Predictors of Tracheostomy in Patients Undergoing Upper Aerodigestive Tract Reconstruction by Free Flap

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OBJECTIVES

- Identify predictors of tracheostomy in patients undergoing aerodigestive tract reconstruction with a free flap following cancer resection surgery
- Quantify complications and adverse events in patients undergoing aerodigestive tract reconstruction

INTRODUCTION

- Patients are at risk for postoperative upper airway obstruction after aerodigestive reconstructive surgery[1]
- High risk patients must be managed by elective tracheostomy or remain intubated and transferred to the ICU[2]
- Tracheostomy reduces risk of upper airway obstruction[3]
- May lead to decreased quality of life[4]
- Available scoring systems for tracheostomy have been shown to be inadequate for predicting which patients will undergo tracheostomy[5]

METHODS

- Retrospective cohort study
- 85 patients included (70 with tracheostomy and 15 without)
- Patients included if undergoing aerodigestive reconstructive surgery with free flap from 2016 to 2021 at Ben Taub Hospital in Houston, Texas
- Patients excluded if their procedure was a total laryngectomy or a cutaneous reconstruction that did not involve the aerodigestive tract
- Univariate statistical analyses were conducted to evaluate for predictors of tracheostomy and study outcome measures

RESULTS

Table 1: Demographics and Characteristics of Participants

	# of Participants with Outcome (%)		
	Tracheostomy	No Tracheostomy	p-value
Male	57 (81)	11 (73)	0.487
Female	13 (19)	4 (27)	0.487
Caucasian	25 (36)	3 (20)	
Black	18 (26)	4 (27)	0.290
Hispanic	23 (33)	6 (40)	0.309
Asian	3 (4.3)	2 (13)	0.119
Other	1 (1.4)	0 (0.0)	0.993
	Mean (SD)		
	Tracheostomy	No Tracheostomy	p-value
Age (years)	54.6 (10.7)	46.6 (15.3)	0.0710
BMI (kg/m^2)	25.1 (5.38)	24.8 (3.49)	0.779
Hospital Stay (Days)	14.2 (15.6)	8.73 (3.24)	0.00994

Table 2: Predictors of Tracheostomy

	# of Participants with Outcome (%)		
	Tracheostomy	No Tracheostomy	p-value
Cigarette Use	46 (66)	5 (33)	0.0218
Mandible Involvement	39 (56)	4 (27)	0.038375
Neck Dissection:			
Unilateral	34 (49)	3 (20)	0.000746
Bilateral	32 (45)	2 (13)	0.000851

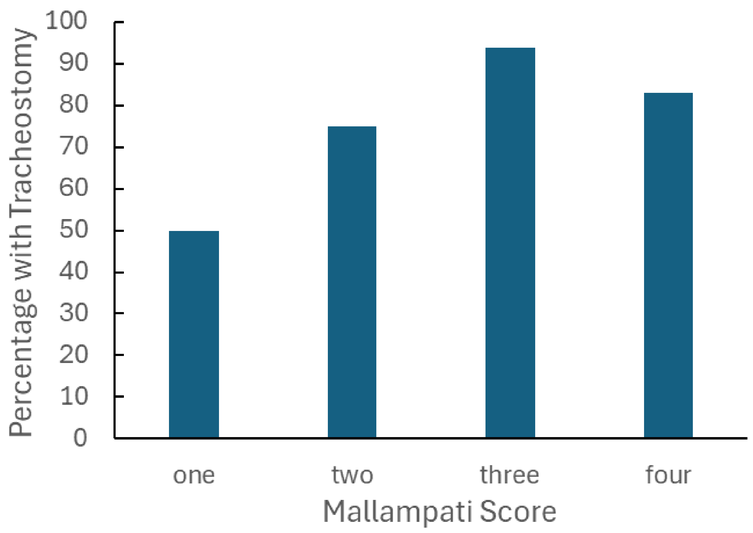

Figure 1: Preoperative Mallampati score was positively associated with the percentage of tracheostomies being included in aerodigestive tract reconstruction surgery (p = 0.0351; 95% CI of 1.17-14.0).

Table 3: Complication Rates by Tracheostomy Status

	# of Participants with Outcome (%)		
	Tracheostomy	No Tracheostomy	p-value
Return to OR (30 days)	14 (20)	2 (13)	0.427
ED Visits (30 days)	28 (40)	2 (13)	0.0731
Pneumonia (30 days)	11 (16)	1 (6.7)	0.683
Flap Failure	5 (7.1)	0 (0)	0.580

Table 4: Tracheostomy Specific Complication Rates

	# of Participants with Outcome (%)
Mucus Plugs	11 (16)
Bleeding	7 (10)
Premature Decannulation	5 (7.1)
False Passage	2 (2.9)
Delayed Tracheostomy	2 (12)

DISCUSSION

- Prior cigarette use and Mallampati score may serve as predictors of tracheostomy
- Procedures involving neck dissection or mandibulectomy may be more likely to include tracheostomy
- Tracheostomy patients were more likely to present to the ED with marginal significance
- Tracheostomies introduce new potential complications
- Some predictors of tracheostomy may be confounded by disease severity
- Future directions include acquiring a larger sample size and studying TNM staging, and prior radiation therapy.

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