Dysphagia following head & neck cancer surgery using the mandibular lingual release approach: A scoping review

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INTRODUCTION

- Swallowing can be altered by head and neck cancer due to tumour size, location and treatment[1]
- Prediction of post-surgical deficits are based on degree of resection, need for reconsturction and **method of surgical approach**[2]
- Large +/- inaccessible oral and oropharyngeal tumours require an open approach such as the mandibular lingual release approach (MLRA)[3]; a critical element of the approach is **division of the suprahyoid muscles** which contribute to airway protection and upper oesophageal opening [4]
- Some authors have raised concerns regarding risks for dysphagia post-MLRA[4-6], however, the **evidence base is extremely limited**

METHODS

AIM: Examination of the current evidence base to determine the extent to which the MLRA may affect post-op swallow outcomes

- **Database:** Five databases (Embase, Medline, CINAHL, PubMed & scopus) were searched for English peer reviewed journals published 1950-April 2020
- **MeSH search terms:** mandibular lingual release, open approach, oral/oropharyngeal cancer, dysphagia, swallow dysfunction / disorder
- **Inclusion criteria:** 1) adults treated surgical, curative intent via MLRA; 2) papers including data +/- discussion of swallowing, mastication, dysphagia; 3) complete scientific articles

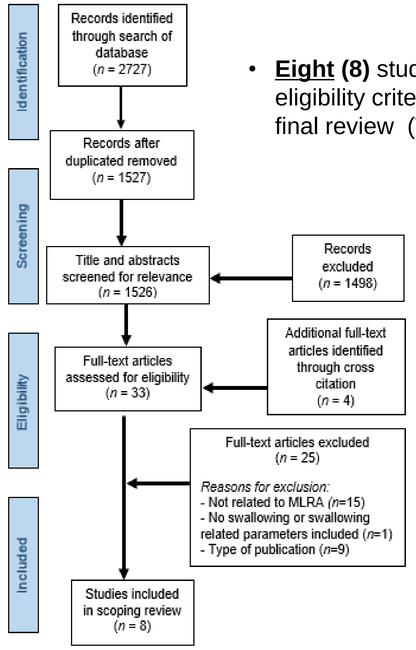

Figure 1 – PRIMSA flow chart

- **Eight (8)** studies met eligibility criteria for the final review (Table 1)

RESULTS

Quality assessment

All studies were:
- Retrospective cohort study design
- Exploratory stage
- Reported subject indicator* & descriptions

- **Four** (44%) papers included one valid and reliable outcome measure
- **Overall all were low quality evidence**

Median quality marker[12] = 2.25/7

Table 1 - Eligible study clinical characteristics (n=8)

Reference	No. cases	New or salvage	Tumour site *	Stage*	Previous tx	Adjuvant tx	Recon
Stanley, 1984 [4]	MLRA 8	N	OC, BOT	T2, T3	NA	MLRA 8	NR
Stringer, 1992 [7]	MLRA 15	N 6 S 9	OC, OP	T1-T4	Definitive RTx	MLRA 5	PC 4 [#] F (NR)
Cilento, 2007 [8]	MLRA 29 LSM 41	S	OC	T4	Definitive RTx	NR	RFFF 41 (all LSM)
Dean, 2000 [6]	MLRA 23	N	Tongue, BOT, FOM, TF, GTS	T2-T4	NA	MLRA 22	NR
Devine, 2001 [5]	MLRA 10 LSM 10	N	Tongue, FOM, Gingiva	NR	NA	MLRA 5	NR
Song, 2013 [9]	MLRA 15 LSM 7	N	Tongue, BOT, FOM	T2-T4	NA	10 [#]	PEC 6 [#]
Li, 2014 [10]	MLRA 26 LSM 30	N	Tongue	T2, T3	NA	LSM 4	NR
Li, 2015 [11]	MLRA 54 LSM 45	New	Tongue, FOM	T2, T3	NA	NR	NR

Abbreviations: N new; S salvage; Recon reconstruction; Tx treatment; BOT base of tongue; FOM floor of mouth; F free flap; GTS glossotonsillar sulci; LSM lip split mandibulotomy; MLRA mandibular lingual release approach; NA not applicable; NR not reported; OC oral cavity; OP oropharyngeal; PEC pectoralis major myocutaneous flap; PC primary closure; RTx radiotherapy; RFFF radial forearm free flap; TF tonsillar fossa;

Note: * data reported for MLRA only; [#] cohort not reported

Study characteristics

- Total MLRA cases described = 180 (Table 1)
- 50% studies = **<20 sample sizes**

Swallow related complaints

- All papers mentioned swallowing
- **Only 4** reported swallowing data (Table 2)
- Data = validated patient questionnaire (*n*=3) or non-standardised questionnaire (*n*=1)
- **NO** instrumental swallow assessments

Table 2 – Swallow reported outcomes

Reference	Follow up (months)*	Swallow function measured	Swallow OCM tool
Stanley, 1984 [4]	NR	No	N/A
Stringer, 1992 [7]	2–50	No	N/A
Cilento, 2007 [8]	33.4	No	N/A
Dean, 2000 [6]	8–32	No	N/A
Devine, 2001 [5]	8-54	Yes	UWQoL
Song, 2013 [9]	9-46 (∞=6)	Yes	SAS
Li, 2014 [10]	6– 60	Yes	UWQoL
Li, 2015 [11]	16.5– 51.8 (∞=12)	Yes	UWQoL

Abbreviations: NA not applicable; NR not reported; OCM outcome measure; SAS swallow ability scale; UWQoL University of Washington quality of life assessment

Note: * MLRA cases only; ∞= timing of swallow outcome measure

Changes to swallow biomechanics

Functional changes to physiological mechanisms of swallowing considered by **3 papers:**

1. Detachment of FOM musculature = **shallow FOM affecting mastication** [4]
2. Integrity of oral diaphragm (vital for swallowing and chewing) may be **compromised** even with careful reattachment of geniohyoid & genioglossus [5]
3. Detachment of FOM musculature may = **post-op lingual dysfunction** [6]

KEY FINDINGS

- Papers emphasise **presence of swallow deficits** post-MLRA
- Consensus amongst 3 authors for **potential impaired swallowing** due to **division and reattachment of the FOM musculature**
- Method of surgical closure may be a predictor of worse outcomes
- BUT **small** numbers and **heterogeneity in methodology** prohibit conclusion regarding incidence and nature of dysphagia
- No study conducted specific investigation of swallowing biomechanics

Limitations

- Data extraction may have been limited by exclusion of non-English publication due to translation costs
- Use of heterogeneous descriptors in this field may have caused some papers to be missed

Conclusions

- Restricted understanding of incidence, causes and characteristics of dysphagia is this group
- Essential knowledge is needed to understand the drivers for altered swallow biomechanics in order to inform clinical pathways and speech pathology interventions
- Further prospective research is needed using standard clinical & instrumental measures of swallow function

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