



Elucidating Survival and Functional Outcomes in Patients with Primary Head and Neck Malignancies Treated in Academic vs. Community Settings

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Introduction

- Previous studies have demonstrated differences in patterns of care between community and academic settings, as well as improved survival for treatment in high-volume centers, particularly for radiation and surgery.^{1,4}
- These differences have not been universally established in head and neck (HNC) cancer outcomes.
- To our knowledge, there are no previous studies that specifically examine outcome differences by treatment setting in a rural population.
- As such, the goal of this study was to evaluate differences in survival and functional outcomes of this population who underwent definitive nonsurgical treatment at an academy center compared to the community.

Methods

- This was a retrospective cohort study of patients over the age of 18 diagnosed with a primary or second primary upper aerodigestive tract mucosal malignancy treated with definitive chemoradiation or radiation at Hershey Medical Center (HMC) or a community center from 2010-2020. Those who underwent surgical resection for their primary malignancies followed by adjuvant treatment were excluded.
- Patient demographics, tumor characteristics, treatment details, tracheotomy and gastrostomy tube placement, and distance to HMC were collected.
- Data was analyzed using chi-square and t-tests for categorical and continuous variables, respectively. Kaplan-Meier method and log-rank tests were performed for survival analyses.
- Multivariable Cox proportional hazards and linear regression models were used to evaluate survival and duration of tracheotomy/feeding tube placement, respectively. P<0.05 was used for significance.

Results

Table 1: Select Patient Demographics by Treatment Location

Patient Demographics		Treatment location		
Variables		Academic (N=248)	Community (N=94)	p-value
Age	Mean (SD)	59.3 (10.41)	59.9 (10.35)	0.78
	Range	20.0-86.0)	(38.0-85.0)	
Gender	Male	209 (84.3%)	70 (74.5%)	0.037*
	Female	39 (15.7%)	24 (25.5%)	
Distance from Treatment Site	Mean (SD)	29.5 (40.4)	15.7 (15.4)	<0.0001*
	Range	(2-464)	(1-84)	
Primary Tumor Site	Hypopharynx/ pharynx	9 (3.6%)	5 (5.3%)	0.147
	Larynx	83 (33.5%)	42 (44.7%)	
	Oral cavity	11 (4.4%)	5 (5.3%)	
	Oropharynx	123 (49.6%)	32 (34.0%)	
	Others	22 (8.9%)	10 (10.6%)	
	1	24 (9.7%)	8 (8.5%)	
Overall clinical stage	2	22 (8.9%)	13 (13.8%)	0.005*
	3	28 (11.3%)	23 (24.5%)	
	4	174 (70.2%)	50 (53.2%)	
	5	27 (28.7%)	67 (71.3%)	
Treatment break	Yes	52 (21.0%)	67 (71.3%)	0.129
	No	196 (79.0%)	27 (28.7%)	
Tracheostomy tube dependence	yes	27 (10.9%)	15 (16.0%)	0.202
	no	221 (89.1%)	79 (84.0%)	
PEG tube dependence	Yes	194 (78.2%)	51 (54.3%)	<0.0001*
	No	54 (21.8%)	43 (45.7%)	

Results

Figure 1: Kaplan-Meier Survival for 2- and 5-years stratified by **academic (blue)** vs. **community (red)** for overall survival , disease-free survival, disease-specific survival, and locoregional failure-free survival

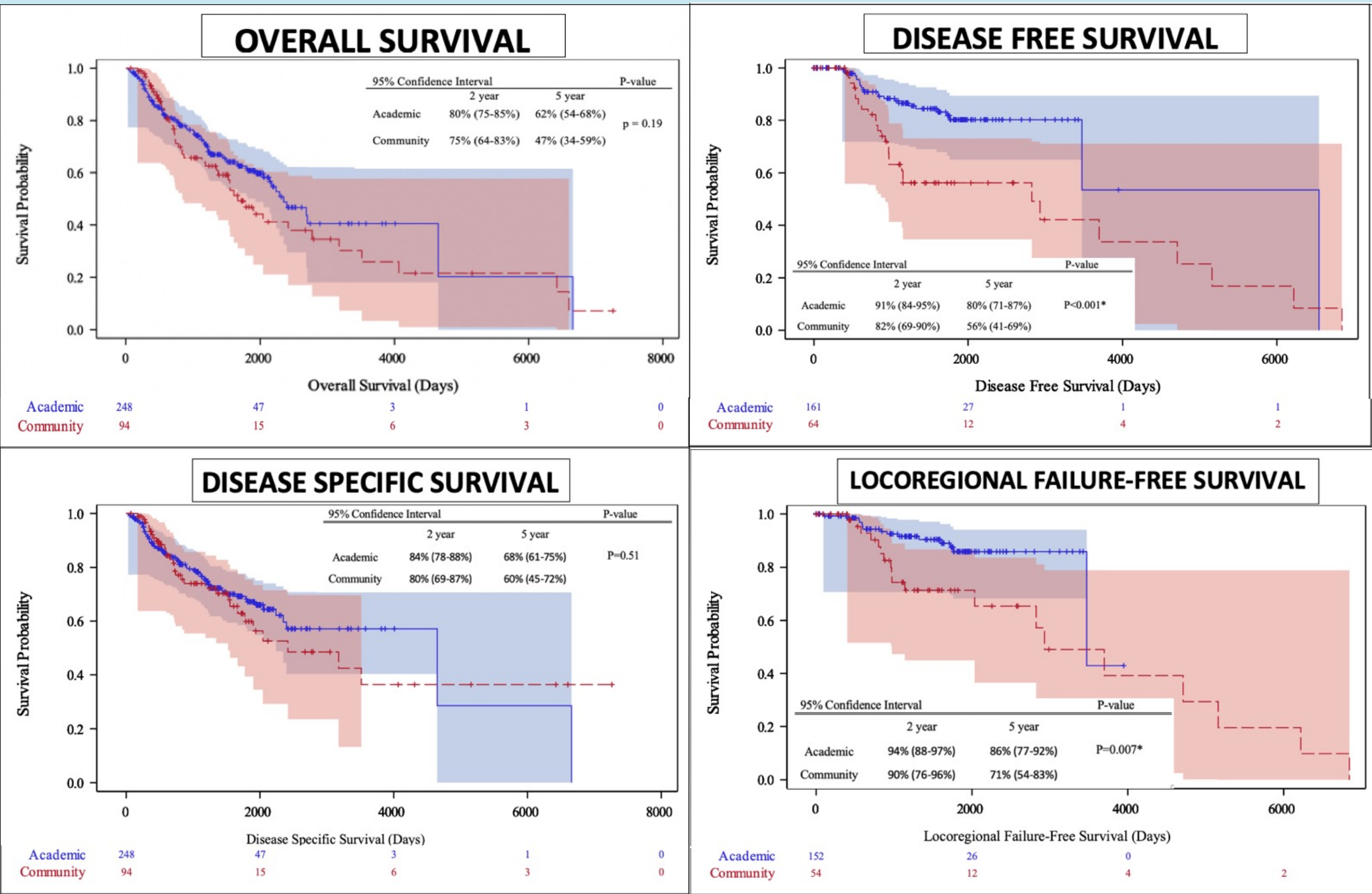


Figure 2: A) Tracheotomy and Percutaneous Endoscopic Gastrostomy (PEG) tube placement for any duration in Academic vs. Community Centers. B) Duration of tracheotomy and PEG tube placement. This analysis only considered non-zero values

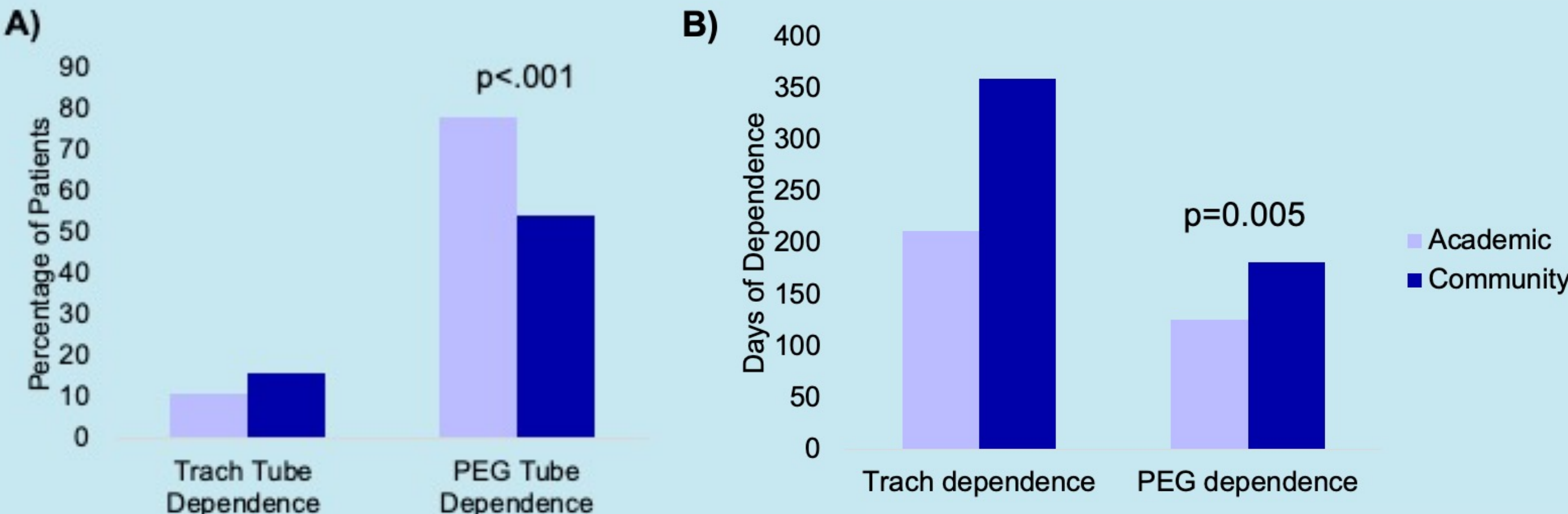


Table 2: Multivariable Cox Proportional Hazard Models for OS, DFS, DSS, and LRF for select variables. aHR= adjusted hazards ratio. *p<0.05.

Multivariate CoxPH Model		Overall survival		Disease-free survival		Disease-specific survival		Locoregional failure-free survival	
Variables		aHR (95% CI)	p-value	aHR (95% CI)	p-value	aHR (95% CI)	p-value	aHR (95% CI)	p-value
Treatment location	Academic	Reference	0.04*	Reference	0.001*	Reference	0.18	Reference	0.003*
	Community	1.52 (1.01-2.29)		2.97 (1.54-5.74)		1.38 (0.86-2.23)		3.56 (1.55-8.16)	
Age		1.04 (1.02-1.06)	<0.0001*			1.04 (1.02-1.07)	<0.0001*		
Tobacco use	Yes		0.029*	2.64 (1.11-6.29)	0.029*				
	No			Reference					
Primary Tumor Site	Hypopharynx / pharynx	1.84 (0.69-4.92)	0.002*			1.61 (0.46-5.66)	<0.0001*		
	Larynx	1.40 (0.68-2.86)				1.90 (0.81-4.46)			
	Oral cavity	5.30 (2.15-13.06)				8.48 (3.07-23.42)			
	Oropharynx	1.53 (0.76-3.08)				1.58 (0.68-3.70)			
	Others	Reference				Reference			
Response to treatment	Complete response	0.12 (0.06-0.24)	<0.0001*			0.07 (0.03-0.15)	<0.0001*		
	Partial response	0.70 (0.33-1.47)				0.61 (0.29-1.31)			
	Progressive disease	Reference				Reference			

Discussion/Conclusion

- Previous studies have demonstrated improved overall survival in the context of adjuvant CRT following surgical resection for HNC at academic or high-volume centers than in the community.^{5,6}
- This study echoed those trends, **demonstrating a 1.5x increased risk of death and 3x increased risk of recurrence for those treated with definitive CRT or RT in the community versus an academic center.**
- When adjusted for covariates, those treated in the community were dependent on both tracheotomy and PEG tube longer than those treated at an academic center.
- Distance to treatment centers remains a significant factor in determining treatment location, given the travel burden associated with treatment.
- Investigating barriers to receiving care at an academic center is paramount to maximizing patient access to an academic center.
- Limitations of this retrospective study include analysis of one academic center, thus limiting generalizability to other academic centers and lack of community records and subsequent follow-up. Additionally, the inherent limitations of a retrospective study, such as incomplete records.

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