Complications of Percutaneous Endoscopic Gastrostomy in Patients with Head and Neck Cancer

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Introduction

- Percutaneous endoscopic gastrostomy (PEG) is the most commonly performed method of durable enteral access; a necessity often found in patients with head and neck cancer (HNC).
- Although PEG placement is a minimally invasive procedure, approximately 8-30% of patients experience immediate or delayed complications.[1-3]
- Serious complications have been reported in 0.4-4.4% of the procedures, including peristomal leakage with peritonitis, gastric bleeding, injury to visceral organs, and tumor seeding at the PEG site.[4-5]
- Patients with HNC may have inherently higher risks due to their immunocompromised state and comorbid conditions such as tobacco abuse.
- This study compares PEG placement in HNC patients with non-HNC patients to identify patient or disease-related factors associated with complications.

Methods and Materials

- An institutional review board approved retrospective evaluation was performed of adult patients undergoing PEG for HNC at an academic medical center from September 2004 to February 2020.
- Preoperative risk factors, cancer characteristics, operative details, and postoperative and long-term outcomes were collected via electronic medical records.
- Complication rates in HNC patients were subsequently compared to a previously collected dataset of non-HNC patients using a two-sample t-test.
- Patient risk factors and cancer characteristics were analyzed for association using a univariate model.
- Multivariable logistic regression was performed to evaluate the likelihood of developing a complication while controlling for covariates

Table 2. Logistic Regression for Factors Associated with PEG Tube Complications

		OR	Lower 95% CI	Upper 95% CI	p-value
Age	<50	reference			
	51-65	1.852	0.622	5.515	0.328
	66-74	1.593	0.499	5.081	0.678
	>75	1.261	0.233	6.819	0.860
BMI	Underweight (<18.5)	reference			
	Normal (18.5-24.9)	0.166	0.061	0.457	**0.018**
	Overweight (25-29.9)	0.207	0.069	0.619	0.129
	Obese (30+)	0.419	0.149	1.180	0.535
Sex	Male	reference			
	Female	1.612	0.696	3.730	0.265
Smoking history	No	reference			
	Yes	0.907	0.398	2.067	0.817
Cardiac history	No	reference			
	Yes	1.574	0.747	3.315	0.233
Diabetes	No	reference			
	Yes	0.802	0.317	2.032	0.642
COPD	No	reference			
	Yes	0.784	0.301	2.043	0.619
ASA Class	1 or 2	reference			
	3+	1.003	0.427	2.353	0.995
PEG timing	Prophylactic	reference			
	Symptomatic	1.089	0.522	2.270	0.820

Table 3. Logistic Regression for Select Factors Associated with PEG Tube Removal

		OR	Lower 95% CI	Upper 95% CI	p-value
Age	<50	reference			
	51-65	1.259	0.481	3.295	**0.005**
	66-74	0.614	0.220	1.707	0.463
	>75	0.061	0.006	0.596	**0.014**
BMI	Underweight (<18.5)	reference			
	Normal (18.5-24.9)	0.837	0.307	2.279	0.147
	Overweight (25-29.9)	0.899	0.307	2.633	0.276
	Obese (30+)	3.194	0.934	10.921	**0.009**
ASA Class	1 or 2	reference			
	3+	0.408	0.180	0.924	**0.032**
PEG timing	Prophylactic	reference			
	During CRT	0.713	0.182	2.786	0.735
	After symptoms	0.320	0.150	0.681	**0.036**

Results

- A total of 223 patients with HNC undergoing PEG met inclusion criteria (mean age 59 years, 80.7% male).
- Squamous cell carcinoma was the most common diagnosis (n=201, 90.1%) with majority Stage 4, (n=131, 58.7%). Most patients (n = 214, 95.9%) had at least one comorbidity beyond their HNC.
- Overall, 46 (20.6%) patients had complications, including 19 (8.52%) surgical site infections and 10 (4.48%) PEG dislodgments. Nine patients (4.04%) required reoperation for PEG-related complications, but there were no mortalities.
- When compared to historical dataset of 420 patients undergoing PEG for non-HNC indications, patients with HNC had a statistically higher rate of complications (20.6 vs 12.9 %, p=0.0097).
- Multivariable analysis
  - Patients with a normal BMI (18.5-24.9) were less likely to develop a complication when compared to underweight patients (OR 0.166, p-value= 0.018)
  - Patients 75 years or older (OR 0.061, p-value=0.014) and an ASA classification of 3 or higher (OR 0.408, p-value=0.032), were less likely to undergo PEG tube removal when compared to individuals 50 years or younger and ASA <3, respectively.
  - When compared to patients who underwent prophylactic PEG placement, patients who underwent PEG placement after developing symptoms were less likely to undergo PEG removal (OR 0.320, p-value=0.036).
  - Obese patients were more likely to undergo PEG tube removal when compared to underweight patients (OR 3.194, p-value 0.009).

Conclusion

- Patients with HNC had a higher rate of complications following PEG than a cohort of non-HNC patients.
- Patients with a normal BMI were less likely to develop complications. There were no significant associations between complications and the following patient and cancer characteristics: age, sex, smoking, cardiac, diabetes, COPD, ASA classification, pathologic staging, timing of CRT, and timing of PEG.
- When considering the timing of PEG placement in HNC patients, patient- and disease-related risk factors should not deter their consideration for the procedure while prolonging enteral access may even be a detriment.

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