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Physiotherapy

KEY WORDS: Hemiglossectomy; Modified Radical Neck Dissection; Radial Forearm Free Flap; Physiotherapy Rehabilitation; Trismus; Temporomandibular Joint Contracture; Cervical Stiffness; Oral Cancer; Postoperative Rehabilitation.

CASE REPORT: POSTOPERATIVE RIGHT HEMIGLOSSECTOMY WITH MODIFIED RADICAL NECK DISSECTION AND RADIAL FOREARM FLAP RECONSTRUCTION — COMPREHENSIVE PHYSIOTHERAPY REHABILITATION

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ABSTRACT

A 55-year-old male underwent right hemiglossectomy with modified radical neck dissection and radial forearm free flap reconstruction for squamous cell carcinoma of the lateral tongue on 23 May 2025. Following adjuvant chemotherapy and radiotherapy, he presented with neck stiffness, forward head posture and significant trismus due to temporomandibular joint (TMJ) contracture and radiation-induced fibrosis. A structured physiotherapy rehabilitation program was implemented, including TMJ mobilization (lateral, superior and inferior glides), sternocleidomastoid muscle stretching, cervical isometric exercises, shoulder joint stretching, manual jaw opening with a Hiester jaw opener, and buccal mucosa stretching and strengthening exercises. This case report elaborates on the phase-wise physiotherapy intervention, documents clinical progress over six months, and discusses the outcomes and implications for functional recovery. Objective measures demonstrated improvement in mouth opening, cervical range of motion, shoulder mobility, and quality of life, highlighting the importance of early and targeted physiotherapy in head and neck oncologic patients.

INTRODUCTION

Oral cavity squamous cell carcinoma is a common malignancy worldwide, often necessitating surgical excision with neck dissection for regional control. Hemiglossectomy combined with modified radical neck dissection (MRND) and flap reconstruction is frequently employed for functional and aesthetic restoration. While MRND preserves non-lymphatic structures such as the spinal accessory nerve, patients often develop postoperative neck stiffness and shoulder dysfunction. Similarly, flap donor sites, such as the distal radial forearm, may result in wrist stiffness and reduced hand strength, requiring rehabilitation. Trismus, defined as limited mouth opening, arises from TMJ contracture, soft tissue fibrosis, and post-radiotherapy changes, and can significantly impact mastication, speech, and oral hygiene.

Physiotherapy plays a pivotal role in restoring functional outcomes following head and neck cancer surgery. Early intervention targeting TMJ mobilization, cervical spine and shoulder mobility, and donor site function can mitigate secondary complications. This case report describes the comprehensive physiotherapy management of a patient presenting with TMJ contracture and cervical stiffness following right hemiglossectomy with MRND and radial forearm flap reconstruction, detailing the techniques employed and functional outcomes over six months.

Case Presentation

A 55-year-old male presented with a biopsy-proven squamous cell carcinoma on the right lateral tongue. Preoperative evaluation revealed ipsilateral cervical lymph node involvement. The patient underwent right hemiglossectomy with MRND and immediate reconstruction using a left distal radial forearm free flap on 23 May 2025. The donor site was closed with a split-thickness skin graft and immobilized postoperatively. The patient subsequently received adjuvant chemotherapy and radiotherapy as per the multidisciplinary tumor board recommendations.

Eight weeks following adjuvant therapy, the patient reported neck stiffness, limited cervical rotation and lateral flexion, reduced shoulder elevation, and severe trismus with inter-incisal opening of 16 mm. The mandible deviated towards the operated side on opening, and lateral excursions were limited to 3–4 mm. The donor forearm exhibited mild hypersensitivity and reduced wrist extension. The patient experienced difficulty in mastication, speech articulation, and maintaining oral hygiene.

Investigations

Preoperative imaging confirmed the primary tongue lesion and ipsilateral nodal involvement, while postoperative surveillance revealed no recurrence or distant metastasis. Functional assessment for rehabilitation included maximal inter-incisal opening measured with calipers, cervical range of motion (goniometry), shoulder range of motion, donor-site grip strength, and patient-reported outcome measures such as the DASH questionnaire for upper-limb function.

Physiotherapy Management

The physiotherapy rehabilitation program was designed as a

structured, phase-wise protocol, progressively increasing intensity while respecting tissue healing and post-radiotherapy constraints. Phase I (0–2 weeks) focused on pain management, gentle cervical and shoulder mobilization, and early jaw exercises using assisted techniques. Phase II (2–6 weeks) introduced TMJ mobilization, manual jaw opening using the Hiester jaw opener, sternocleidomastoid stretching, cervical isometrics, and buccal mucosa stretching and strengthening. Shoulder joint stretching was incorporated progressively to restore elevation and scapular stability. Phase III (6–12 weeks) emphasized advanced TMJ glides (lateral, superior, inferior), myofascial release of the cervical fascia, functional mastication training, progressive cervical and shoulder strengthening, and donor forearm exercises including tendon gliding, grip strengthening, and proprioceptive training. Phase IV (beyond 12 weeks) focuses on functional integration, postural correction, home exercise adherence, and maintenance of gains in mouth opening, cervical mobility, and donor site function.

Adjunctive modalities included moist heat before stretching, TENS for pain modulation, and clinician-administered ultrasound for scar tissue modulation. Kinesiology taping supported lymphatic return and postural alignment. The patient was educated on home exercises, progression guidelines, flap care, oral hygiene, and safe mastication strategies.

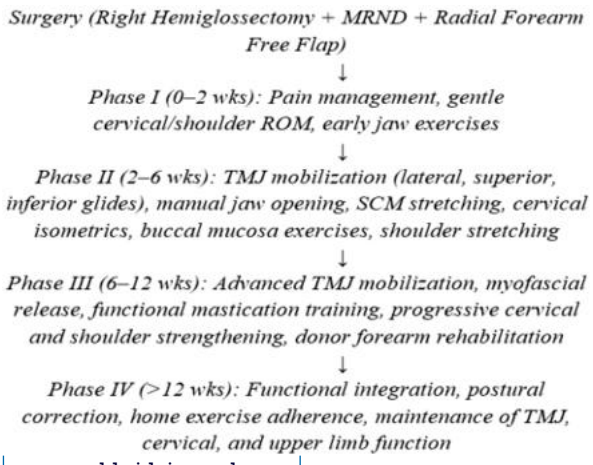
Outcomes

Over a six-month period, inter-incisal mouth opening improved from 16 mm to 35 mm, lateral excursions normalized to 7–8 mm, and mandibular deviation decreased. Cervical range of motion improved to 85–90% of normal values, shoulder elevation was restored, and donor forearm grip strength reached near-normal levels. Patient-reported pain decreased, DASH scores improved significantly, and quality of life was enhanced with resuming social and dietary activities. No adverse events related to physiotherapy were observed.

DISCUSSION

Postoperative trismus and cervical stiffness result from a combination of surgical scarring, TMJ contracture, and radiation-induced fibroatrophic changes. Evidence supports early intervention with TMJ mobilization, myofascial release, cervical and shoulder exercises, and donor site rehabilitation to restore function. The structured phase-wise physiotherapy approach in this patient led to substantial improvements in functional outcomes and quality of life. The use of objective measures facilitated monitoring of progress, while home exercise adherence and multidisciplinary coordination optimized long-term outcomes. This case underscores the importance of early, targeted, and progressive physiotherapy in head and neck cancer patients undergoing complex reconstructive surgery.

Flowchart: Rehabilitation Timeline and Interventions



Learning Points: Early, structured, phase-wise physiotherapy is essential for preventing and treating postoperative trismus, cervical stiffness, and donor-site dysfunction in head and neck cancer patients. Combined manual therapy, targeted mobilization, and functional retraining significantly improve mouth opening, cervical mobility, shoulder function, and quality of life.

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