Free Flap Reconstruction in Salvage Laryngectomy: Surgical and Functional Outcomes in a Multi-Institutional Study

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Background

- Salvage laryngectomy is plagued by the long term effects of radiation therapy. These include micro and macro circulatory deficiencies, excessive scarring and an inhibition of wound healing. As a result, many patients experience delays in wound healing such as pharyngocutaneous fistula and wound breakdown. Many also experience long term dysfunction as a result of excess scarring such as pharyngocutanous stricture.

- After a number of studies including a multi-institutional review (U Patel et al), it has become standard of care in most institutions to add non-radiated, vascularized tissue to the pharyngeal reconstruction/closure. However, the optimal tissue to use is unknown.

AIM: *To determine the rate of fistula and pharyngeal stricture as well as long term swallowing and speech outcomes in patients undergoing salvage total laryngectomy with free flap reconstruction.*

Methods

- IRB approval: obtained at all 3 sites.

- Setting: 3 academic, tertiary care referral centers: University of Florida, McMaster University and University of Alberta

- Study Design: retrospective review of prospectively collected data from 2013-2020

- Patients: advanced laryngeal cancers undergoing ***salvage*** total laryngectomy and simultaneous free flap reconstruction.

Methods

- Primary Outcome:
  - Rate of Pharyngocutaneous Fistula formation

- Secondary Outcomes:
  - Rate of Pharyngeal Stenosis formation
  - GTube Dependence
  - Oral Diet Achievements
  - Artificial Speech Achievements

Results

Table 1. Fistula and Pharyngeal Stenosis

Variable	N (%)	Fistula N (%)	P-value	Pharyngeal Stricture N (%)	P-value
Patients	350	66 (19%)		84 (24%)	
cT1/T2	95 (27%)	18 (19%)	0.99	22 (23%)	0.98
cT3/T4	255 (73%)	48 (19%)		62 (24%)	
Previous RT					
RT Only	84 (24%)	17 (20%)	0.78	21 (25%)	0.97
Chemo-RT	266 (76%)	49 (18%)		63 (24%)	
Flap					
RFFF	260 (74%)	46 (18%)	0.33	53 (20%)	0.06
ALTF	90 (26%)	20 (22%)		31 (34%)	
Reconstruction					
Patch	301 (86%)	40 (13%)	**0.01**	66 (22%)	**0.03**
Tube	49 (14%)	26 (44%)		18 (37%)	
Age					
≥ 70	140 (40%)	46 (33%)	**0.01**	30 (21%)	0.13
< 70	210 (60%)	20 (10%		54 (26%)	
Current Smoking					
≥ 1 ppd	126 (36%)	44 (35%)	**0.01**	32 (25%)	0.26
< 1 ppd	224 (64%)	22 (10%)		52 (23%)	

Results

Table 2. Secondary Outcomes

Variable	N (%)
Primary RT	296 (95%)
G-Tube Use @ 1 yr	48 (14%)
Full Oral Diet @ 1 yr	291 (83%)
Partial Oral Diet @ 1 yr	59 (17%)
TEP Placement	53 (15%)
Using TEP @ 1 yr	40 (75%)
Not Using TEP @ 1 yr	13 (25%)
Electrolarynx Use	
Using @ 1 yr	217 (62%)
Not Using @ 1 yr	133 (38%)





- Total laryngopharyngectomy defect and tubed ALT Free Flap over a salivary bypass tube.

Conclusion

- Free flap reconstruction in ***salvage*** total laryngectomy offers low rates of fistula and pharyngeal stricture formation.

- Functional outcomes are excellent after 1 year.

- If patient factors allow for ***free tissue transfer***, it should be highly considered.