Addressing the Neck: An NCDB Study of Clinically Node-Negative Supraglottic Squamous Cell Carcinoma

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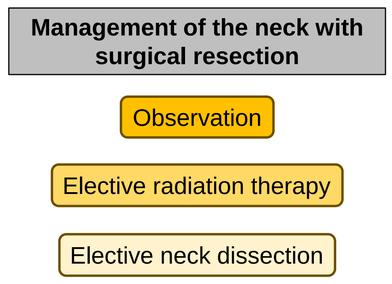
Introduction

- Early primary supraglottic squamous cell carcinoma (SSCC) may be managed by definitive radiation or surgical resection.



- **Neck management is controversial** in SSCC with a clinically node-negative neck.
- Rate of occult metastasis in cN0 SSCC ranges from 12.5-23%[2-5]
- Some studies suggest there is no benefit in prognosis in treatment of cN0 neck of SSCC[3,6]
- National practice patterns and outcomes related to neck management in cN0 surgically managed SSCC remain understudied

Objectives

1. Identify the proportion of patients undergoing elective neck dissection for SSCC addressed with partial laryngectomy
2. Examine rates of adjuvant therapy after surgical management with or without neck dissection
3. Assess associations between neck management and overall survival.

Methods and Materials

Patient data derived from the NCDB 2019 participant user file.

Inclusion criteria: primary site tumor of the supraglottis identified by ICD-10 C32.1; invasive squamous cell carcinoma histology identified by ICD-10 8051-8084 and 8120-8131; previously untreated cancers; and surgery of primary site including transoral or transcervical partial laryngectomy; clinical stage N0

Exclusion criteria: total laryngectomy, clinical or pathologic M1 stage; unknown clinical N stage; unknown pathologic T stage; pathologic T stage 0 or Tis; unknown whether lymphadenectomy was performed; and unknown whether postoperative radiation therapy was given.

Elective neck dissection was defined as a patient having lymph nodes examined for pathologic review.

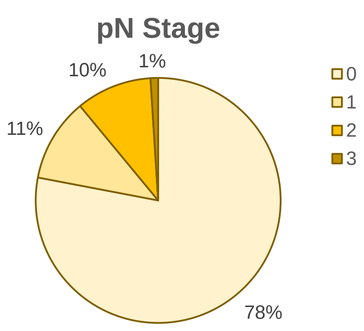
Statistical analysis:

- To examine factors associated with elective neck dissection, univariable followed by multivariable logistic regression analysis was used with neck dissection as a binary outcome. Factors with p<0.05 on univariable analysis were included in multivariable analysis.

- To examine associations between patient, surgical and pathologic factors with overall survival, univariable followed by multivariable Cox proportional hazard analysis was performed. Factors with p<0.05 on univariable analysis were included in multivariable analysis.

Results

- 1352 patients met inclusion and exclusion criteria.
- 811 patients (60%) underwent elective neck dissection (END).



22% of patients who had END performed had occult metastases (**Fig. 1**)

Facility Type	END	No END
Non-Academic	31%	43%
Academic	68%	56%
Unknown	1%	2%

Table 1 Patients who were at academic centers were more likely to have END performed (OR 1.55, 95% CI 1.19-2.02, p<0.001)

Primary Site Surgery	END
Laser excision	30%
Anterior Commissure Laryngectomy	0%
Supraglottic Laryngectomy	74%
Vertical Partial Laryngectomy	69%
Stripping	0%
Partial laryngectomy, NOS	50%

Table 2 Percent of time patients received END based on primary surgery. Compared to laser excision, patients undergoing supraglottic laryngectomy (OR 4.64, 95% CI 3.35-6.46, p<0.001) and open partial laryngectomy (OR 1.96, 95% CI 1.32-2.92, p<0.001) were more likely to have elective neck dissection.

	Multivariable OR (95% CI)	p-value
Age	0.98 (0.96-0.99)	0.002*
Insurance		
Private	[Reference]	N/A
Medicare-Medicaid-Other government	0.91 (0.69-1.21)	0.516
Uninsured	1.98 (0.90-4.70)	0.104
Unknown	6.72 (1.29-123)	0.07
Facility Type		
Non-academic	[Reference]	N/A
Academic	1.55 (1.19-2.02)	0.001*
Unknown	0.48 (0.17-1.46)	0.179
pT Stage		
1	[Reference]	N/A
2	1.7 (1.27-2.29)	<0.001*
3	2.31 (1.61-3.34)	<0.001*
4	2.4 (1.25-4.80)	0.01*
Margins		
Negative	[Reference]	N/A
Positive	0.25 (0.18-0.36)	<0.001*
Unknown	0.4 (0.24-0.66)	<0.001*
Lymphovascular Invasion		
Negative	[Reference]	N/A
Positive	2.48 (1.34-4.83)	0.005*
Unknown	0.52 (0.40-0.68)	<0.001*
Primary Site Surgery		
Laser excision	[Reference]	N/A
Anterior Commissure Laryngectomy	High (Low-High)	0.991
Supraglottic Laryngectomy	4.64 (3.35-6.46)	<0.001*
Vertical Partial Laryngectomy	2.55 (0.70-10.7)	0.167
Stripping	Low (Low-High)	0.972
Partial Laryngectomy, NOS	1.96 (1.32-2.92)	<0.001*

Table 3 Multivariable logistic regression analysis of elective neck dissection. Factors with p<0.05 on univariable logistic regression analysis were included in multivariable analysis. *p<0.05

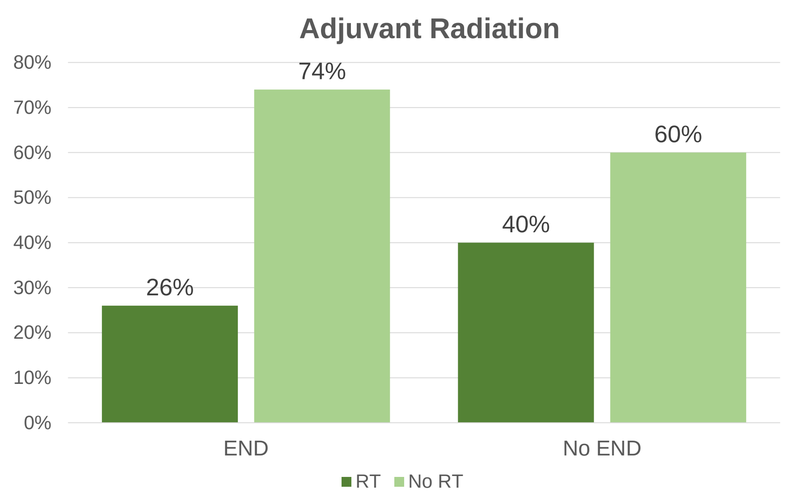


Fig. 2 26% of END patients had adjuvant radiation therapy (RT), versus 40% of no END patients (p<0.001)

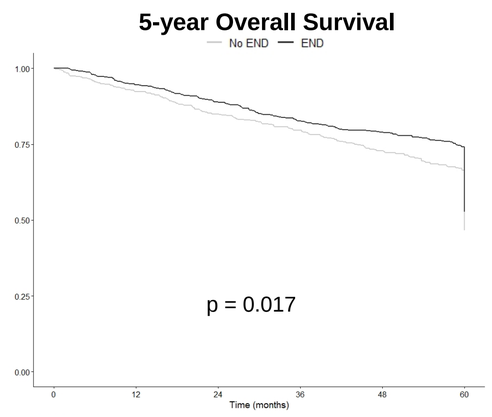


Fig. 3 Kaplan-Meier curve for no END vs. END on 5-year overall survival. Patients who had END had improved OS on univariable analysis (HR 0.81, 95% CI 0.68-0.96, p=0.017) but not multivariable analysis (HR 0.90, CI 0.74-1.10, p=0.291)

Multivariable Cox Proportional Hazard Analysis of Overall Survival		
	Multivariable HR (95% CI)	p
Age	1.03 (1.02-1.04)	<0.001*
Male	1.16 (0.96-1.40)	0.126
Insurance		
Private	[Reference]	N/A
Medicare-Medicaid-Other government	1.37 (1.11-1.69)	0.003*
Uninsured	1.35 (0.84-2.16)	0.216
Unknown	0.87 (0.35-2.13)	0.653
Charlson Comorbidity Score		
0	[Reference]	N/A
1	1.13 (0.93-1.38)	0.216
2	1.22 (0.89-1.67)	0.207
3+	1.34 (0.90-1.99)	0.145
Facility Type		
Non-academic	[Reference]	N/A
Academic	1.34 (0.90-1.99)	0.331
pT Stage		
1	[Reference]	N/A
2	1.29 (1.04-1.59)	0.021*
3	1.35 (1.06-1.72)	0.017*
4	1.73 (1.15-2.59)	0.008*
Neck Dissection		
Not performed	[Reference]	N/A
Performed	0.93 (0.77-1.13)	0.476
Lymphovascular Invasion		
Absent	[Reference]	N/A
Present	1.53 (1.06-2.21)	0.025*
Unknown	1.37 (1.13-1.65)	0.001*
Margins		
Negative	[Reference]	N/A
Positive	1.06 (0.83-1.33)	0.653
Unknown	0.89 (0.63-1.26)	0.523
Adjuvant Radiation		
Not given	[Reference]	N/A
Given	1.25 (10.02-1.54)	0.034*
Unknown	1.06 (0.49-2.27)	0.883

Table 3 Multivariable Cox proportional hazard analysis of overall survival. Factors with p<0.05 on univariable survival analysis were included in multivariable analysis. *p<0.05

Discussion

- The rate of occult metastasis for cN0 SSCC was 22%, yet 40% of patients with cN0 SCC did not receive END.
- Patients treated at academic centers were more likely to receive END.
- Patients who had open partial laryngectomy were more likely to have END than patients undergoing laser excision.
- After END, patients were less likely to receive adjuvant radiation therapy without a decrease in overall survival.

Study Limitations

- Retrospective study that does not have information on laterality of neck dissections.
- No information on disease-free survival, local control, or regional control after treatment (NCDB).
- Functional data not available, although outcomes are closely related to the extent of laryngeal surgery performed[7, 8]

Conclusions

- Many patients do not receive elective neck dissection with resection of primary supraglottic squamous cell carcinoma, despite relatively high rates of occult metastasis.
- Patients who receive elective neck dissection are less likely to receive adjuvant radiation therapy.

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