

# Pre-Surgical Risk Factors of Nasogastric Tube Failure Following Oral Cancer Resection

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## Introduction

### Enteral Feeding After OSCC Resection

• **Oral Squamous Cell Carcinoma (OSCC)** are common and aggressive oral cavity tumors that often require extensive resection and reconstruction.<sup>1</sup>

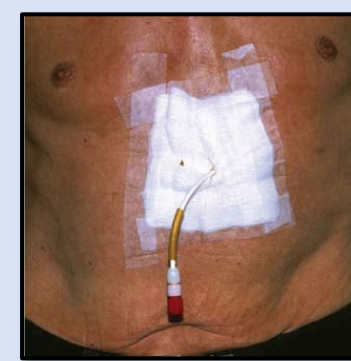
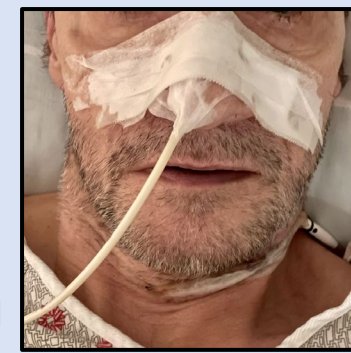


• Following surgery, oral intake is restricted, thus necessitating alternative nutrition methods —most commonly enteral tube feeding.<sup>1</sup>

• **Nasogastric tube (NGT)** is used for short-term feeding (<4 weeks). Patients are considered to have failed NGT if they cannot resume oral feeding in this time frame.

• **Percutaneous endoscopic gastrostomy (PEG)** tube feeding is necessary for patients in need of long-term nutritional support including those that fail NGT. However, PEG requires additional surgery and management compared to NGT.<sup>2</sup>

• **Without defined risk factors, choice of initial enteral tube feeding is surgeon preference.**



## Methods

### Design

- We performed a retrospective cohort study to identify risk factors for NGT failure, i.e. post-operative conversion from NGT to PEG.
- We identified n=81 patients from 2015-2022 who received NGT following OSCC resection at Roswell Park CCC.
- Comparisons were performed between patients who received NGT alone (NGT group, n=53) and patients who failed NGT, indicated by PEG insertion following NGT (NGT+PEG group, n=28).

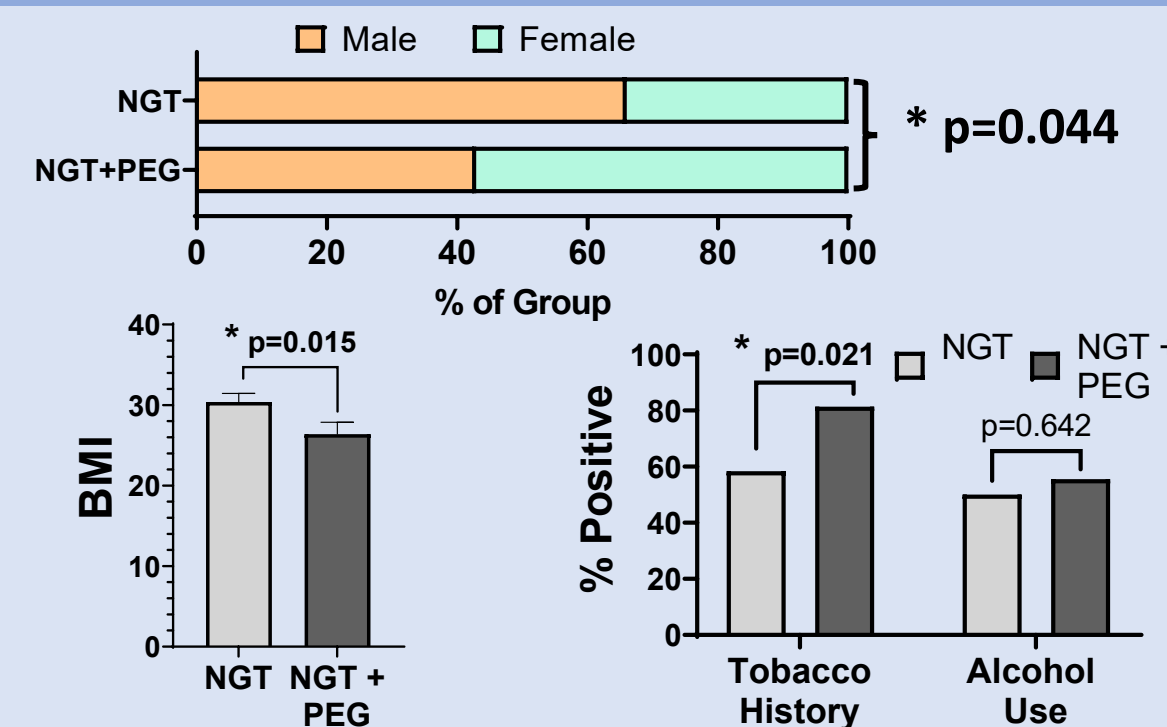
### Patient Demographics

NGT Status – n (%)	Gender – n (%)	Mean Age at Surgery (SD; Range)	Race – n (%)
NGT Only - 53 (65.4%)	Male - 47 (58.0%)	63.3 (13.3; 18-87)	White – 80 (97.6%)
NGT+PEG - 28 (34.6%)	Female – 34 (42.0%)		Black – 1 (1.2%)
			Asian – 1 (1.2%)

### Statistics

- Nominal variables were compared used Pearson Chi-Square.
- Ordinal variables were compared using Kendall's Tau.
- Group means were compared using student's t-test.
- Predictive models were calculated using multinomial logistic regression. Models with lowest AIC were selected
- Comparisons were performed using IBM SPSS v 29.0.0.0.

### Sex, BMI, and Use of Tobacco Influence NGT Failure

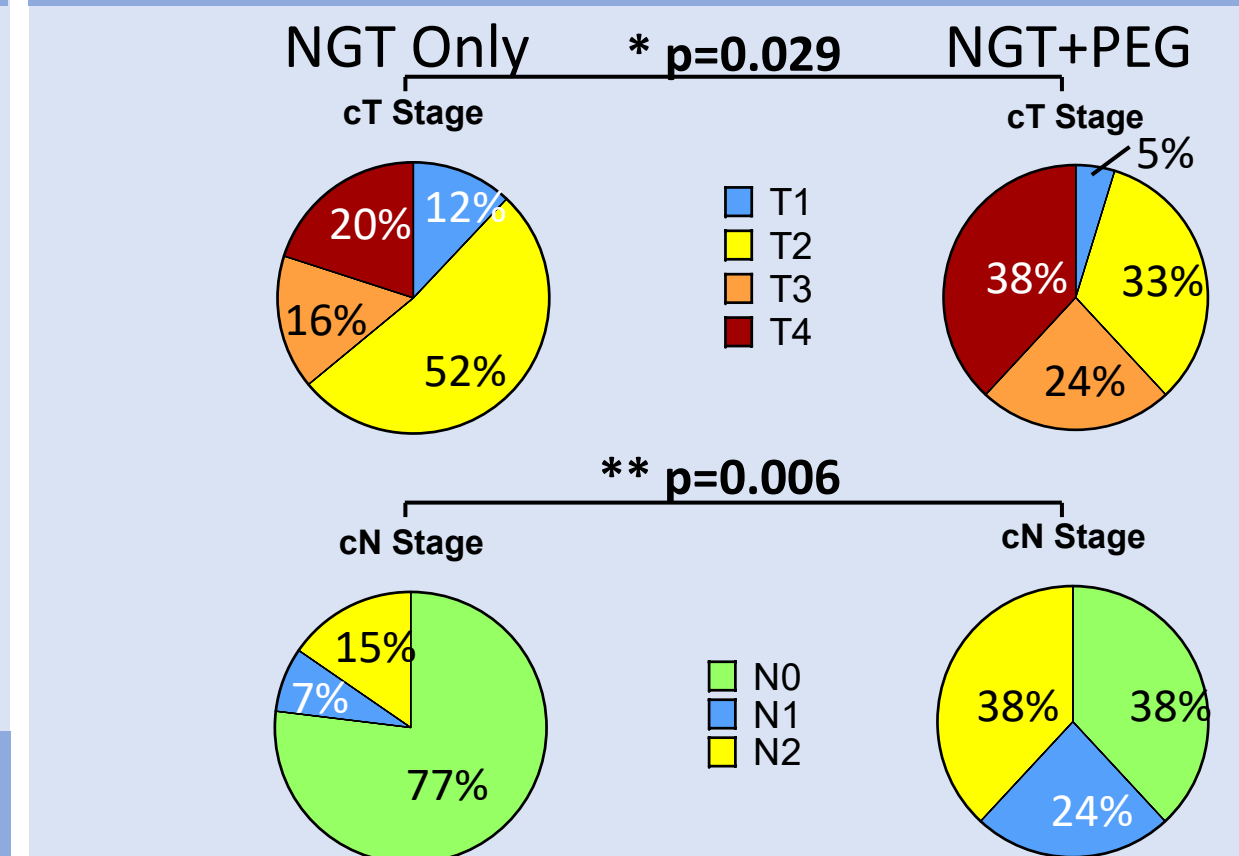


### The Influence of Comorbidities on NGT Failure

Comorbidity	Patient, No. (% of group)		
	NGT Only	NGT+PEG	p-value
Dysphagia	11 (20.8)	8 (37.1)	0.328
Difficulty Tolerating Oral Feed	18 (34.0)	18 (69.2)	0.002
Pre-operative Oral Pain	28 (53.8)	22 (78.6)	0.019
Presence of Co-morbidity	10 (18.9)	1 (3.7)	0.021
Depression or Anxiety	3 (5.7)	8 (29.6)	0.012
Type 2 Diabetes	14 (26.4)	1 (3.8)	0.002
Hypertension	29 (54.7)	18 (66.7)	0.294
Hypothyroidism	6 (11.3)	9 (33.3)	0.031
Chronic Cardiovascular Disease	33 (62.3)	19 (70.4)	0.472
Chronic Pulmonary Disease	5 (9.4)	7 (25.9)	0.08
Chronic Gastrointestinal Disease	8 (15.1)	5 (19.5)	0.702

## Results

### Higher Cancer Stages and Tumor Volume Can Help Predict NGT Failure



Variable	Mean (SD)		p-value
	NGT Only	NGT+PEG	
Tumor Volume (cm <sup>3</sup> )	4.3 (5.9)	11.4 (20.7)	0.026
Depth of Invasion (mm)	8.5 (4.6)	14.1 (5.5)	<0.001
Resection Volume (cm <sup>3</sup> )	56.6 (45.2)	91.2 (90.1)	0.014

### Predicting NGT Failure: Patient Factor-Driven Models

Variables Included in Models	AUC (c-statistic)	AUC 95% Confidence Interval
Difficulty Tolerating Oral Feed, Tumor Volume, Tobacco Use	0.85	0.708-0.992
Difficulty Tolerating Oral Feed, Tumor Volume, BMI	0.842	0.691-0.992
Difficulty Tolerating Oral Feed, Tumor Volume, Mood / Anxiety Disorder	0.842	0.6892-0.994

## Discussion and Conclusion

- ❑ We identified pre-operative patient risk factors including lower BMI, female sex, difficulty tolerating oral feed, pre-operative pain, current tobacco use, anxiety or depression, and hypothyroidism.
- ❑ Patients with OSCC of higher clinical stage and greater tumor and surgical dimensions were significantly more likely to fail NGT.
- ❑ Presentation with difficulty tolerating oral feed with high tumor volume in addition to tobacco use, low BMI, or mood/anxiety disorder may predict NGT failure.
- ❑ Future analysis will seek to apply and expand these predictive models for stratifying risk of NGT failure in OSCC patients.

## References

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2. Nugent B, Lewis S, O'Sullivan JM. Enteral feeding methods for nutritional management in patients with head and neck cancers being treated with radiotherapy and/or chemotherapy. *Cochrane Database Syst Rev.* 2013;2013(1):CD007904. Published 2013 Jan 31. doi:10.1002/14651858.CD007904.pub3