Laryngeal and pharyngeal reconstruction: A worldwide review of the current guidelines and standards of practice. Does a universal reconstruction algorithm exist?

Mohammad Mohammad, Giannis Dimovelis, Ashraf Mostafa, Aenone Harper Machin.

Abstract:

Introduction: The reconstruction of hypopharynx and larynx post ablative surgery has been always a demanding challenge. Not only the restoration of the anatomy and achieving robust wound healing, but also the complexity of function in the area for the airway and upper digestive tract not to be compromised. Moreover, the age of this group of patients and perioperative radiotherapy adds to the existing obstacles in reconstruction.

The evolution of microsurgery and free tissue transfer replacing the previous gold standard pedicled flaps revolutionized the head and neck reconstruction.

It became a necessity to elicit how far the head and neck reconstruction practice has gone around the globe and what is considered the gold standard technique for reconstruction of each of the defects encountered at the present time.

We performed a systematic review appraising the current head and neck reconstruction practice around the world aiming at concluding the gold standard methods of reconstruction of the defects in this area.

Methods

Search strategy:

Medline using the PubMed interface on 1st of October 2020

Keywords:

[(exp larynx reconstruction) AND pharynx reconstruction AND tumour AND oncology

LIMIT to human.

Results and search outcome:

236 papers were found.

Of which 66 publications in the last 10 years were shortlisted reflecting the most recent practice.

20 of these were identified addressing the reconstructive approach.

Conclusion:

Various reconstructive methods are reliably used in certain indications with comparable results around the globe. We present an unprecedented evidence-based universal algorithm for post ablative surgery reconstruction for the laryngeal and pharyngeal defects.

Defect size	Reconstruction	Pros	Cons
pharyngeal mucosal width remaining >3.5 cm	Primary closure[1]	simple	Risk of stricture
<3.5cm and >1cm	Pectoralis major myocutaneous pedicle flap	Reliable. Versatile workhorse flap. Resistant to radiotherapy.	Donor site co-morbidity. Bulkiness
	Radial forearm free flap	Thin. Long pedicle	Donor site poor cosmetic appearance. Colour mismatch. Hair bearing skin Complex procedure
<1cm	Completion circumferential reconstruction		
Circumferential defect			
Lower anastomosis above the clavicle	Free Jejunal transfer	Useful in case the pulled-up stomach cannot reach the Pharynx	Laparotomy required Anastomosis stricture Swallowing problems due to hyperperistalsis. Wet sounding voice
	Gastro omental free flap		Anastomosis stricture Requires laparotomy Complex procedure. Marked comorbidities

	Tubed radial forearm free flap.	Long pedicle Thin flap Better if tubed over a salivary bypass	High rate of leakage and stricture. Poor function(swallowing&speech) Hair bearing skin Colour mismatch Donor site comorbidity
	Tubed ALT	Large skin/fascia paddle Long pedicle Thin flap	Poor function(swallowing&speech) Hair bearing skin Colour mismatch
Previously untreated cases	Tubed ALT over a salivary bypass tube	Advantages of ALT plus lowest rate of leakage and stenosis with more satisfactory voice and swallow function rehabilitation	
Post chemo/radiotherapy (Salvage) Procedures	GFFs	Omentum can be wrapped around the anastomosis to decrease risk of leakage and fistula	Requires laparotomy Marked comorbidities Complex surgery
	Additional Free flap(ALT)	Resurface the skin in case of extensive radiotherapy damaged skin	Complex surgery Prolonged theatre time
Circumferential defect			
Lower anastomosis below the clavicle	Gastric pull through Colonic transposition flap	Higher reach Can reach oropharynx	5-15% mortality 30-55% morbidity 3-23% fistula rate
Pharyngeocutaneous fistula (PCF)	Vascularized tissue transfer from outside the irradiated area	Decreased PCF rate from 30% by half	Additional surgical procedure
	Sandwich technique	Manage resistant PCF	

Small to medium size defects	Submental flap	Reliable Minimal donor site morbidity Non complicated procedure	Not suitable for larger defects May be not feasible if post radiotherapy