

Tumor debulking for T4 laryngeal cancer associated with improved survival compared to upfront tracheostomy

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Background and Objectives

Patients with T4 laryngeal squamous cell carcinoma (LSCC) often require upfront airway management prior to definitive treatment. Management options include upfront tracheostomy (UT) to bypass airway tumor obstruction and endoscopic debulking (ED) of the tumor to avoid the need for tracheostomy. The University of Chicago specializes in organ preservation with definitive chemoradiation therapy (CRT) over total laryngectomy for LSCC patients. The purpose of this study was to assess survival outcomes of T4 LSCC patients pursuing organ preservation therapy with definitive CRT based on their initial airway strategy at time of diagnosis

Methods

Single-center, retrospective cohort design

Inclusion Criteria:

- Adults
- Organ preservation CRT
- January 1990 to December 2019

Test Variables (airway strategy):

- Upfront Tracheostomy
- Endoscopic Debulking

Covariates:

Age at diagnosis, race, sex, decade of diagnosis (i.e., 1990-1999, 2000-2009, 2010-2019), participation in a clinical trial, tracheostomy status after definitive treatment (for ED models), and decannulation status at 1 year after diagnosis (for UT models)

Sub-analysis:

Survival sub-analyses were performed for patients from 2010-2019 to identify effects of technical and technological advances and provide more contemporary evidence to guide clinical application.

Conclusions

- Selection of initial airway strategy in T4 LSCC has important implications for patient survival.
- Upfront tracheostomy is associated with poorer survival outcomes in T4 laryngeal cancer patients treated with CRT
- Cytoreduction via endoscopic debulking may provide a survival advantage and should be considered when initial airway management decisions are made.
- The magnitude of these changes may be increasing over the last three decades.
- Prospective, randomized investigations should be performed to more accurately assess the impact airway strategy has on survival in this population.

Cohort Demographics (N = 93)

Characteristic	Value
Male	60 (65%)
Mean Age at Diagnosis (SD)	61 (9)
Race	
White	52 (56%)
Black	40 (43%)
Other	1 (1%)
Decade Diagnosed	
1990s	13 (14%)
2000s	36 (39%)
2010s	44 (47%)
Median Months Follow-Up (IQR)	53 (78.5)
Clinical Trial	49 (53%)
Laryngectomy	12 (13%)
Upfront Tracheostomy	48 (52%)
Endoscopic Debulking	26 (28%)

Upfront Tracheostomy

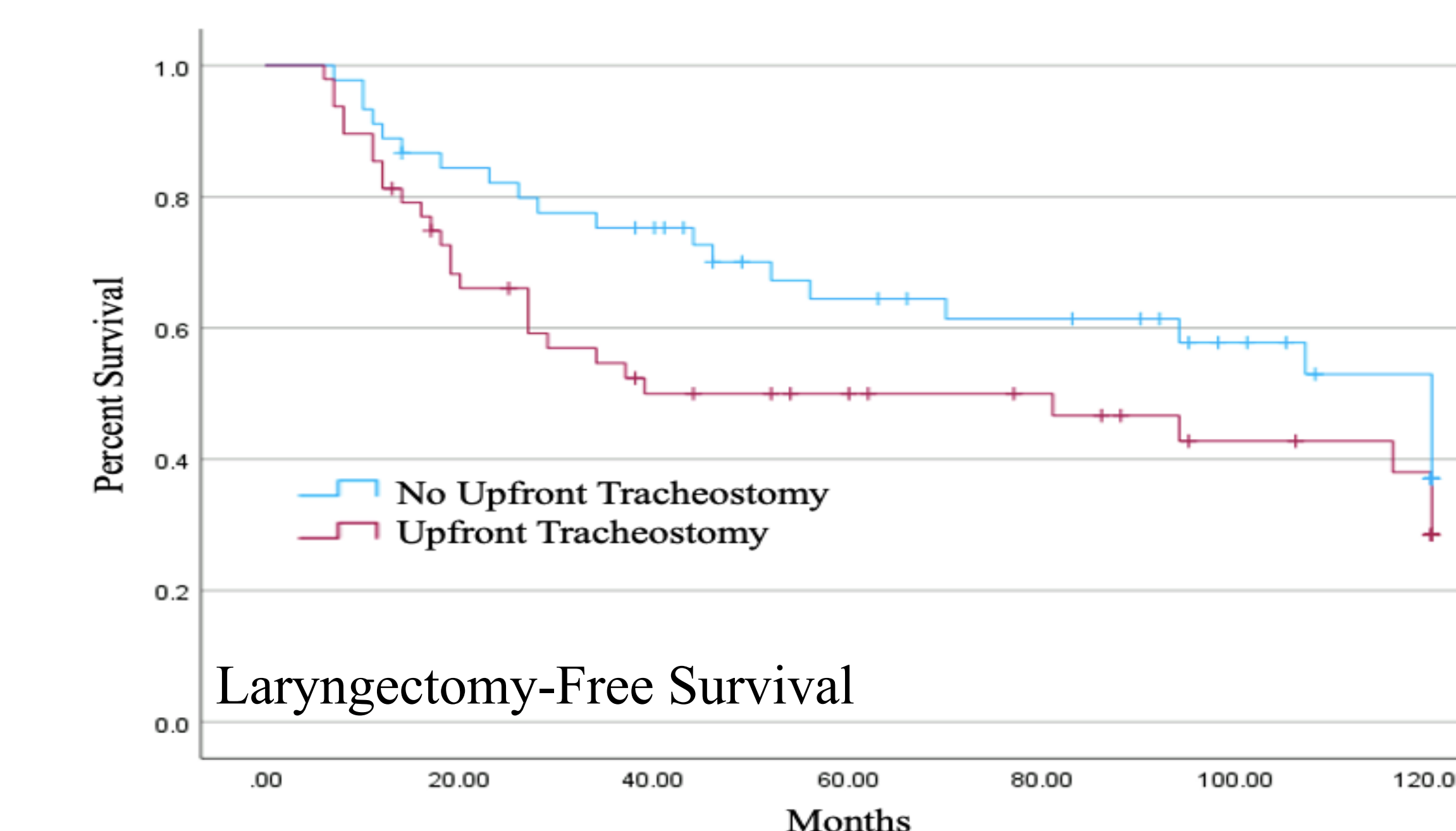
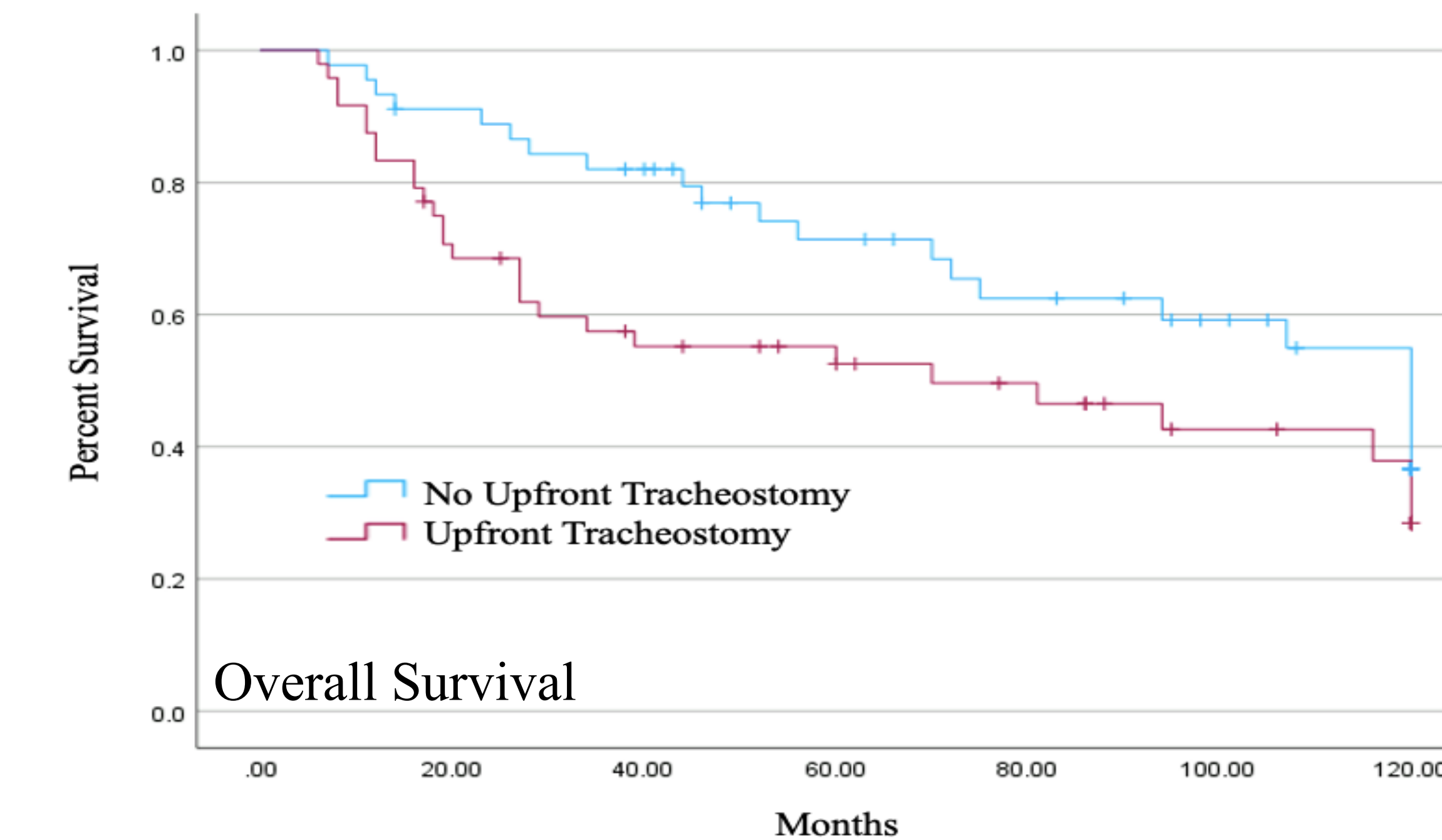


Figure Caption: Kaplan-Meier analyses of patients receiving upfront tracheostomy demonstrating 5-year overall and laryngectomy-free survival rates of 53% and 50%, respectively.

Endoscopic Debulking

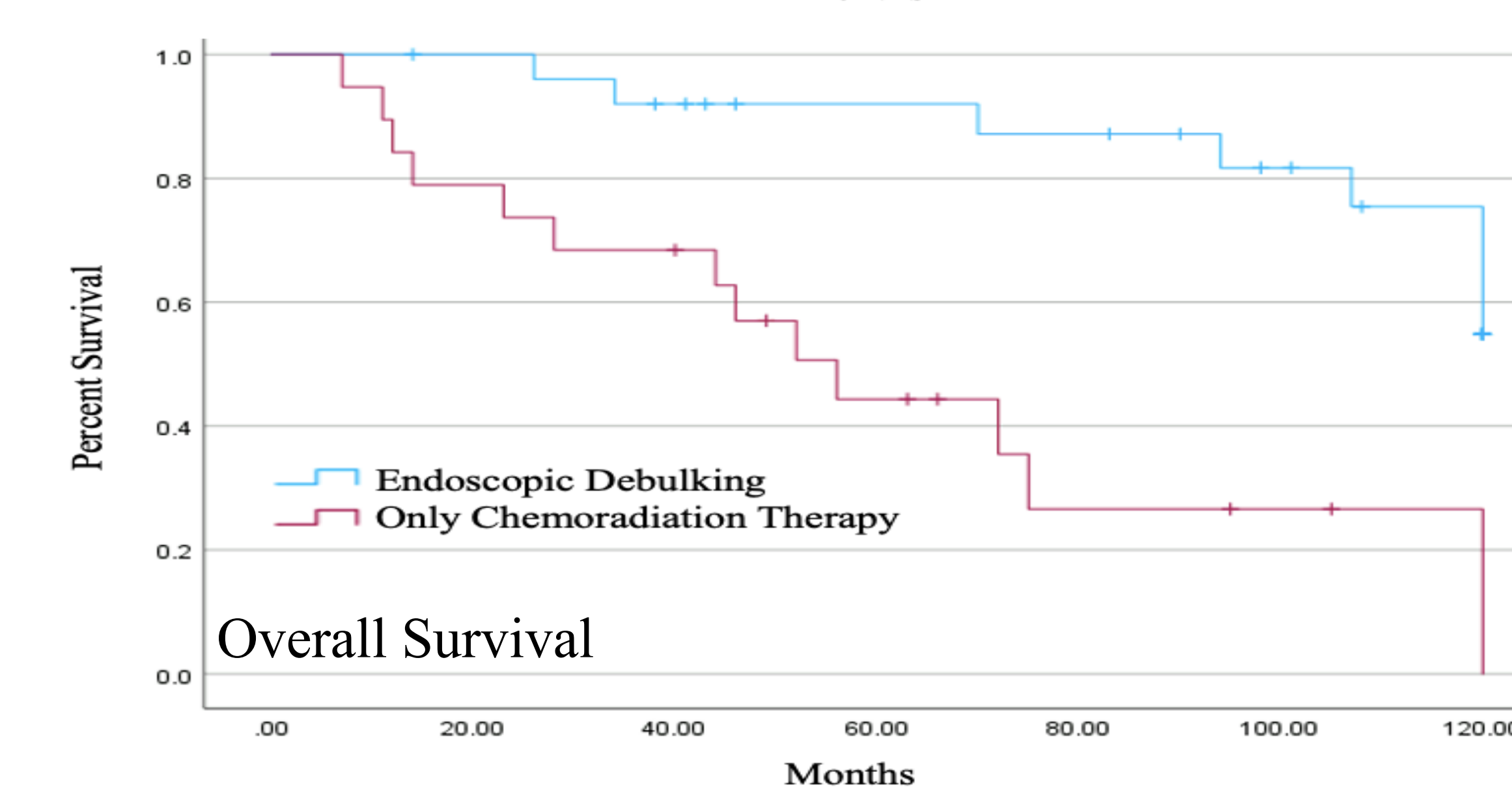
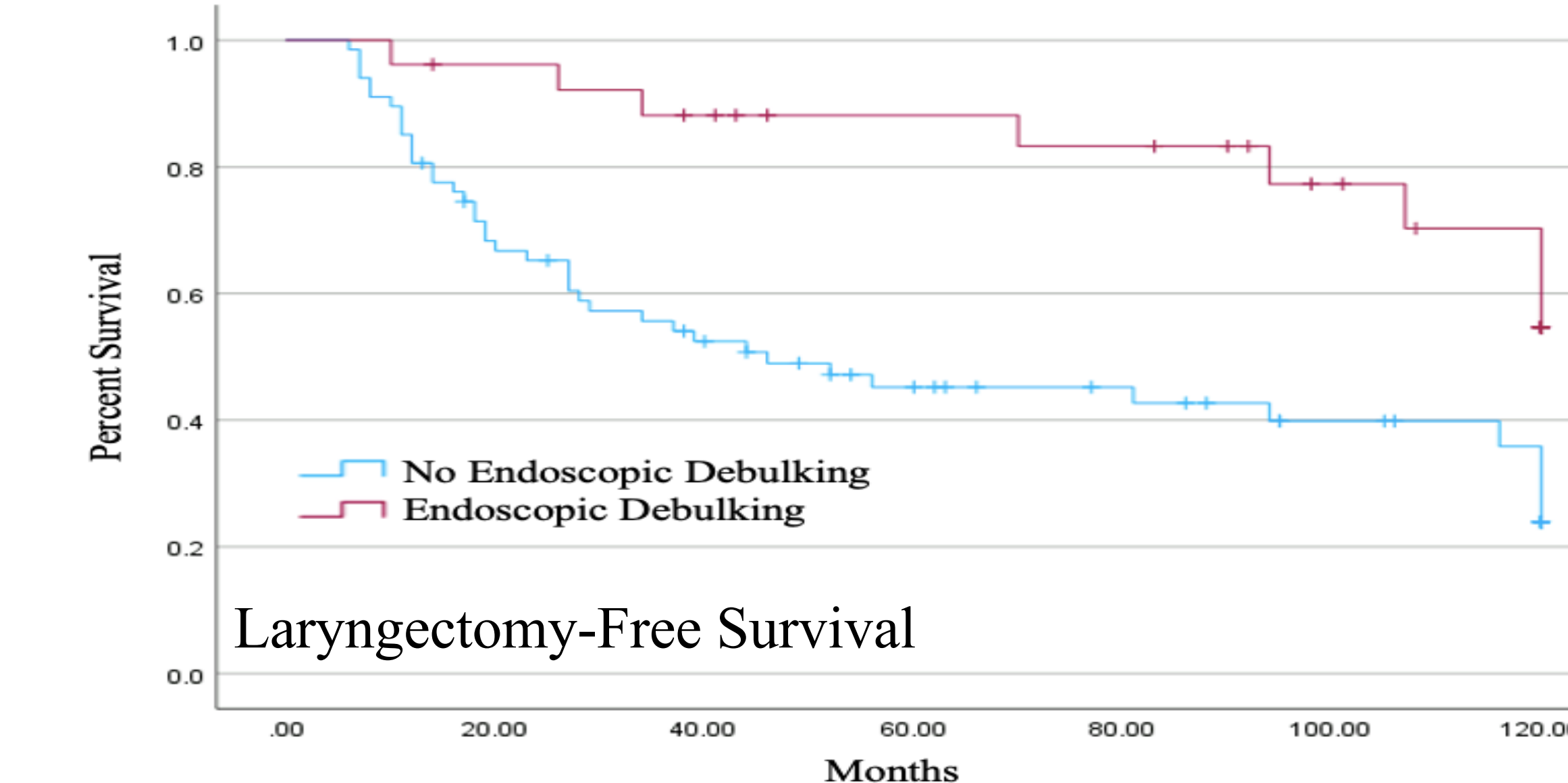
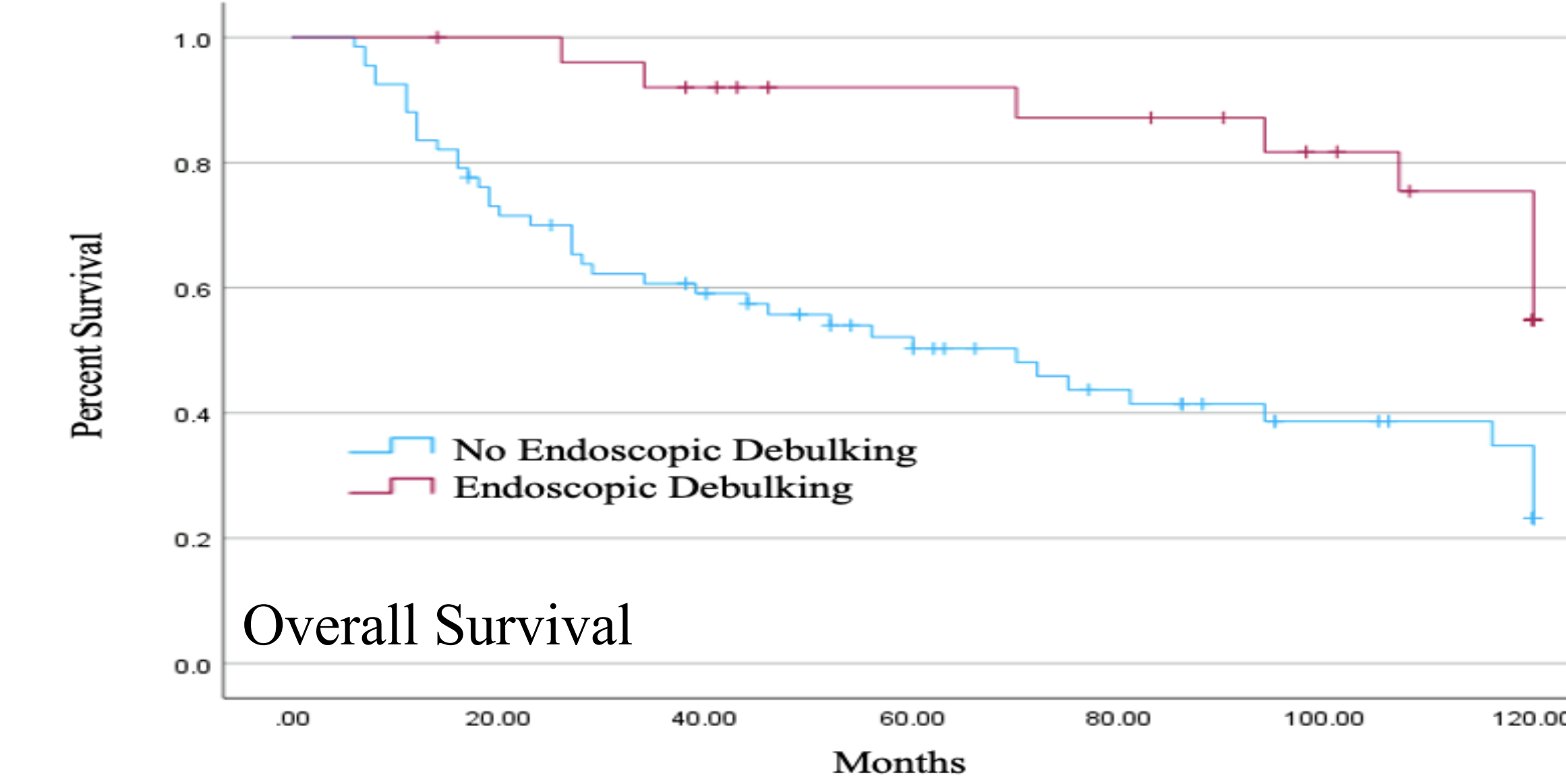


Figure Caption: Kaplan-Meier analyses of patients receiving endoscopic debulking demonstrating 5-year overall and laryngectomy-free survival rates of 92% and 88%, respectively.

Adjusted Hazard Ratios

Decade(s)	Outcome	Test Variable	aHR	95% CI	p-value
All	OS	Upfront Tracheostomy	2.38	[1.3-4.5]	0.007
All	LFS	Upfront Tracheostomy	2.36	[1.2-4.5]	0.009
2010s	OS	Upfront Tracheostomy	5.46	[1.7-18.1]	0.005
2010s	LFS	Upfront Tracheostomy	7.16	[2.0-25.2]	0.002
All	OS	Endoscopic Debulking	0.17	[0.06-0.49]	0.001
All	LFS	Endoscopic Debulking	0.16	[0.06-0.47]	<0.001
2010s	OS	Endoscopic Debulking	0.08	[0.01-0.64]	0.017
2010s	LFS	Endoscopic Debulking	0.07	[0.01-0.56]	0.012