Swallowing & Speech Outcomes After TORS ± Adjuvant Therapy for HPV(+) Oropharyngeal Squamous Cell Carcinoma

Quick MH[1], Van Abel KM[1], Graner DE[2], Lohse CM[3], Ma DJ[4], Price KP[5], Price DL[1], Moore EJ[1]

[1]Department of Otolaryngology — Head & Neck Surgery, [2]Division of Speech Pathology, [3]Division of Biomedical Statistics & Bioinformatics, [4]Department of Radiation Oncology, [5]Department of Medical Oncology

Mayo Clinic, Rochester, MN

Importance

Understanding functional swallowing and speech outcomes for HPV(+) oropharyngeal squamous cell carcinoma (OPSCC) patients beyond the binary PEG/no PEG, tracheostomy/no tracheostomy is important for patient counseling and further validation of the need for treatment de-escalation strategies.

Objective

To compare measures of swallowing and speech outcomes in HPV(+) OPSCC patients undergoing TORS-based therapy with neck dissection (ND) +/- radiation(RT) or chemoradiation(CRT).

Participants

We identified patients with primary HPV(+) OPSCC of the base of tongue and tonsil who underwent TORS-based therapy with intent-to-cure at our institution from 05/01/2007-05/31/2015. No patients receiving adjuvant de-escalation were included.

Main Outcomes & Methods

- Design: Retrospective Chart Review
- Setting: Academic Hospital

Clinical data were retrieved from diagnosis to study end. A study-ending event was defined as last follow-up, new tumor, metastasis, or death. Formal speech evaluations were collected when available, most commonly prior to and following adjuvant therapy. Patients were staged according to the 7th edition AJCC staging system. Scored evaluations included the Functional Oral Intake Scale (FOIS), Performance Status Scale for Head & Neck Cancer Patients (PSS-HN), Functional Contextual Speech Intelligibility, hoarseness and hypernasality.

Study Demographics

A total of 267 patients (median 58yrs old, 89% male, 66% tonsil, 90% T1/T2, 70% N2) met criteria. Most were never smokers (48%) with an ACE-27 score of 0 (42%). Treatment included TORS+ND in 25%, TORS+ND+RT in 30% and TORS+ND+CRT in 45%. ND was most commonly ipsilateral (88%), no patient received a free flap, the median total gray was 60 (range 48-70), and high dose cisplatin was used in 55% (55/100).

Pathological Demographics

Feature	S N=67	S-R N=81	S-CRT N=119	P-value
	N (%)			
Pathologic T stage				
TX	0	1 (1)	1 (1)	0.77
T1	26 (39)	36 (44)	49 (41)	
T2	33 (49)	35 (43)	60 (50)	
T3	6 (9)	5 (6)	6 (5)	
T4a	2 (3)	4 (5)	3 (3)	
Pathologic N stage				
N0	28 (42)	7 (9)	2 (2)	<0.001
N1	10 (15)	10 (12)	4 (3)	
N2a	13 (19)	21 (26)	18 (15)	
N2b	14 (21)	37 (46)	75 (63)	
N2c	1 (1)	4 (5)	7 (6)	
N3	1 (1)	2 (2)	13 (11)	
Overall AJCC stage				
I	12 (18)	1 (1)	0	<0.001
II	14 (21)	4 (5)	1 (1)	
III	12 (18)	10 (12)	4 (3)	
IVa	28 (42)	64 (79)	102 (86)	
IVb	1 (1)	2 (2)	12 (10)	

S = surgery; R = radiation; CRT = chemoradiation

Figure 1: Comparison of pathologic stage by primary treatment.

FOIS Results

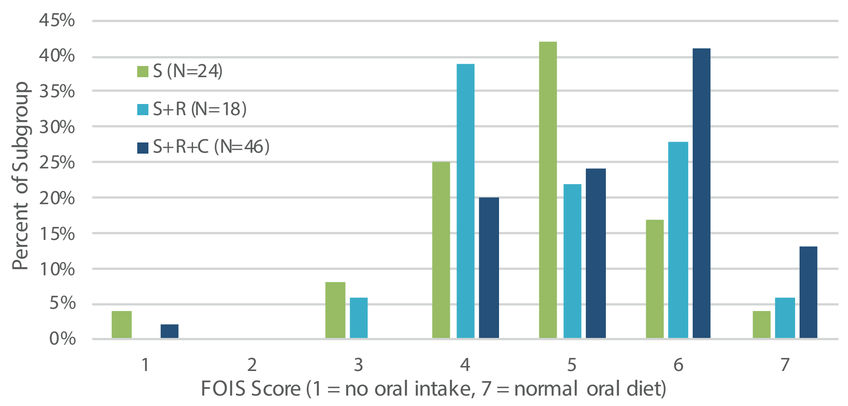

Figure 2: Functional Oral Intake Scale (FOIS) scores on last follow-up.

Speech & Swallowing Outcomes

	All	S	S-R	S-CRT	
	N (%)				P-value
Swallowing Status					
Nasogastric tube placement	N=266	N=67	N=80	N=119	
Prior to treatment	0	0	0	0	0.42
During treatment	138 (52)	33 (49)	38 (48)	67 (56)	
None	128 (48)	34 (51)	42 (53)	52 (44)	
PEG tube placement	N=261	N=64	N=79	N=118	
Prior to treatment	3 (1)	0	2 (3)	1 (1)	<0.001
During treatment	74 (28)	2 (3)	13 (16)	59 (50)	
None	184 (71)	62 (97)	64 (81)	58 (49)	
Final Swallowing Status	N=267	N=67	N=81	N=119	
Full oral	259 (97)	64 (96)	80 (99)	115 (97)	0.28
NGT	2 (1)	2 (3)	0	0	
Oral/PEG	3 (1)	1 (1)	0	2 (2)	
Full PEG	2 (1)	0	1 (1)	2 (2)	
Airway Status					
Tracheostomy	N=267	N=67	N=81	N=119	
Prior to treatment	1 (<1)	1 (1)	0	0	0.019
During treatment	29 (11)	4 (6)	5 (6)	20 (17)	
None	237 (89)	62 (93)	76 (94)	99 (83)	
Tracheostomy during treatment	N=29	N=4	N=5	N=20	
Removed	27 (93)	2 (50)	5 (100)	20 (100)	0.015
Not removed	2 (7)	2 (50)	0	0	
Final Airway Status	N=267	N=67	N=81	N=119	
Normal	265 (99)	65 (97)	81 (100)	119 (100)	0.062
Tracheostomy	2 (1)	2 (3)	0	0	

S = surgery; R = radiation; CRT = chemoradiation

Figure 3: Comparisons of swallowing status and airway status by primary treatment.

Results

PEG was placed in 28% and was more common for TORS+ND+CRT (p<0.001). At study end, 259 (97%) reported a full oral diet with two patients fully PEG tube dependent. A tracheostomy was placed prior to or during treatment in 30 patients (11%) with all but two tracheostomy-free at study end. FOIS scores were rated at 5/6/7 for 73% (69/94) of patients before adjuvant therapy and 69% (60/87) at study end a median of 6.3 (2.2-17.1) months following treatment. PSS-HN was 75-100% for public eating in 81% (26/32) and normalcy of diet in 55% (17/31) before adjuvant therapy. At study end this dropped to 67% (30/45) and 27% (12/44), respectively. PSS-HN for speech understandability was 75-100% in 100% (32/32) and PSS-HNS functional contextual speech intelligibility was 100% at both time points. Hoarseness and hypernasality were present in 27% (26/98) and 7% (7/98) prior to adjuvant and in 42% (38/91) and 9% (8/91) at study end, respectively.

Conclusion

We found a 97% return to full oral diet and <1% risk of long term tracheostomy dependence for TORS-based therapy. While encouraging, these outcomes are not a surrogate for normal swallowing and speech. Although the relatively lower number of patients undergoing speech evaluation represents a study bias, validated swallowing and speech measures associated with quality of life demonstrated worsening function in almost all measures following standard adjuvant therapy. Further prospective studies are needed, and currently underway, to investigate the impact of treatment de-escalation on swallowing and speech outcomes.

References

[1] Crary MA, Carnaby-Mann GD, Groher ME. Initial psycho-metric assessment of a functional oral intake scale for dysphagia in stroke patients. *Arch Phys Med Rehabil*. 2005;86:1516-1520.

[2] List MA, Ritter-Sterr C, Lansky SB. A Performance Status Scale for Head and Neck Cancer Patients. *Cancer*. 1990;66:564-569.

[3] Edge SB, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A. *AJCC Cancer Staging Handbook*. Springer; 2009.

[4] Yeh DH, Tam S, Fung K, et al. Transoral robotic surgery vs. radiotherapy for management of oropharyngeal squamous cell carcinoma - A systematic review of the literature. *Eur J Surg Oncol*. 2015;41(12):1603-1614.

Contact Information

Web: https://www.mayoclinic.org/

Email: vanabel.kathryn@mayo.edu

Phone: +1 (507) 284 2511