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Functional Outcomes After Robotic Assisted Salvage Surgery for Oropharyngeal Cancer

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Medical University of South Carolina
39th Annual F. Johnson Putney Lectureship in Head and Neck Cancer
October 24, 2025

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Disclosures

No financial disclosures or conflicts of interest

Nonfinancial: No relevant nonfinancial relationship to disclose

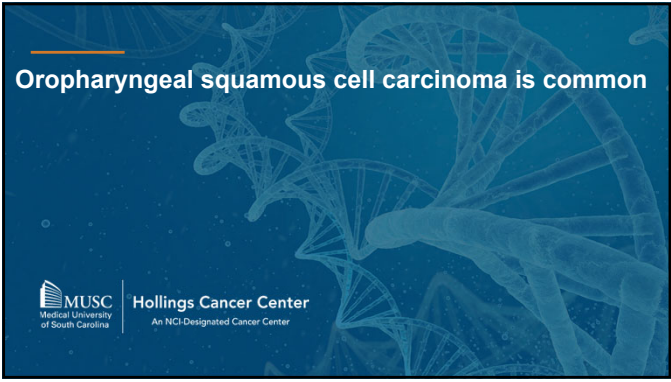


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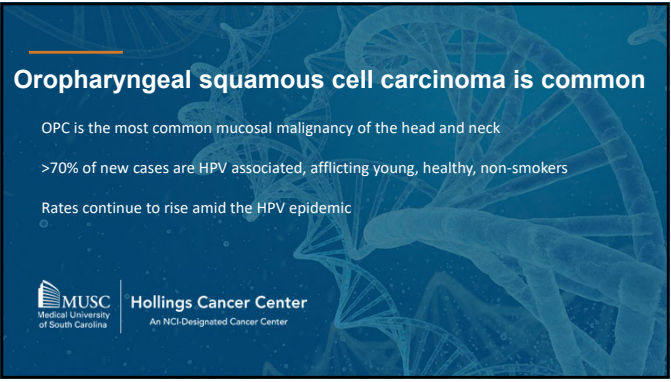
Oropharyngeal squamous cell carcinoma is common



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Oropharyngeal squamous cell carcinoma is common

- OPC is the most common mucosal malignancy of the head and neck
- >70% of new cases are HPV associated, afflicting young, healthy, non-smokers
- Rates continue to rise amid the HPV epidemic



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Prognosis and functional outcomes after treatment of primary OPC are favorable

Research

JAMA Otolaryngology-Head & Neck Surgery | Original Investigation

Dysphagia After Primary Transoral Robotic Surgery With Neck Dissection vs Nonsurgical Therapy in Patients With Low- to Intermediate-Risk Oropharyngeal Cancer

Katherine A. Hutchison, PhD, Carla L. Wernke, MS, Christopher M. K. L. Yao, MD, Jharrovi Zaveri, MPH, Bahar E. Elgaphar, MD, Ryan Goepfert, MD, Amy C. Hessel, MD, Michael E. Kupferman, MD, Stephen Y. Lu, MD, PhD, C. David Fuller, MD, PhD, G. Brandon Gunn, MD, Adam S. Garden, MD, Faye Johnson, MD, PhD, Renata Ferrarotto, MD, Jan S. Lewin, PhD, Neil D. Gross, MD, for the MD Anderson Head and Neck Cancer Symptom Working Group



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Table 2. Longitudinal MBS Dysphagia Grade (per DIGEST) by Primary Treatment Group

DIGEST Score	No. (%) of Patients (95% CI)		Cramer V (95% CI) ^a
	Primary TORS Group (n = 75)	Primary Radiotherapy Group (n = 182)	
At 3–6 mo			
Grade 0	25 (33.3) [22.9 to 45.2]	72 (39.6) [32.4 to 47.1]	
Grade 1 (mild)	29 (38.7) [27.6 to 50.6]	47 (25.8) [19.6 to 32.8]	
Grade 2 (moderate)	4 (5.3) [1.5 to 13.1]	23 (12.6) [8.2 to 18.4]	0.18 (0.06 to 0.28)
Grade 3 (severe)	1 (1.3) [0.0 to 7.2]	6 (3.3) [1.2 to 7.0]	
Missing	16 (21.3) [12.7 to 32.3]	34 (18.7) [13.3 to 25.1]	
Prevalence DIGEST grade ≥2	5 (6.7) [2.2 to 14.9]	29 (15.9) [10.9 to 22.1]	–0.14 (–0.23 to –0.01)



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Prognosis and functional outcomes after treatment of primary OPC are favorable

Journal of Neuro-Oncology Head & Neck Section | Original Investigation
 Dysphagia After Primary Transoral Robotic Surgery With Neck Dissection vs Nonsurgical Therapy in Patients With Low- to Intermediate-Risk Oropharyngeal Cancer

Table 3. Localities of MRD Dysphagia Grade (from DIGEST) by Primary Treatment Group

Grade 0	25 (33.3) [22.9 to 45.2]	72 (39.6) [32.4 to 47.1]	
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Unfortunately, at least 17% patients have local or regional recurrence

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What are we doing to mitigate adverse outcomes for recurrent oropharyngeal squamous cell carcinoma?

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What are we doing to improve outcomes for recurrent oropharyngeal squamous cell carcinoma?

Review
The Lack of Standardized Outcomes for Surgical Salvage of HPV-Positive Recurrent Oropharyngeal Squamous Cell Carcinoma: A Systematic Scoping Review

April N. Taniguchi^{1,2}, Sarah R. Sutton^{1,3}, Shaun A. Nguyen^{1,*}, Alexandra E. Kejner¹ and William G. Albergotti¹

¹ Department of Otolaryngology-Head and Neck Surgery, Medical University of South Carolina, Charleston, SC 29425, USA
² College of Medicine, University of Central Florida, Orlando, FL 32827, USA
³ School of Medicine, University of Nevada, Reno, NV 89507, USA
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What are we doing to mitigate adverse outcomes for recurrent oropharyngeal squamous cell carcinoma?

Salvage surgery often remains a key treatment option for locoregional recurrent oropharyngeal squamous cell carcinoma

HPV-Positive Recurrent Oropharyngeal Squamous Cell Carcinoma: A Systematic Scoping Review

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What are we doing to mitigate adverse outcomes for recurrent oropharyngeal squamous cell carcinoma?

Salvage surgery often remains a key treatment option for locoregional recurrent oropharyngeal squamous cell carcinoma

Traditional approaches to the oropharynx are morbid and carry significant long term functional limitations

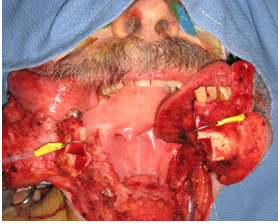
and William G. Albergotti¹

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Lip-split mandibulotomy

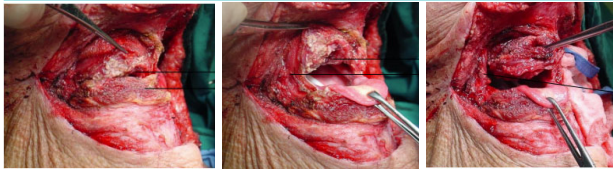


- Excellent access, good for significant trismus
- Must osteotomize mandible (often radiated in salvage setting)
- Traditionally requires lip split incision
- Divided floor of mouth musculature
- CNXII often non-salvageable

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Transhyoid and lateral pharyngotomy



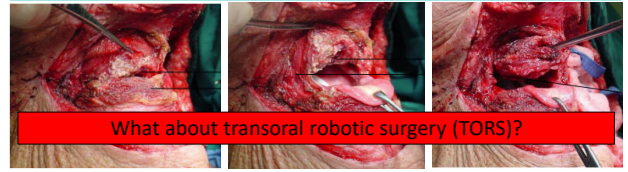
Offers excellent exposure to lateral pharynx and even hypopharynx but **ENTRY IS OFTEN BLIND**

Can be used for tumors involving the mandible (w/ posterior mandibulectomy & offers ability to address trismus if needed)

Limited access to base of tongue if no mandibulectomy and no pull through is performed.

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Transhyoid and lateral pharyngotomy



What about transoral robotic surgery (TORS)?

Offers excellent exposure to lateral pharynx and even hypopharynx but **ENTRY IS OFTEN BLIND**

Can be used for tumors involving the mandible (w/ posterior mandibulectomy & offers ability to address trismus if needed)

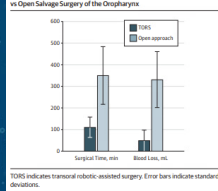
Limited access to base of tongue if no mandibulectomy and no pull through is performed.

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Salvage Surgery for Recurrent Cancers of the Oropharynx Comparing TORS With Standard Open Surgical Approaches

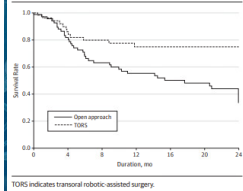
William H. Hsu, MD, David Hsu, MD, Christopher Hollings, MD, Eric M. Hsu, MD,
Tanner (Shaw), MD, PhD, William Carroll, MD, Eben Rosenthal, MD, Leticia Seewy, MD, J. Scott Magnuson, MD

Figure 1. Comparison of Operative Time and Blood Loss Between TORS vs Open Salvage Surgery of the Oropharynx



TORS indicates transoral robotic assisted surgery. Error bars indicate standard deviations.

Figure 6. Two-Year Recurrence-Free Survival



TORS indicates transoral robotic assisted surgery.

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Transoral Robotic Surgery for the Salvage of Primarily Irradiated Oropharyngeal Squamous Cell Carcinomas Recurring at the Base of the Tongue: A Small Monoinstitutional Series

Samarie Prasad, MD, David Hsu, MD, Roberto Gallego, MD, Nicholas Marchenko, MD, Sergio Camacho, MD,
Dhan Maheshwari, MD, Jorge Gallo, MD, and Francesco Renna, MD

Table 2. Summary of the clinical history of the 4 study patients who underwent salvage TORS.

Case	Age at Diagnosis (Years)	cT	cN	HPV Status (p16 mRNA on Fresh Sample)	Time to TORS Salvage (Months)	Pre-Op Composite MDADI	cT #	cN #	G ₁ PNI	Post-Op Composite MDADI	Post-TORS Relapse	Dead/Alive	Last Follow-Up After TORS (Months)
1 *	49	4	2c	Positive	65	69	1	0	IL -	73	No	Alive	105
2 *	60	4	2c	Negative	24	68	2	0	IL -	66	No	DOC	72
3	69	1	2b	Negative	18	66	2	0	IL +	-	Yes (time to relapse 3 months)	DOD	11
4	74	3	2c	Negative	9	68	2	2c	IL -	70	No	Alive	96

cT, clinical T classification; cN, clinical N classification; HPV, human papilloma virus; TORS, transoral robotic surgery; MDADI, MD Anderson Dysphagia Inventory; cT, T classification of the recurrence; cN, N classification of recurrence; DOC, death of other causes; DOD, death of disease; PNI, peritumoral invasion; +, present; -, absent. * Details of Cases 1 and 2 are shown in Figure 1. # The r staging always corresponded to the final pathological (p) staging.

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Transoral Robotic Surgery for the Salvage of Primarily Irradiated Oropharyngeal Squamous Cell Carcinomas Recurring at the Base of the Tongue: A Small Monoinstitutional Series

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Dhan Maheshwari, MD, Jorge Gallo, MD, and Francesco Renna, MD

What about larger tumors which require reconstruction?

Case	Age at Diagnosis (Years)	cT	cN	HPV Status (p16 mRNA on Fresh Sample)	Time to TORS Salvage (Months)	Pre-Op Composite MDADI	cT #	cN #	G ₁ PNI	Post-Op Composite MDADI	Post-TORS Relapse	Dead/Alive	Last Follow-Up After TORS (Months)
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Case Series

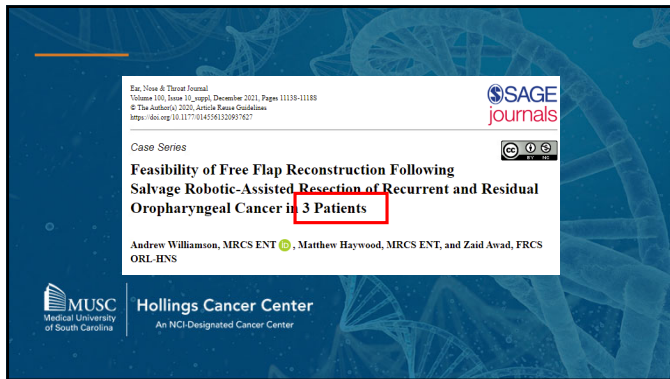
Feasibility of Free Flap Reconstruction Following Salvage Robotic-Assisted Resection of Recurrent and Residual Oropharyngeal Cancer in 3 Patients

Andrew Williamson, MRCS ENT, Matthew Haywood, MRCS ENT, and Zaid Awad, FRCS ORL-HNS

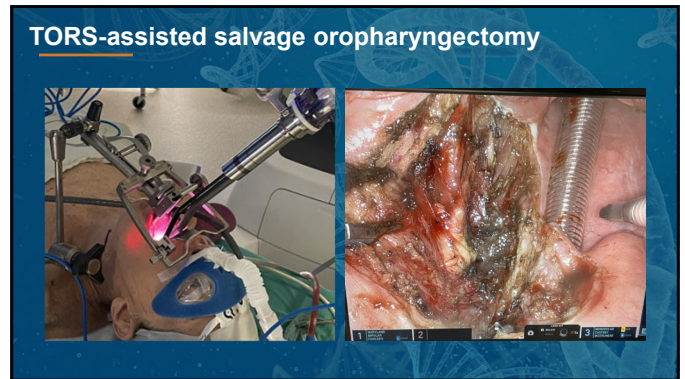


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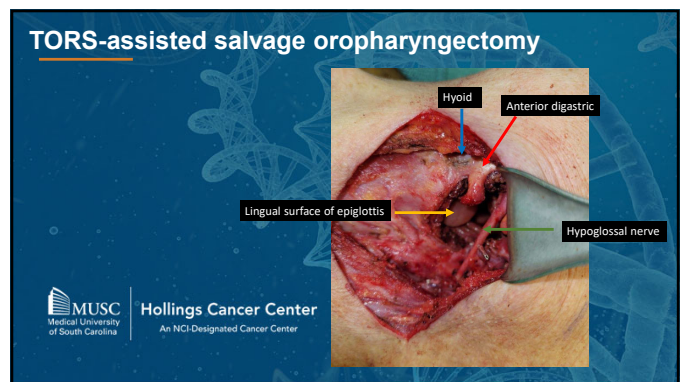
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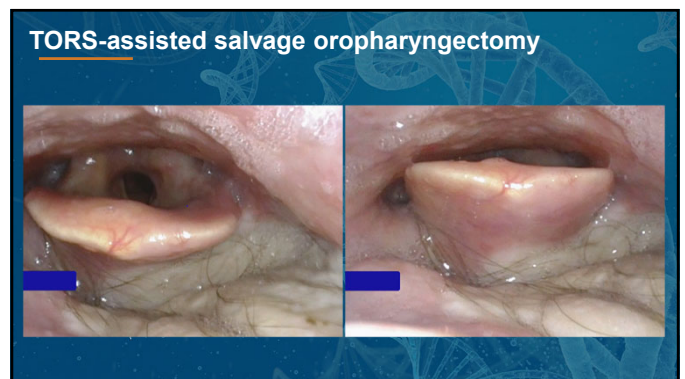
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Characteristic	All patients (n= 47)	
Length of hospital stay, days, mean (SD)	8.0 (5.2)	-Short hospital stay on average
Trach dependence at last follow up		
Yes (%)	7 (14.9)	
No (%)	40 (85.1)	-85% of patients are able to be decannulated
Days to first MBS (SD)	28.7 (13.4)	
Days to first oral intake (SD)	36.4 (32.6)	
Aspiration on first MBS		
Yes (%)	19 (40.4)	-High rate of early aspiration on MBS
No (%)	28 (59.6)	
Anastomotic leak on first MBS		
Yes (%)	5 (10.6)	-Low rate of leak
No (%)	42 (89.4)	
Days to feeding tube removal, mean (SD)	102.1 (71.6)	
Feeding tube removed at last follow up		
Yes (%)	22 (50.0)	-50% of patients with long term feeding tube
No (%)	22 (50.0)	

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MDADI: MD Anderson Dysphagia Inventory

Validated, self administered 20-item measure of swallowing-related quality of life ranging from 20 (worst) to 100 (best)

Composite score change in >10 is widely regarded as clinically relevant significant difference

M. D. Anderson Dysphagia Inventory

This questionnaire asks for your views about your swallowing ability. This information will help us understand how you feel about swallowing. The following statements have been made by people who have problems with their swallowing. Some of the statements may apply to you.

Please read each statement and circle the response which best reflects your experience in the past week.

1 = Strongly agree 2 = Agree 3 = No Opinion 4 = Disagree 5 = Strongly Disagree

(1) My swallowing ability limits my day-to-day activities.....	0 1 2 3 4 5
(2) I am embarrassed by my eating habits.....	0 1 2 3 4 5
(3) People have difficulty cooking for me.....	0 1 2 3 4 5
(4) Swallowing is more difficult at the end of the day.....	0 1 2 3 4 5
(5) I do not feel self-conscious when I eat.....	0 1 2 3 4 5
(6) I am upset by my swallowing problem.....	0 1 2 3 4 5
(7) Swallowing takes great effort.....	0 1 2 3 4 5
(8) I do not go out because of my swallowing problem.....	0 1 2 3 4 5
(9) My swallowing difficulty has caused me to lose income.....	0 1 2 3 4 5
(10) It takes me longer to eat because of my swallowing problem.....	0 1 2 3 4 5
(11) People ask me, "Why can't you eat that?".....	0 1 2 3 4 5
(12) Other people are irritated by my swallowing problem.....	0 1 2 3 4 5
(13) I cough when I try to drink liquids.....	0 1 2 3 4 5
(14) My swallowing problems limit my social and personal life.....	0 1 2 3 4 5
(15) I feel free to go out to eat with my friends, neighbors and relatives.....	0 1 2 3 4 5
(16) I limit my food intake because of my swallowing difficulty.....	0 1 2 3 4 5
(17) I cannot maintain my weight because of my swallowing problem.....	0 1 2 3 4 5
(18) I have low self-esteem because of my swallowing problem.....	0 1 2 3 4 5
(19) I feel that I am swallowing a huge amount of food.....	0 1 2 3 4 5
(20) I feel excluded because of my eating habits.....	0 1 2 3 4 5

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PSS-HN: Performance Status Scale for Head and Neck Cancer Patients

Significant predictor of quality of life

Easy to interpret and administer

Score of 0 = completely tube feed dependent

PERFORMANCE STATUS SCALE FOR HEAD AND NECK CANCER PATIENTS (PSS-HN)

Patient Name: _____ Date: _____

VERBALILITY OF SPEECH

100 All clear (no tracheostomy)

90 Soft but understandable

80 Not clear, others

70 No verbal communication

60 No verbal communication

50 Soft speech (e.g., mumbling, incomprehensible words)

40 Soft speech requiring no listening

30 Soft speech requiring no listening

20 Speech heard by others

10 Speech heard by others

0 No verbal communication

PUBLIC EATING

100 No restriction of place, food or quantity (no diet)

75 No restriction of place, but limited food choices

50 No restriction of place, but limited food choices

25 No restriction of place, but limited food choices

0 No restriction of place, but limited food choices

FUNCTIONALITY OF SPEECH

100 Clear verbalization

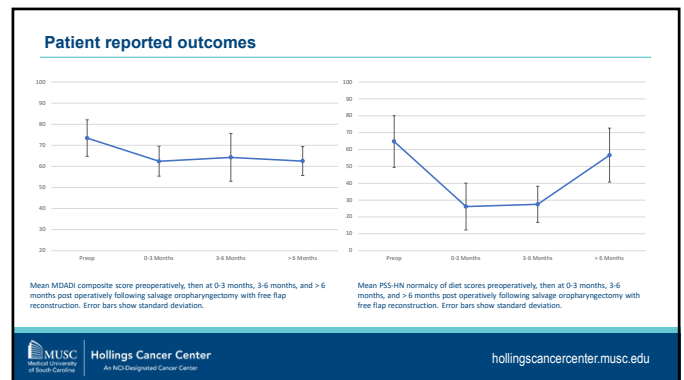
75 Understandable speech

50 Understandable speech

25 Understandable speech

0 No verbal communication

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Future directions

Incorporate DIGEST score from preoperative and postoperative modified barium swallow data

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Future directions

Incorporate DIGEST score from preoperative and postoperative modified barium swallow data

Multivariate regression analysis of patient and surgical predictors of:

- G-Tube dependence
- Tracheostomy dependence
- Short and long term DIGEST and MDADI scores

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Future directions

Incorporate DIGEST score from preoperative and postoperative modified barium swallow data

Multivariate regression analysis of patient and surgical predictors of:

- G-Tube dependence
- Tracheostomy dependence
- Short and long term DIGEST and MDADI scores

Review impact of re-irradiation and/or adjuvant chemo/immunotherapy



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Future directions

Incorporate DIGEST score from preoperative and postoperative modified barium swallow data

Multivariate regression analysis of patient and surgical predictors of:

- G-Tube dependence
- Tracheostomy dependence
- Short and long term DIGEST and MDADI scores

Review impact of re-irradiation and/or adjuvant chemo/immunotherapy

Review oncologic data for:

- Local regional and distant disease control
- Neoadjuvant chemo/immunotherapy as predictors of improved functional outcomes



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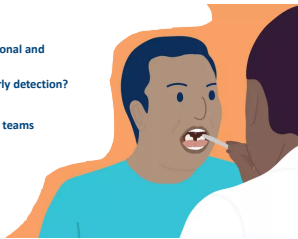
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Routine and frequent follow up

Early detection may play a role in improved functional and oncologic outcomes

Will ctDNA further aid in meaningful early detection?

Early and lifelong engagement with dedicated SLP teams



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Through and thoughtful multidisciplinary team of experts is key



Careful patient selection and preoperative counseling paramount

Most patients are likely to need multidisciplinary treatment plans

These select group of patients should be considered for clinical trials



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Despite the complex nature, complications in this cohort are low



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Despite the complex nature, complications in this cohort are low

TORS assisted approach:

- Yields acceptable functional outcomes (and perhaps improved compared to historical controls)
- Affords better margin control than blind pharyngotomy



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Despite the complex nature, complications in this cohort are low

TORS assisted approach:

- Yields acceptable functional outcomes (and perhaps improved compared to historical controls)
- Affords better margin control than blind pharyngotomy

TORS assisted oropharyngectomy with free flap reconstruction is a safe and effective alternative to traditional open approaches

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Thanks!

Z-Hye Lee, MD
Neil Gross, MD
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Questions?



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