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CASE REPORT

Novel Approach for Profound Dysphagia

Emma Charters [1,2,3] · **Ricketts Virginia** [1] · **Hui-Tsu Hubert Low** [1,2,3,4]

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Introduction

Dysphagia is a common complication of head and neck cancer treatment. Treatment options for head and neck cancer include surgery and/or radiation therapy, which even in the definitive setting, can significantly impact speech and swallow-related quality of life and function. For those who develop recurrence and require salvage surgery, those outcomes are further compromised. Salvage surgical procedures, particularly those involving the naso- or oropharynx, have a high likelihood of developing severe radiation-associated dysphagia due to fibrosis of the oropharyngeal musculature [1]. While dysphagia rehabilitation is effective in the definitive setting, it can have a limited impact when there is inadequate tissue bulk necessary for developing effective propulsive pressure. Novel approaches to addressing the fibrotic-atrophic musculature novel to post-salvage procedures are required to address significant morbidity and increased medical complexity associated with recurrent aspiration pneumonia.

Method

A 73-year-old gentleman who previously had a left soft palate squamous cell carcinoma (SCC), treated with concurrent chemoradiotherapy, presented with a 5-month history of throat discomfort associated with weight loss. Subsequent biopsy confirmed a recurrent SCC involving the left soft palate, left oropharyngeal wall and tongue base.

He underwent a salvage left oropharyngectomy, partial epiglottectomy and excision of soft palate via a mandibulotomy approach, with a concurrent radial forearm free flap (RFFF) reconstruction. At the time of surgery, a pharyngoplasty was performed utilising the remnant pharyngeal muscles, and a PEG tube was inserted. A videofluoroscopy swallow study informed an intensive 10-week dysphagia program comprised of intensive bolus-driven therapy following the protocol that is routinely used in our institution [2]. Despite initial gains, over the next 18 months, there was a progressive atrophy of the volume of the RFFF, resulting in two episodes of clinically significant aspiration pneumonias requiring hospital admission.

Laryngoscopic examination revealed incomplete contact of the tongue base to the neo-pharyngeal wall. We hypothesised that increasing the volume of the RFFF will allow better contact of the tongue base to the neo-pharyngeal wall. Hence, the patient was consented to a fat transfer to the oropharynx via a liposuction fat harvest. Thirty cubic centimetres of fat was harvested from the abdominal fat and infiltrated into the RFFF at the posterior and left oropharynx wall, as well as the soft palate.

One week prior to, and day one post- surgery, a speech pathologist assessed his intraoral anterior, medial and posterior tongue pressure using the Iowa Intraoral Performance Instrument (IOPI); the results of which were correlated to instrumental assessments (fibreoptic endoscopic evaluation of swallowing; FEES), patient and clinician-reported outcome measures.

✉ Emma Charters
Emma.Charters@lh.org.au

[1] Department of , Head and Neck Surgery, Chris O'Brien Lifehouse, 119-143 Missenden Road, Camperdown, NSW 2050, Australia

[2] Sydney School of Health Sciences, Faculty of Medicine and Health, The University of Sydney, Camperdown, NSW 2006, Australia

[3] Sydney Facial Nerve Clinic, Chris O'Brien Lifehouse, 119-143 Missenden Road, Camperdown, NSW 2050, Australia

[4] Department of Otolaryngology–Head & Neck Surgery, Faculty of Medicine and Health Sciences, Macquarie University, Sydney, Australia

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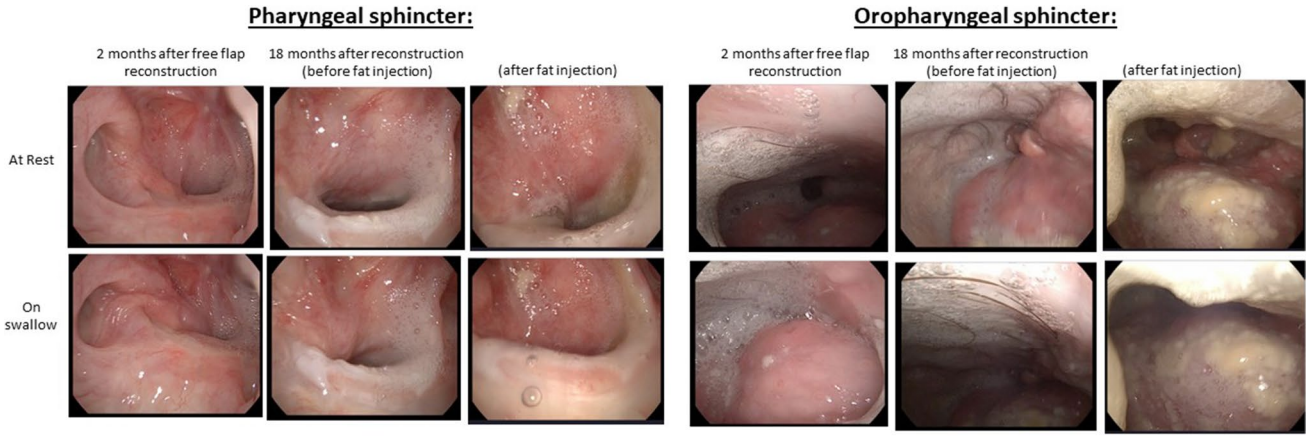

FEES – clinician reported measures

	Pre-injection	Post-injection	4 weeks
Marianjoy Secretion Scale	Profound	Mild	Mild
Murray Secretion Rating	3	1	1
DIGEST	3	1	1
Penetration Aspiration Scale (PAS)			
Secretions	8	2	3
Thin fluid	8	2	2
Mildly thick fluid	8	3	4
Puree	3	2	3

Patient Reported Outcomes

	Pre-injection	Post-injection	4 weeks
SHI	83	69	65
MDADI	31	44	49
EAT-10	30	25	25
PSSHN			
Normalcy of diet	0	30	30
Public eating	0	25	0
Intelligibility	75	75	75
FOIS	1	3	3

IOPI Measurements*

	Pre-injection	Post-injection	4 weeks
Anterior	7	9	8
Middle	4	7	7
Posterior (Lt)	7	10	9
Posterior (Rt)	3	7	7

*average score out of three attempts

Fig. 1 Patient- and clinician-reported outcome measures: Marianjoy Secretion Scale, the Murray Secretion Rating, the Penetration Aspiration Scale and the Dynamic Imaging Grade of Swallowing Toxicity (DIGEST). Secondary outcome measures were patient and clinician rating scales including the MD Anderson Dysphagia Inventory (MDADI), the speech handicap index (SHI), the Eating Assessment Tool (EAT-10), the functional oral intake scale (FOIS) and the performance status scale – head and neck (PSSHN)

The primary outcome measures were instrumental assessments using the IOPI and FEES. IOPI readings were taken from the anterior, middle, and posterior oral cavity.

Results

IOPI scores improved from a mean of 5 kPa pre-op and 8.5 kPa post-operatively. This correlated with improved clinician-rated FEES scoring (Fig. 1). Prior to the fat injection, they presented with severe oropharyngeal dysphagia characterised by no base of the tongue to posterior pharyngeal wall contact, no velopharyngeal closure with the vocal folds obscured by thick secretions throughout the laryngo-pharynx. Following the procedure, the patient was able to achieve the base of tongue to posterior pharyngeal wall contact, velopharyngeal closure, and visibility of the vocal folds was achieved with minimal secretions through the oro- and laryngo-pharynx. PROM and CROM scoring correlated well with instrumental measures. The injection was repeated at 10 weeks post the initial procedure.

Discussion

These results demonstrate that better intra-oral pressure generation leads to improve swallowing outcomes. This can be achieved with strategic fat transfer into the oropharyngeal region, leading to an improvement in oropharyngeal function detectable on instrumental-, clinician- and patient-reported outcome measures. The patient's progress will be monitored closely using the IOPI measure, and the procedure repeated if the kPa drops below 8 kPa.

In conclusion, we have demonstrated that strategic fat transfer to enhance the volume of the pharyngeal walls will facilitate pressure generation and improve food bolus driving through the pharynx. The patient would also require intensive dysphagia therapy to maximise the gains from this procedure. Future research could consider replicating this methodology in a larger sample, followed longitudinally to replicate the results over a larger cohort and evaluate whether changes are maintained over time.

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