 17.9 months). Of all the patients, 12 (57.1%) died while using the PEG tube, 8 (38.1%) had the PEG tube taken out because it was no longer needed, and only 1 (4.8%) had the tube still in use.

Discussion
Numerous techniques are currently available for inserting a PEG tube in difficult HNC patients [12, 13]. The route for introducing the endoscope into the stomach is one of the crucial points of the procedure. In most cases, peroral gastroscopy and pull-technique PEG placement are easy and safe. However, in the presence of severe trismus, tumor obstruction, or post-treatment anatomic changes, the procedure may become impractical. Introducer PEG technique by transnasal approach with ultrathin endoscopes, rigid laryngoscopic guidance, radiologic percutaneous gastrostomy (RPG), transmaxillary approach, intraoperative procedures (surgically opened pharynx region), and open surgical gastrostomy must be considered to insert a G-tube successfully in these difficult cases [12, 13]. To avoid a surgical procedure, an existing cervical fistula or ostomy may be used to provide access to the PEG tube, if the procedure cannot be performed transorally [1, 14, 15].

For the 21 HNC patients included in this case series, there were 2 main indications for the introduction of the endoscope directly through a cervical fistula or stoma. The first (and more frequent indication) was the finding of a tumoral or cicatricial obstruction of the oral cavity or hypopharynx region that precluded tube progression. The second reason was the presence of an extensive anterior cervical wall defect that resulted in complete exteriorization of the endoscope tube after the transposition of the hypopharynx (Fig. 1). In the latter situation, even it was possible to advance the tube, introduction of the endoscope through the mouth would result in an unnecessary maneuver and pose an elevated risk of contamination of the PEG tube, which could result in a higher rate of peristomal infection. In the majority of cases, the two situations were present simultaneously.

Until today, only 4 reports in the medical literature have described use of cervical access (by a preexisting fistula or stoma) to perform a PEG in HNC patients [1, 14–16].

Hunter et al. reported the first description of PEG tube insertion through a cervical fistula in 1989 [1]. At that time, they presented the experience of performing PEG in 50 patients
with advanced oropharyngeal cancer, using a pull-through PEG technique. In one of the patients they used an esophago-cutaneous fistula as an access via to inserting the PEG tube.

In 2001, Lujber et al. described a 59-year-old patient with a squamous cell carcinoma of the left piriform sinus who had radiation and surgical treatment [14]. Two weeks after the operation, formation of fistula began in the neck. Since the oral route could not be used because of extensive irradiation-induced fibrosis and the postoperative narrowing lumen of the remaining hypopharynx, the fistula seemed the best way to access the stomach. Unlike our patients, who underwent PEG under conscious sedation, the procedure in Lujber et al.’s study was done under general anesthesia. Insertion of an 18 Fr PEG tube insertion through the orifice of the fistulae was successful. No major or minor AEs occurred during or after the procedure. The PEG tube was removed 4 months later. The patient had no tumor recurrence or other problems during the 24-month follow-up period.

In 2006, Lujber described 3 other cases of PEG tube insertion through a cervical fistula [15]. In all cases, the pull-type PEG technique was used. Only 1 patient had the procedure done under general anesthesia, the other 2 had local anesthesia. No immediate or long-term AEs were noted.

In a report of PEG as an outpatient procedure in HNC patients, Mello et al. used cervical fistula and pharyngoesophageal stomyes as the access route for introducing the endoscope and the PEG tube in 6 (4.6%) of a total of 136 patients [16].

In all mentioned cases above, a pharyngoesophageal fistula was used to access the stomach lumen, and a pull-technique PEG was successfully performed. As seen, this procedure can be done using general anesthesia or intravenous conscious sedation.

All of our procedures were safely done with pull-type PEG kits (Gauderer-Ponsky method), at the endoscopy room and under conscious intravenous sedation (avoiding unnecessary general anesthesia and mechanical ventilation). In almost 40% of cases, PEG was performed as an outpatient procedure, in the ambulatory setting. At our institution, both introducer-type PEG technique (Russell method) and RPG were only regularly available after 2012.

Lujber et al. and Lujber had no AEs in any of their 4 procedures [14, 15]. Hunter et al. had AEs events classified as minor without further specifications [1]. In our report, only one major AE (a buried bumper syndrome) was seen, all other AEs were classified as minor. No patient died from the PEG procedure. Some authors reported a total AE rate of 37% to 40% in HNC patients submitted to PEG [17–20]. A systematic review of PEG in HNC patients reported minor AEs in 171 (13.3%) of 1281 procedures and major AEs in 60 (4.6%) [11]. Mortality occurred in 10 (0.8%) patients. Compared to PEG literature in HNC patients, our AEs occurred at the expected frequency, regardless of the relationship to or influence of introduction of the endoscope and/or PEG tube through the cervical fistula.
Conclusion
When dealing with HNC patients, the PEG procedure can be a challenge due to obstructive lesions or trismus. This report registers that a pharyngoesophagocutaneous fistula, a frequent post-treatment AE in these patients, can successfully be used as a reliable and safe access route to PEG tube introduction, avoiding unnecessary surgery and reducing costs.

Competing interests
None

References