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Safety of Outpatient vs Inpatient Percutaneous Radiological Gastrostomy Tubes in Patients with Head and Neck Cancers

Devang Odedra, MASc^{a,b}, Reza Nasirzadeh, MD, FRCPC^{a,c}, Alexandre Menard, MD, FRCPC^{a,c,*}^aDepartment of Diagnostic Imaging, Kingston General Hospital, Kingston, Ontario, Canada^bSchool of Medicine, Queen's University, Kingston, Ontario, Canada^cDepartment of Diagnostic Imaging, Queen's University, Kingston, Ontario, Canada

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Percutaneous radiological gastrostomy (PRG) has been shown to provide a similar success rate as percutaneous endoscopic gastrostomy (PEG), with potential benefits of increased patient convenience and decreased procedure times and equipment costs [1-3]. PRG is an especially viable option for nutrition support in patients with head and neck cancer who are symptomatic or prophylactically for anticipated dysphagia due to radiation therapy [4-6].

PRG has traditionally been performed as an inpatient (IP) procedure with an overnight stay, similar to PEG. While the feasibility and efficacy of PEG have been investigated as an outpatient (OP) procedure [7], to our knowledge the literature is limited for PRG. OP procedures are often preferred by the patients, and can lead to significant savings and decrease the financial burden on healthcare.

The purpose of this retrospective study was to investigate the success and complication rates of PRG as an OP procedure versus IP procedure in head and neck cancer patients. We hypothesized that PRG can be successfully performed in an OP setting with comparable success and complication rates to an IP setting. Specifically, the 15-day mortality, 15-day early complications, 6-month minor complications, and 6-month major complications were compared between the 2 settings.

Methodology

Study Design and Population

Following institutional research ethics board approvals, the electronic medical records of all head and neck cancer patients who underwent PRG from January 2010 to June 2013 were reviewed. In total, 50 OPs and 51 IPs underwent 101 gastrostomy procedures.

The OPs were transferred post procedure to the Outpatient Procedure Unit, where the medical or radiation oncology service physician assessed them. If approved by the caring physician, the patient was discharged home to return to the cancer centre the following morning. They were at that time assessed by the integrated cancer team (medical oncology, radiation oncology, and dietician). The IPs were admitted prior to the procedure and observed overnight following the procedure. The enteral feeds were started in consultation with a registered dietician the next day, if so required.

Previous to 2012, all PRGs in head and neck cancer patients were inserted as IPs. In early 2012, the practice at our hospital transitioned into a predominantly OP PRG insertion for head and neck cancer patients.

Data Collection

Demographical data including age, gender, diabetes status, symptomatic vs prophylactic status, type and stage of cancer were recorded. Symptomatic status refers to the indication for G-tube placement due to symptoms of dysphagia, whereas prophylactic status refers to the prophylactic placement of

* Address for correspondence: Alexandre Menard, MD, FRCPC, Department of Diagnostic Imaging, Kingston General Hospital, 76 Stuart St, Kingston, Ontario K7L 2V7, Canada.

E-mail address: menard_alex@me.com (A. Menard).

G-tube against possible dysphagia during the course of the radiation therapy. Procedure notes and clinic notes were reviewed in order to record any complications. Complications were categorized into minor or major, as described in Table 1. Any complication necessitating procedural intervention was classified as major. Complications were further classified as early if they occurred within 15 days of the procedure.

Inclusion and Exclusion Criteria

Patients with head and neck cancer who underwent PRG were included in the study. Patients with prior gastrostomy tube insertion were excluded.

Operative Technique

All procedures were performed by 1 of 3 fellowship trained interventional radiologists.

The patient ingested 125 mL of Polibar plus barium solution (Bracco Imaging, Milan) 12 to 16 hours before the procedure. Alternatively, the barium solution was given via nasogastric tube. Preprocedure sonographic examination of the abdomen was performed for left liver edge localization. Gastric insufflation was achieved via an existing nasogastric tube or by advancing a 5-F KMP catheter (Cook Medical, Bloomington, IN) into the stomach under fluoroscopic guidance via nasal approach. The abdomen was prepped and draped in a sterile fashion. Local anesthesia was administered to the abdominal wall. Conscious sedation was administered using a combination of intravenous midazolam and fentanyl.

The access site was localized via fluoroscopic examination of the insufflated stomach. Depending on operator preference, 1 or 2 T-fastener gastropexy sutures (Cook Medical) were placed percutaneously to bring the anterior stomach wall into contact with the anterior abdominal wall. An 18-gauge needle was used to access the gastric lumen. Placement was confirmed with air aspiration and contrast injection. A 0.035 Amplatz guidewire (Boston Scientific, Natick, MA) was advanced through the needle into the stomach, the needle was withdrawn and the tract dilated. A 12-F Wills-Oglesby gastrostomy tube (Cook Medical) was advanced into the stomach over the wire and the wire was withdrawn. The pigtail locking mechanism was deployed and contrast was injected via the tube for final placement confirmation. Catheters were fixated to the skin with a Stat-Lock device (Bard Medical, Covington, GA). Prophylactic antibiotics were not administered.

Table 1
Minor and major complications

| Minor | Major |
|--|---|
| <ul style="list-style-type: none"> • Superficial infection • External leakage – (not requiring repeat procedure) • Pain (transient) • Tube blockage or dislodgement (not requiring repeat procedure) | <ul style="list-style-type: none"> • Deep infection/bacteremia • External leakage (requiring repeat procedure) • Pain (persistent) • Tube blockage or dislodgement (requiring repeat procedure) • Aspiration • Peritoneal leakage |

For IPs, tubes were not used for 24 hours following placement. Physician assessment for signs of peritonitis was performed before initiation of G-tube feeds. For OP procedures, the patient recovered in a monitored area for 4–6 hours. One liter of normal saline was infused intravenously over 4 hours to ensure proper hydration. The patient was discharged home after physician examination and returned to hospital the following morning for repeat physician assessment before initiation of oral or G-tube feeds.

Statistical Analysis

All the data was inserted in Microsoft Excel (Microsoft Corporation, Redmond, WA). Statistical analysis was performed using SPSS software v13.0 (SPSS Inc., Chicago, IL). The statistical analysis was performed in consultation with a statistician with an expertise in clinical research. The correlation of the clinical and demographic variables was assessed with a chi-square test. Results were considered statistically significant if $P \leq .05$.

Results

Patients

The patient characteristics are provided in Table 2. There were 51 and 50 patients in the IP and OP groups, respectively. The mean ages in IP and OP groups were 66.0 ± 11.4 years and 61.3 ± 12.9 years, respectively ($P = .053$). Eight patients in the IP group and 5 patients in the OP group were previously diagnosed with diabetes. More patients in the IP group were symptomatic at the time of the procedure compared to OP group (31 in IP vs 15 in OP groups, $P < .05$). The most common stage of malignancy was IVa, with 60.4% and 66.0% of patients having stage IVa disease in IP and OP groups, respectively. The breakdown for the origin of the head and neck malignancies is provided in Table 3. The most common primary malignancy was oropharyngeal cancer seen in 56.9% of IPs and 76% of the OP population.

Complications

The types and rates of the complications are presented in Table 4. Overall, the total number of complications was

Table 2
Patient demographics and cancer stage

| Characteristic | Inpatient n = 51 | Outpatient n = 50 | P value |
|--------------------------|---------------------|----------------------|---------|
| Age | 66.0 ± 11.4 | 61.3 ± 12.9 | .053 |
| Sex male | 36 (70.6) | 45 (90.0) | .014 |
| Diabetes | 8 (15.7) | 5 (10.0) | .394 |
| Symptomatic ^a | 31 (60.8) | 15 (30.0) | .002 |
| Stage II | 3 (6.3) | 1 (2.0) | .161 |
| III | 4 (8.3) | 8 (16.0) | |
| IVa | 29 (60.4) | 33 (66.0) | |
| IVb | 4 (8.3) | 6 (12.0) | |
| IVc | 8 (16.7) | 2 (4.0) | |

Values are mean \pm SD or n (%).

^a Symptoms of dysphagia related to head and neck cancer.

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