



Prosthetic Management of Flap-Related Complications Following Glossectomy in Locally Advanced Tongue Cancer

Kiran Jagtiani¹ Prachi Bhatia¹ Radhika Jain¹ Gurkaran Preet Singh¹ Sandeep Gurav¹

¹Department of Dental and Prosthetic Surgery, Tata Memorial Hospital, Parel, Mumbai, India

Address for correspondence Sandeep Gurav, BDS, MDS (Prosthodontics and Implantology), Department of Dental and Prosthetic Surgery, Homi Bhabha Block, Tata Memorial Hospital, Dr. E Borges Road, Parel, Mumbai 400 012, India (e-mail: drsandeepgurav@gmail.com).

Indian J Plast Surg 2023;56:382–385.

Abstract

Total glossectomy defects resulting from postoncologic resection are commonly reconstructed with locoregional or free flaps. However, effectively managing complications that may arise after reconstruction can be a significant challenge. We present a unique case series describing prosthetic management of flap-related complications following glossectomy in patients treated for locally advanced tongue cancer. Three patients underwent total glossectomy, neck dissection, reconstruction using free flap, and tracheostomy. Two patients developed an intraoral fistula located in the anterior region of the floor of the mouth. The third patient developed a flap failure requiring a second procedure using a pectoralis major myocutaneous flap for correction of the orocutaneous fistula that ultimately did not heal. Mandibular obturator prostheses lined with a soft liner were fabricated for all the patients, which helped reduce salivary incontinence and improve swallowing and speech. This case series highlights that a collaborative interdisciplinary team approach is crucial for optimizing postoperative function and outcomes when managing complications from reconstructive procedures.

Keywords

- ▶ tongue reconstruction
- ▶ free flap
- ▶ postoperative complications
- ▶ obturator

Introduction

Squamous cell carcinoma (SCC) of the tongue is the most prevalent malignant neoplasm within the oral cavity in developing countries.¹ The intricate motor activity and sensory feedback controlled by the highly specialized tissues of the tongue render it a considerably challenging structure to reconstruct by the head and neck surgeons.² Total glossectomy defects, resulting from postoncologic resection of the tongue, are commonly reconstructed with locoregional or free flaps.^{3,4} Untoward outcomes following microsurgical reconstruction of the tongue such as inadequate neo-tongue volume, strictures or tethering of the tongue, flap loss, infection, and orocutaneous fistula (OCF) can affect oral

feeding, speech, and overall quality of life.^{5,6} Additionally, these complications can delay the initiation of adjuvant therapy, hamper oral feeding, and increase treatment costs, length of hospital stay, and risk of carotid blowout.⁷ The management of a fistula in the floor of the mouth primarily involves local wound care, irrigation, and debridement procedures to ensure that the wound is clean prior to secondary reconstruction.⁸ In the cases with evidence of pus discharge, culture-directed antibiotic treatment is also indicated.^{6,8} However, in the setting of recent radiation therapy, the tissues are poorly vascularized and fibrotic, the mobility of soft tissue may be restricted, and delayed healing decreases the likelihood of a successful secondary reconstruction.⁹ Frequently, prosthetic appliances have been used in the

DOI <https://doi.org/10.1055/s-0043-1772455>.
ISSN 0970-0358.

© 2023. Association of Plastic Surgeons of India. All rights reserved. This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial-License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)
Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

management of these complications to create a barrier and seal the oral cavity from the external environment.⁸

To the best of our knowledge, this is the only case series that describes prosthetic management of flap-related complications following glossectomy in three patients treated for locally advanced tongue cancer. This unique approach offers an alternative for optimizing postoperative function and outcomes, particularly in the cases where immediate secondary reconstruction is not feasible.

Case Series

We present a case series of three patients who developed flap-related complications following glossectomy for the treatment of locally advanced tongue cancer (→Table 1). Two patients underwent total glossectomy, bilateral selective neck dissection, reconstruction using free anterolateral thigh flap, and tracheostomy. Patients 1 and 2 also received adjuvant radiation therapy. The third patient underwent right partial glossectomy, right neck dissection reconstruction using free radial forearm flap, and tracheostomy. Patients 1 and 2 developed an intraoral fistula tract located in the anterior region of the floor of the mouth, with no purulent discharge, 2 and 5 months postradiation therapy, respectively (→Figs. 1a and 2a). Patient 3 developed discoloration and gaping in the anterior margin of the flap inset with purulent discharge necessitating exploration and use of pectoralis major myocutaneous flap for correction of the OCF. However, it did not resolve the issue and a second procedure using pectoralis major myocutaneous flap was performed for correction of the OCF that ultimately did not heal (→Fig. 3a). None of the patients had any extraoral communication or exposed bone as shown in the preoperative photographs (→Figs. 1a, 2a, and 3a).

Owing to recent history of radiotherapy in patients 1 and 2 as well as occurrence of flap failure in patient 3, the primary treating oncologists did not recommend further secondary reconstruction for the management of the fistula. Hence, prosthetic treatment was sought instead. We planned an acrylic-based mandibular obturator prosthesis lined with a

soft liner for all three cases to address the problem of accumulation of food debris, saliva pooling, and malodor. Lower arch impressions were recorded in a maxillary tray, master casts made, and cold cure acrylic resin base retained using continuous wire clasp, and C-clasps were fabricated for each patient. A try-in was done to evaluate the fit (→Figs. 1b, 2b, and 3b). Consequently, a low fusing compound was added to intaglio surface to accurately capture the extent of the defect. Finally, each prosthesis was processed in a heat cure acrylic resin. The prostheses were lined with a soft liner chair-side and delivered to the patients (→Figs. 1c, 2c, and 3c). The patients and caregivers were provided with detailed instructions regarding the use and maintenance of the prostheses. After a comprehensive assessment conducted by the speech and swallowing therapist, the patients were gradually introduced to an appropriate oral diet. Regular follow-up appointments were scheduled at 1 week, 1 month, and every 3 months for 1 year. The acrylic-based mandibular obturator prostheses were well tolerated by all three patients and helped reduce salivary incontinence, improve deglutition and articulation, enabled return to oral feeding.

Discussion

Managing the development of flap-related complications can be challenging, and the formation of a fistula subsequent to free flap reconstruction for the tongue is significantly correlated with factors such as cachexia, advanced tumor stage (T4), complete resection of the floor of the mouth, and surgical site infection.^{7,9} To prevent fistula formation, a reliable and suitably sized skin paddle, along with multilayer mattress sutures that distribute tension are imperative to minimize tear of the suture line, dehiscence, and fistula.^{3,4} Fistulas and infections frequently coexist, creating a harmful pattern where one issue can trigger the other.^{6,7} Prompt and effective treatment of infections is crucial to minimize the development of a fistula.⁹ The appropriate management approach for flap-related complications can be determined based on their presentation. Typically, patients may require

Table 1 Summary of patient characteristics and surgical interventions (n = 3)

Sl no.	Age/sex	Primary diagnosis	Surgical intervention	Adjuvant radiotherapy
Case 1	44 y/male	Carcinoma of the tongue pT4apN2a	Total glossectomy, bilateral neck dissection, reconstruction using free anterolateral thigh flap, and tracheostomy	EBRT to bilateral face and neck to a dose of 56.25 Gy, 25 fractions at 2.25 Gy per fraction
Case 2	59 y/male	Carcinoma of the left lateral border of the tongue pT3pN0cM0	Total glossectomy, bilateral selective neck dissection, reconstruction using free anterolateral thigh flap, and tracheostomy	EBRT to B/L face neck to a dose of 60 Gy, 30 fractions while respecting normal tissue tolerance
Case 3	67 y/female	Carcinoma of the right lateral border of the tongue T4aN3b	Right partial glossectomy, right neck dissection reconstruction using free radial forearm flap (FRAFF), and tracheostomy	No adjuvant radiotherapy received at the time of OCF presentation

Abbreviation: EBRT, external beam radiotherapy; OCF, orocutaneous fistula.

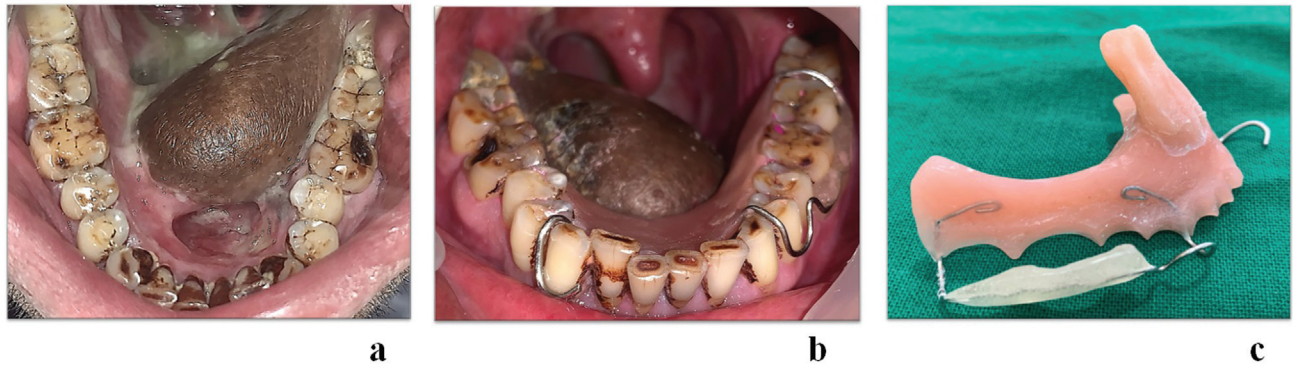


Fig. 1 Case 1. (a) Preoperative photograph. (b) Postoperative mandibular obturator in situ. (c) Mandibular obturator prosthesis (acrylic plate and bulb relined with a soft liner).

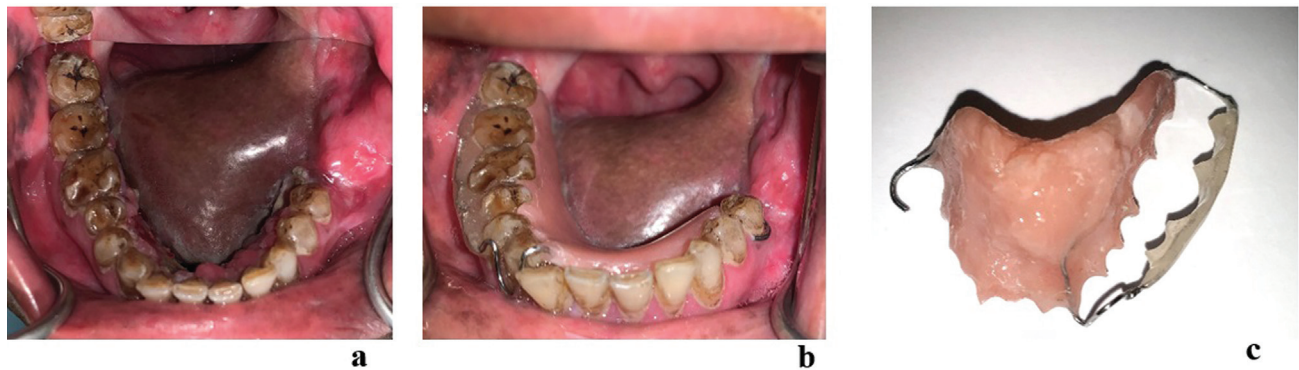


Fig. 2 Case 2. (a) Preoperative photograph. (b) Postoperative mandibular obturator in situ. (c) Mandibular obturator prosthesis (acrylic plate relined with a soft liner).

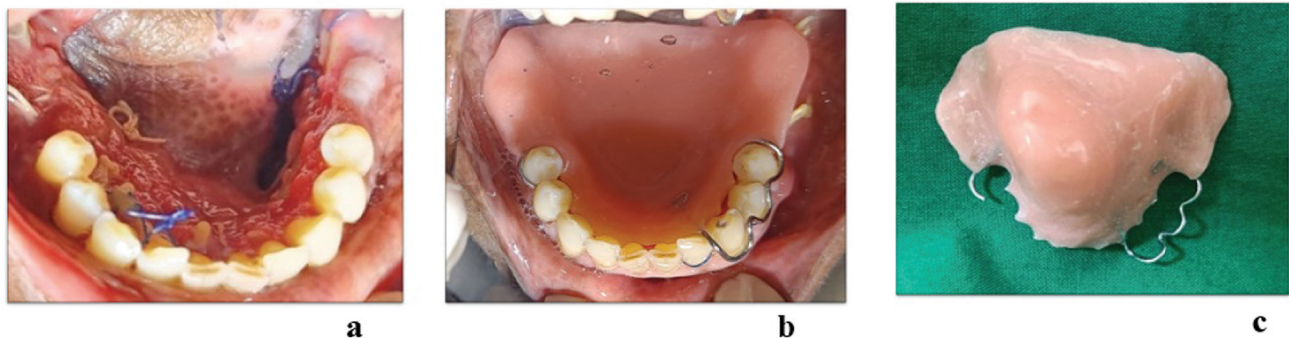


Fig. 3 Case 3. (a) Preoperative photograph. (b) Postoperative mandibular obturator in situ. (c) Mandibular obturator prosthesis (acrylic plate relined with a soft liner).

adequate debridement, flap inset adjustment, and wound repair.^{10,11} If a significant portion of the flap is debrided, and the wound cannot be closed, a second free flap or regional flap should be planned, taking into consideration the prognosis, tissue quality, and fistula size.^{6,10}

In the cases where a fistula presents immediately following radiotherapy, it is crucial to manage the wound less aggressively with adequate wound care to prevent infection and minimize fibrosis.⁶ At this stage, it is essential to provide reassurance to the patient who may be experiencing pain and discomfort due to the wound condition. In the event of a

fistula occurring weeks later after radiotherapy, it is preferable to wait until the tissue settles and inflammation subsides before deciding on the appropriate reconstructive course and options.^{6,10}

Khoo and Ooi¹¹ in their systematic review of current practices of management of postreconstructive head and neck salivary fistulas recommend that fistulas that are diagnosed early after oncological surgery be treated with a trial of conservative management for fistulas that demonstrate good wound healing potential. They described conservative management options that included conventional wound care and

negative pressure wound therapy (NPWT). NPWT works by creating a vacuum seal, effectively eliminates the dead space, and prevents salivary leaks around the fistula. Prosthetic appliances are designed to replace missing structure and restore function, aesthetics, and quality of life for individuals with oral defects or conditions. Typically, employing a prosthodontic appliance can aid in promoting wound healing by prevention of contamination and bacterial growth, prevention of potential disruption of the healing tissues, stimulating the growth of granulation tissue, and improving oral function, including swallowing and speech.^{8,11} This approach is particularly valuable in the cases where a secondary flap surgery to repair a fistula carries the risks of infection, donor site morbidity, flap failure, or the development of another fistula or recurrence of the original fistula.

Ultimately, the quality of tissue, size of the fistula, time elapsed since radiotherapy, surgeon's preference, and patient's general condition determine the course of action.⁷ In certain circumstances, it may be more effective to employ a prosthodontic appliance for patient rehabilitation until sufficient tissue healing has taken place and the effects of radiotherapy have diminished. The prosthetic management reported in this case series was unique and successfully overcame the therapeutic challenges in managing flap-related complications for patients who were not ideal candidates for additional invasive surgical interventions.

Conclusion

The use of an acrylic-based mandibular obturator prostheses in our case series, similar to a maxillary obturator, applied gentle pressure, eliminated dead space, avoided additional surgical morbidity, and allowed early return to normal oral functions, particularly in the cases where immediate secondary reconstruction was not feasible. Prosthesis care was simple and easy to perform by all the patients. To achieve rehabilitation goals, open collaboration between ablative surgeons, reconstructive surgeons, radiation oncologists, and maxillofacial prosthodontists is of utmost importance. Such an alliance will help advance toward the most effective rehabilitation approach for the patient.

Conflict of Interest

None declared.

Acknowledgments

The authors would like to thank our Dental Technicians (Maxillofacial) Mrs. Arti Shinde and Mr. Sagar Kulthe at Tata Memorial Hospital for their support and assistance in the laboratory steps.

References

- Miranda-Filho A, Bray F. Global patterns and trends in cancers of the lip, tongue and mouth. *Oral Oncol* 2020;102:104551
- Urken ML, Moscoso JF, Lawson W, Biller HF. A systematic approach to functional reconstruction of the oral cavity following partial and total glossectomy. *Arch Otolaryngol Head Neck Surg* 1994;120(06):589-601
- Mazarro A, de Pablo A, Puiggròs C, et al. Indications, reconstructive techniques, and results for total glossectomy. *Head Neck* 2016;38(Suppl 1):E2004-E2010
- Haughey BH. Tongue reconstruction: concepts and practice. *Laryngoscope* 1993;103(10):1132-1141
- Cannady SB, Hatten K, Wax MK. Postoperative controversies in the management of free flap surgery in the head and neck. *Facial Plast Surg Clin North Am* 2016;24(03):309-314
- Chang EI, Hanasono MM, Butler CE. Management of unfavorable outcomes in head and neck free flap reconstruction: experience-based lessons from the MD Anderson Cancer Center. *Clin Plast Surg* 2016;43(04):653-667
- Tassone P, Galloway T, Dooley L, Zitsch R III. Orocutaneous fistula after oral cavity resection and reconstruction: systematic review and meta-analysis. *Ann Otol Rhinol Laryngol* 2022;131(08):880-891
- Siddall KZ, Rogers SN, Butterworth CJ. The prosthodontic pathway of the oral cancer patient. *Dent Update* 2012;39(02):98-100, 103-106
- Li W, Wu S, Yuan J, Meng F, Xu C, Li H. Predictors predisposing to orocutaneous fistula occurrence following free flap reconstruction. *Front Oncol* 2022;12:947643
- Al Deek NF, Wei FC, Tsao CK. Fistulae after successful free tissue transfer to head and neck: its prevention and treatment. *Clin Plast Surg* 2016;43(04):739-745
- Khoo MJW, Ooi ASH. Management of postreconstructive head and neck salivary fistulae: a review of current practices. *J Plast Reconstr Aesthet Surg* 2021;74(09):2120-2132