Case report

Lymphedema of Tongue: Management, Evaluation, and Outcomes - A Case Report

A Case Report on the Treatment, Assessment, and Results of Tongue Lymphedema

Abstract

Lymphedema is a chronic, progressive condition of the lymphatic system characterized by inflammation, fibro-adipose tissue deposition, and impaired lymphatic drainage, leading to the pathological accumulation of protein-rich interstitial fluid. This case report presents the evaluation and conservative management of a patient with post-treatment lymphedema of the tongue following surgery and adjuvant radiotherapy for squamous cell carcinoma of the alveolar ridge, the outcomes observed, and the challenges faced in the management. The patient was treated using the principles of Complete Decongestive Therapy (CDT), a multimodal approach traditionally used in extremity lymphedema. Manual lymphatic drainage (MLD) techniques were applied regularly, targeting lymphatic clearance to the axillary and cervical nodes. This case emphasizes the need for innovation in applying compression techniques in nontraditional areas. The use of customized chin supports and sleep-positioning devices reflects the evolving strategies in managing internal lymphedema. Sleep disturbances, a frequently overlooked symptom, were markedly reduced, suggesting that tongue positioning influences airway patency and comfort. This case underscores the importance of early rehabilitation using decongestive techniques, tailored positioning, and consistent monitoring. Regular therapeutic engagement was essential in reducing tongue protrusion, improving quality of life, and preventing complications such as fibrosis and disuse atrophy. Future research is needed to develop standardized assessment tools and intervention protocols specifically for intraoral lymphedema.

Introduction

Lymphedema is a chronic, progressive condition of the lymphatic system characterized by inflammation, fibro adipose tissue deposition, and impaired lymphatic drainage, leading to the pathological accumulation of protein-rich interstitial fluid (Bowman & Rockson, 2024). It can be

categorized as primary or secondary, with the latter resulting from damage or obstruction of lymphatic vessels due to malignancy, infection, trauma, or therapeutic interventions. In individuals treated for head and neck cancers, secondary head and neck lymphedema (SHNL) is a common but often under-recognized complication. It results primarily from disruption of lymphatic pathways due to surgery and/or radiation therapy, which impairs the lymphatic system's ability to drain fluid, clinically manifesting as persistent soft tissue swelling.

Fibrosis, often associated with lymphedema, involves excessive collagen deposition and hardening of tissues, reducing their elasticity and function. These complications—though prevalent are frequently underestimated in clinical significance, despite their impact on patients' physical function, speech, mastication, and psychosocial well-being (Deng et al., 2019). In head and neck cancer patients, edema can affect both external and internal tissues, including the oral cavity, pharynx, and larynx. This leads to difficulty in swallowing, changes in voice quality, impaired articulation, and compromised airway function. The reported incidence of SHNL ranges from 12% to 54% among patients treated for head and neck malignancies (Anand et al., 2018).

Lingual lymphedema, in particular, poses unique challenges due to the critical role of the tongue in oral motor functions. Intraoral swelling limits range of motion, alters tongue posture, and may affect breathing patterns and sleep quality. While extremity lymphedema is extensively studied and treated, internal oral lymphedema, especially involving the tongue, remains a less frequently addressed domain. Comprehensive rehabilitation protocols specific to lingual involvement are lacking, requiring clinicians to adapt existing strategies to this rare presentation.

This case report presents the evaluation and conservative management of a patient with post-treatment lymphedema of the tongue following surgery and adjuvant radiotherapy for squamous cell carcinoma of the alveolar ridge, the outcomes observed, and the challenges faced in the management.

Case Observation

A 58-year-old male, previously diagnosed with squamous cell carcinoma of the lower alveolus, underwent a segmental mandibulectomy with lymph node dissection and free flap reconstruction, followed by 30 fractions of adjuvant radiotherapy. A few months post-operatively, he presented with severe edematous tongue & protruding out. There was no evidence of disease recurrence, and no palpable lymphadenopathy was noted. He was referred to the Occupational Therapy Department in August 2024 for rehabilitation due to increasing discomfort, difficulty in speech, and impaired oral intake.

Initial clinical examination revealed significant tongue swelling and fibrosis in the cervical region, with moderate restrictions in neck extension, lateral flexion, and rotation. Tongue mobility was severely restricted, with nearly nil capacity for protrusion or retraction. This resulted in difficulty maintaining oral hygiene, oral intake, impaired mastication, and slurred speech. The

patient reported disturbed sleep due to discomfort from tongue protrusion and a persistent sense of heaviness in the neck. Measurements were documented using circumferential tape and photographic records for visual tracking of changes in tongue size and position over time.

A subjective evaluation of function and symptoms was performed using a combination of patient-reported outcome measures, including the EORTC QLQ-C30 and a symptom-specific diary tracking eating ability, sleep quality, speech clarity, and tongue posture.

Intervention

The patient was treated using the principles of Complete Decongestive Therapy (CDT), a multimodal approach traditionally used in extremity lymphedema. Manual lymphatic drainage (MLD) techniques were applied regularly, targeting lymphatic clearance to the axillary and cervical nodes. Intraoral lymphatic drainage was integrated, focusing on stimulating lymphatic pathways within the floor of the mouth and lateral aspects of the tongue. External MLD included strokes directed toward the supraclavicular nodes, ensuring effective drainage.

Compression therapy, although challenging in the oral region, was approximated using gentle intraoral pressure techniques and anterior positional support during rest and sleep. Tongue exercises, including elevation, lateral movement, protrusion-retraction cycles, and progressive strengthening program for tongue, were prescribed regularly to improve muscle strength. Skin care & Positioning during sleep were also part of routine protocol. Postural education emphasized forward head posture correction, and sleeping in an inclined supine position with chin support to minimize tongue protrusion.

Oral hygiene maintenance was encouraged through frequent rinses, gentle brushing, and the use of oral gels to prevent mucosal irritation. The therapy plan also incorporated breathing exercises, jaw mobilization routines, and speech articulation drills in collaboration with the speech-language pathology team.

Outcomes

Intervention over a period of 9 months from baseline evaluation demonstrated a moderate reduction in tongue edema, evidenced by circumferential measurements and moderately improved appearance of tongue. The subject reported a subjective reduction in tongue heaviness. Additionally, functional improvements including being able to lie longer in supine position and in side lying position were observed.

Tongue mobility improved, especially in retraction and lateral deviation. These gains allowed

better manipulation of food bolus and enhanced clarity in speech. The patient showed greater capacity to retain the tongue intraorally during conversation and meals. The absence of mandibular reconstruction continued to limit complete containment of the tongue. The application of anterior compression using customized chin and oral support was useful to a small extent. Improvement in sleep quality was noted, with the patient reporting the ability to sleep supine for longer durations without discomfort.

The EORTC QLQ-C30 questionnaire used at baseline, 3 months, 6 months and at 9 months showed improvements in global health status, sleep, and social functioning. No recurrence of significant edema was noted during regular follow-up. The patient demonstrated moderate adherence to the home program, reinforcing the importance of patient education and motivation in chronic condition management.

Table 1. Treatment outcome measures of lymphedema from baseline to 9months

Outcome Measures	Baseline	3 months	6 months	9 months
Tongue circumference around widest part (cm)	12.5	11	10.5	9.5
Tongue protrusion (cm)	4.5	4	2.8	2.3
Ability to lie supine (Hours)	0.2	1.5	3	5-6
Speech clarity (scale 1–5)	2	2.5	3.3	3.5

Combined EORTC QLQ-C30 & QLQ-H&N43 Scores Over Time

Patient with Tongue Lymphedema – High Functioning, Oral Symptom Burden, and Stable Non-Symptomatic Weight Loss

Table 2. The table showed The EORTC QLQ-C30 questionnaire used at baseline, 3 months, 6 months and at 9 months

Domain EORTC QLQ-C30 – Functioning	**Baseline**	**3 Months**	**6 Months**	**9 Months**
Physical Functioning	66.7	73.3	86.6	100.0
Role Functioning	83.3	83.3	100.0	100.0

Emotional Functioning	66.7	91.6	100.0	100.0
Cognitive Functioning	50.0	83.3	100.0	100.0
Social Functioning	16.7	33.3	66.6	66.6
Global Health Status / QoL	50.0	50.0	66.6	83.33
EORTC QLQ-C30 – Symptoms				
Fatigue	33.3	0.0	0.0	0.0
Nausea/Vomiting	16.7	0.0	0.0	0.0
Pain	50.0	50.0	16.6	16.6
Dyspnea	0.0	0.0	0.0	0.0
Insomnia	100.0	66.6	33.3	33.3
Appetite Loss	33.3	0.0	0.0	0.0
Constipation	33.3	33.3	0.0	0.0
Diarrhea	0.0	0.0	0.0	0.0
Financial Difficulties	100.0	100.0	66.6	33.3
EORTC QLQ-H&N35– Head & Neck				
Pain (31, 32)	66.7	66.7	33.3	33.3
Swallowing (33,34,35,36, 37,38,49)	76.4	66.7	47.8	33.3
Senses (43, 44)	50.0	16.7	16.7	16.7
Social Eating (50, 51,52)	100.0	88.9	66.7	55.6
Social contact (53, 54,55,56,57,58)	72.2	55.6	55.6	22.2
Less sexuality (59,60)	53.3	33.3	33.3	33.3
Teeth problems (39)	33.3	33.3	0.0	0.0
Mouth Opening Difficulty (40)	66.7	66.7	33.3	33.3
Dry Mouth (41)	33.3	0.0	0.0	0.0
Sticky Saliva (42)	100.0	100.0	66.7	33.3
Cough (45,46)	33.3	0.0	0.0	33.3
Felt ill (47)	33.3	0.0	0.0	0.0
Appearance (48)	100.0	100.0	66.7	0.0
Use of Pain Killers (61)	100.0	100.0	100.0	0.0

Use of Nutritional Supplements (62)	100.0	100.0	100.0	100.0
Use of Feeding Tube (63)	0.0	0.0	0.0	0.0
Weight Loss (non-symptomatic) (64)	100.0	0.0	0.0	0.0
Weight Gain (65)	0.0	0.0	0.0	0.0

Baseline Photograph Outcome and Results at 9 months

Fig. 1. **Lymphedema treatment**

Discussion

Lymphedema is a complex, multifactorial condition that demands a multidisciplinary and patient-tailored approach. Tongue lymphedema, although less prevalent, has disproportionately higher impact due to the orofacial region's dense vascular and muscular anatomy. As seen in this case, early recognition and intervention are critical. The principles of CDT, while well-established for limb lymphedema, must be thoughtfully adapted for intraoral tissues. The combination of MLD with tongue mobility exercises showed promising results, even in the presence of irreversible anatomical changes such as a segmental mandibulectomy.

Furthermore, this case emphasizes the need for innovation in applying compression techniques in nontraditional areas. The use of customized chin supports and sleep-positioning devices reflects the evolving strategies in managing internal lymphedema. Sleep disturbances, a frequently overlooked symptom, were markedly reduced, suggesting that tongue positioning influences airway patency and comfort.

Another important consideration is the psychosocial burden of lingual lymphedema. Functional difficulties in speech and feeding often translate to social withdrawal and reduced quality of life. This case showed subjective gains in confidence and social reintegration, an outcome as significant as anatomical or functional improvement. Psychological support and counseling should be integrated into the treatment paradigm where feasible.

It is also worth noting that sustained gains were closely linked to high patient compliance, facilitated by detailed education, visual feedback through progress photos, and family involvement. Adherence to a home-based program is essential in chronic cases, especially where healthcare access is limited. Ongoing monitoring with outcome tools like the EORTC QLQ-C30, visual analog scales for pain/discomfort, and speech clarity assessments can help quantify and guide long-term care.

Conclusion

Tongue lymphedema presents diagnostic and therapeutic challenges due to its uncommon presentation and the functional complexity of the orofacial region. This case underscores the importance of early rehabilitation using decongestive techniques, tailored positioning, and consistent monitoring. Regular therapeutic engagement was essential in reducing tongue protrusion, improving quality of life, and preventing complications such as fibrosis and disuse atrophy.

Future research is needed to develop standardized assessment tools and intervention protocols specifically for intraoral lymphedema. Clinicians should be vigilant in monitoring patients post-head and neck cancer therapy for early signs of lingual swelling and initiate timely referrals to rehabilitation services. Interdisciplinary collaboration remains vital in achieving comprehensive, patient-centered outcomes in lymphedema management.

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