Functional and esthetic rehabilitation of a patient with squamous cell carcinoma of the tongue: Case report

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Rose Mara Ortega
DDs, MSc, PhD
Professor, Department of Dentistry, Federal University of Juiz de Fora, UFJF/GV, Governador Valadares, Minas Gerais, Brazil.
E-mail: rosemara.ortega@ufjf.br

Oscar Fernando Muñoz Chávez
DDs, MSc, PhD
Assistant Professor, Araraquara Dental School, UNESP - University Estadual Paulista, Department of Social Dentistry, Araraquara, São Paulo, Brazil.

Daniel Malta
DDs, MSc, PhD
Assistant Professor, Santa Catarina Dental School, FACVEST University, Department of Restorative Dentistry, Lajes, Santa Catarina, Brazil.

Andreia Bufalino
DDs, MSc, PhD
Assistant Professor, Araraquara Dental School, UNESP - University Estadual Paulista, Department of Diagnosis and Surgery, Araraquara, São Paulo, Brazil.

Cláudia Maria Navarro
DDs, MSc, PhD
Assistant Professor, Araraquara Dental School, UNESP - University Estadual Paulista, Department of Diagnosis and Surgery, Araraquara, São Paulo, Brazil.

Elaine Maria Sgavioli Massucato
DDs, MSc, PhD
Assistant Professor, Araraquara Dental School, UNESP - University Estadual Paulista, Department of Diagnosis and Surgery, Araraquara, São Paulo, Brazil.

ABSTRACT

The present case history reports describes a clinical course from diagnosis to the functional and esthetic rehabilitation of a patient with squamous cell carcinoma of the tongue (SCCT). Radical approaches for SCCT often result in severe deficiencies and reduced quality of life. In this case the treatment included total glossectomy with flap pectoral muscle reconstruction and radiotherapy. An interdisciplinary team worked together to functional rehabilitation of the patient, carried in two phases: preoperative assessment and post-operative reconstruction. The findings from this case showed that functional and esthetic rehabilitation promote social rehabilitation in patients with SCCT treated with radical approaches.

Keywords: Squamous cell carcinoma, Tongue, Glossectomy, Rehabilitation and quality of lif.

1 INTRODUCTION

Squamous cell carcinoma of the tongue (SCCT) is the most common type of malignant tumor of the oral cavity (Keiichi O. & Hitoshi Y., 2019). The treatment of choice is surgery or radiotherapy, or a combination of both (T Singh and M Schenberg, 2013). Advanced lesions require a more radical approach that may involve partial or total glossectomy with or without neck dissection and tongue reconstruction with regional flaps or distant-donor free flaps (Liang Y *et al*., 2015). These radical approaches may result in severe deficiencies and are associated with impairments in speech, mastication, and swallowing and a reduced quality of life (Pankaj K. Et al., 2018). Functional rehabilitation is essential in treating patients with SCCT, especially when functions important for social

life are involved (Romeo U *et al*., 2013). Esthetic rehabilitation is also recognized as an important aspect for these patients and helps in restoring the patients' social life. An important goal of prosthodontics treatment is to improve the quality of life by improving function and esthetics (Fierz J *et al.*, 2013). [7] Prosthodontics treatment involves many steps and requires the expertise of an interdisciplinary team involving a number of different professionals.

This case history report describes the clinical course from diagnosis to functional, esthetic, and social rehabilitation of a patient with SCCT, and highlights the importance of an interdisciplinary team working together to achieve a better quality of life for the patient.

2 CASE HISTORY REPORT

A 53-year-old man was referred with history of a lesion of the tongue that caused pain and difficulty during chewing and swallowing. Physical examination of the oral mucosa revealed an ulceration in the left side of the tongue, extending from the dorsum of the tongue to the floor of the mouth, with 1 month of evolution. The ulceration had a necrotic basis with an elevated and indurated border, and caused severe pain to the patient on touch (**Fig. 1A**). The tongue was indurated and without movement. There was cervical lymph node involvement in the submandibular region. The patient had a 35-year history of cigarette smoking, but his medical history was otherwise unremarkable. The findings were suggestive of SCCT. An incisional biopsy of the lesion was performed and the tissue was submitted for histopathologic examination, which revealed moderately differentiated SCC. The patient subsequently referred to an oncologist and a head and neck surgeon. A definitive diagnosis of SCCT with invasive growth, T3N2bMx was made, and the patient was treated with total glossectomy with flap pectoral muscle reconstruction (**Fig. 1B**), with neck dissection and radiotherapy, which was started 45 days after surgery and lasted for two months.

In the preoperative assessment, a complete head and neck examination was carried out and radiographs were made for overall evaluation, oral prophylaxis, periodontal treatment, and extractions of all the mandibular teeth and almost all the maxillary teeth, except the maxillary right second premolar, maxillary right canine, maxillary right lateral incisor, maxillary right central incisor, maxillary left central incisor and, maxillary left lateral incisor. Preparation and fabrication of restorations were performed. Several oral hygiene protocols were applied and appropriate instructions were provided to the patient to prevent complications of anticancer therapy.

Post-operative reconstruction: Esthetic and functional rehabilitation was performed by direct restoration, which was followed by the construction of a palatal augmentation prosthesis (PAP). For this purpose, a complete denture cast was constructed in irreversible hydrocolloid (**Fig. 2A**), and casting with gypsum cement and teeth waxing were performed subsequently. The objective was to impart a harmonious smile to the patient and obtain a guide cast for reconstruction in composite resin.

The cast was developed in condensation silicone (Zetaplus/ Oranwash, Zermach) and clipped on the incisal part, thereby maintaining the palatal plate, as shown in **Fig. 2A**.

This guide was used after removal of tooth decay, restoration of defects, and tooth preparation. The cavities were cleansed and disinfected with chlorhexidine 2% (FGM), and after washing and drying, were filled with photopolymerizable glass ionomer (Vitrebond, 3M/Espe). They were then primed with 37% phosphoric acid (Ultraetch, Ultradent) for 30 s on the enamel and for 15 s in the dentin, and after washing and drying, were hybridized with a photopolymerizable primer and adhesive (Scothbond MP Plus, 3M/Espe). The guide was then positioned on the cleft of the prepared palatine teeth and served as a basis for reconstruction with nanohybrid composite resins A3D, A3B, and A3E (Z350, 3M/Espe) using a stratified technique. Each increment of composite resin was polymerized for 20 s with a Valo curing light (Ultradent). After completion of the restorations, Sof-lex disks (3M/Espe) were used for finishing. A few days later, felt discs soaked in aluminum oxide-based polishing paste (Cosmedent) were used for polishing, as shown in **Fig. 2B**.

After this step, casting was once again performed to plan and study the insertion axis of the PAP, and the cast was adjusted and acrylic guides were constructed for subsequent intraoral adjustment of the rests, bars, and opposing and retaining clips. New functional molding was carried out to generate a master template, and thus, the metallic structure of the PAP was constructed. After approval of the master template, the PAP was constructed (**Fig. 3A-B**) and installed (**Fig. 4A-B**).

Fig 1. A, ulceration in the left side of the tongue, extending from the dorsum of the tongue to the floor of the mouth. B, total glossectomy with flap pectoral muscle reconstruction.

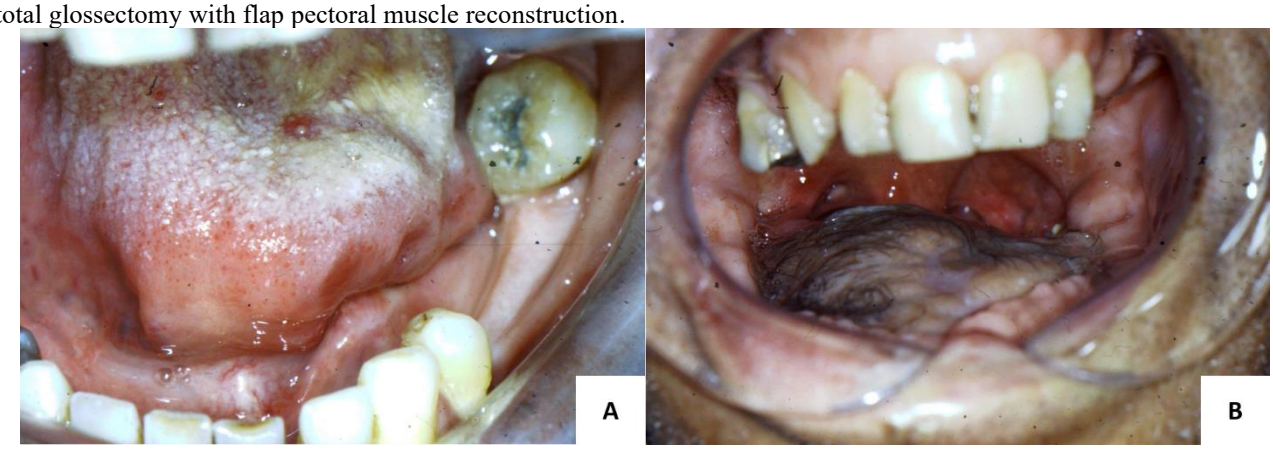


Fig 2. A, Guide cast for reconstruction in composite resin. B, Intraoral findings after complete restorations and polishing.

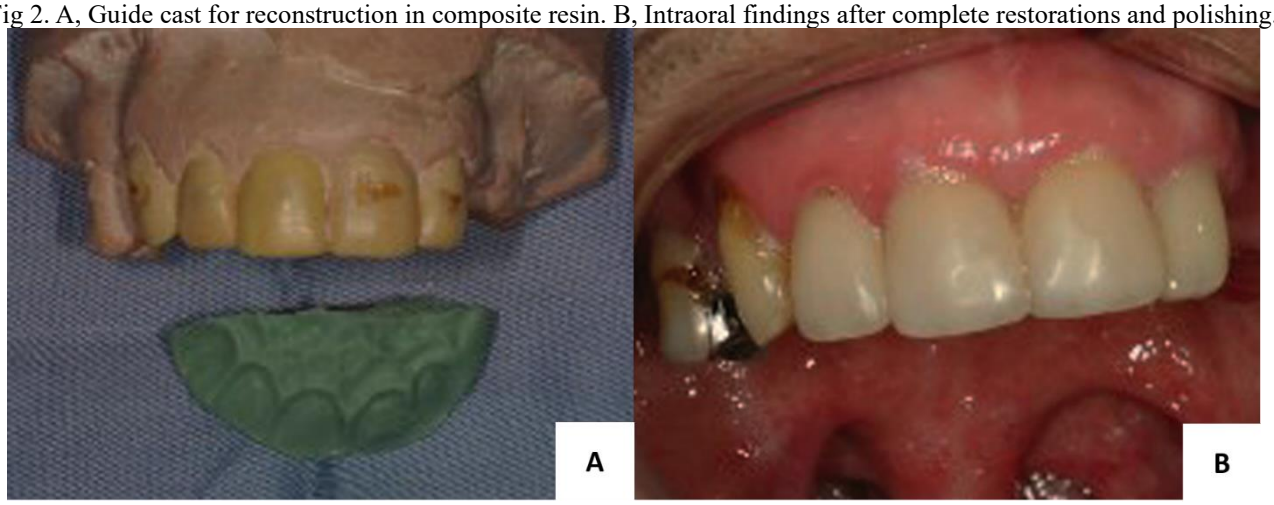


Fig 3. A, Metallic structure view of palatal augmentation prosthesis maintaining palatal plane in resin. B, Frontal view of palatal augmentation prosthesis.

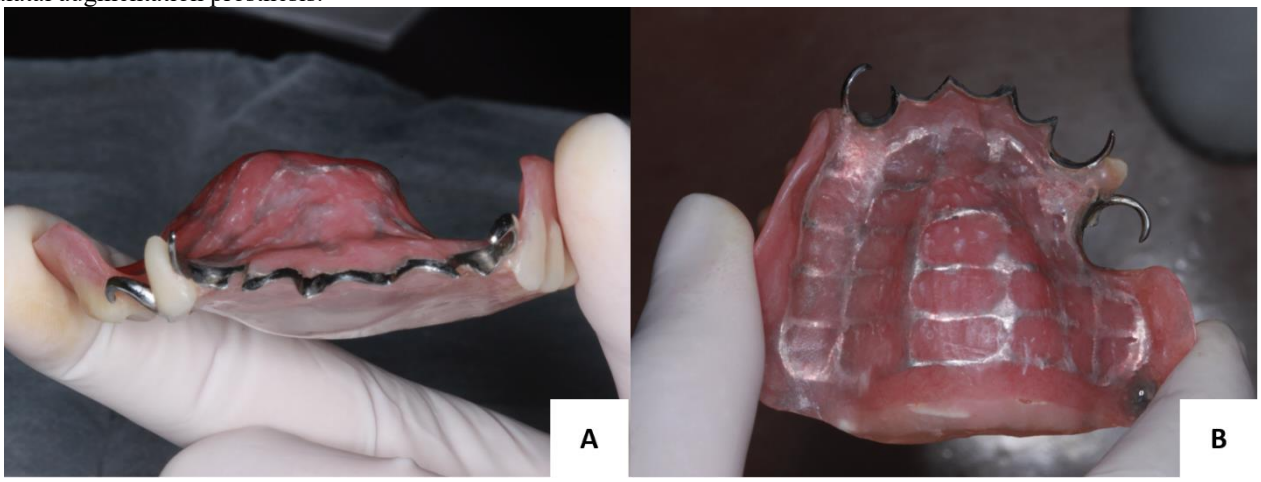
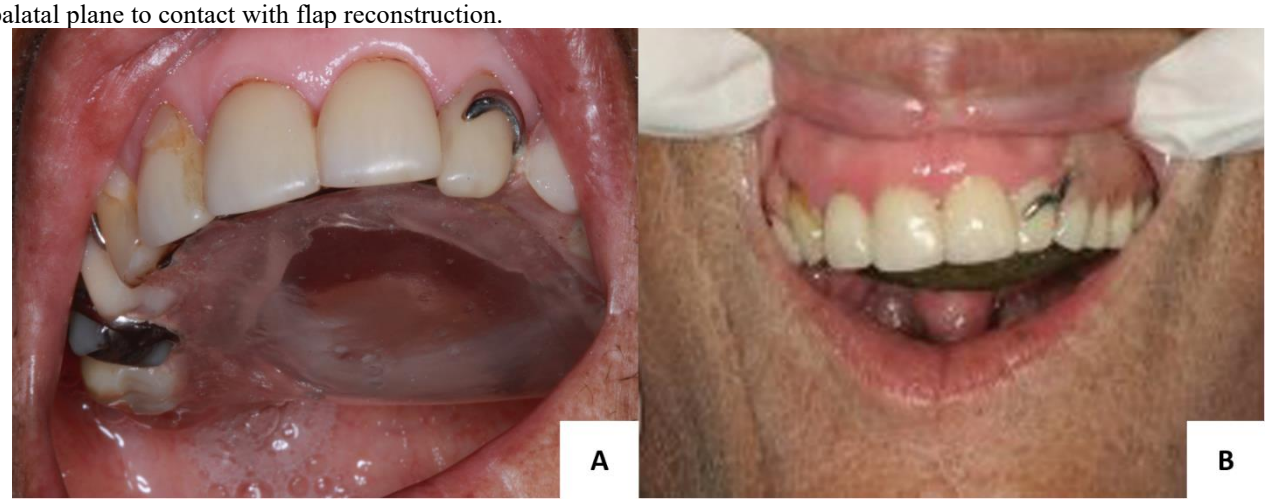


Fig 4. A, Intraoral view of palatal augmentation prosthesis insertion. B, Same palatal augmentation prosthesis promoting palatal plane to contact with flap reconstruction.



3 DISCUSSION

The tongue is a complex and important organ that provides palatal and tooth contact for speech, propels the food bolus towards the oropharynx, and contains receptors that mediate the sense of taste

(Kentaro O *et al*., 2014). Given these clinical functions, SCCT, which needs be treated surgically through glossectomy, would adversely affect the quality of life of the patients by affecting their functionality. After the procedure, the palate/lingual contacts are impaired because of decreased tongue mobility, which results in impairment in speech, chewing, and swallowing (Carvalho V & Sennes LU, 2016). Because glossectomy is an extremely disabling surgical procedure, requiring tooth loss, tissue loss, and/or loss of tissue stability, esthetics is impaired. In addition, all the changes mentioned above result in a social impact (Carvalho V & Sennes LU, 2016).

Patients diagnosed with SCCT often have an oral cavity with missing teeth, open carious lesions, and periodontitis. A diversified approach based on different aspects is necessary, and the patient may often be left with few if any teeth, especially in the jaw affected by the tumor resection, which further complicates functional and esthetic rehabilitation.

In this case history the patient was diagnosed with SCCT with invasive growth, T3N2bMx and treated with total glossectomy and reconstruction with pectoral muscle flaps. The reconstructive techniques ensured patient survival and partial restoration of function, but the flaps were fixed to the floor of the mouth and showed only slight vertical movement, which was not enough for touching the palate like the natural movement of the tongue that assists in swallowing and speech production. In addition, the procedure required extraction of all the mandibular teeth and almost all the maxillary teeth, thereby impairing the patient's function, esthetics, and social life.

A palatal augmentation prosthesis (PAP) is defined as a palatal prosthesis that allows reshaping of the hard palate to improve tongue and palate contact during speech and swallowing and facilitates restoration of function (Payal Rajender Kumar *et al*., 2019; Tomonori Y *et al*., 2022; Bachher GK & Dholam KP, 2010). In addition to restoration of function, the secondary goal of ensuring a satisfactory esthetic outcome was achieved by reconstruction with composite resins using a stratified technique. The interdisciplinary nature of the team, which was composed of a pathologist, stomatologist, periodontist, maxillofacial surgeon, prosthetic specialists, and speech pathologist, played an important role in ensuring a better quality of life for the patient.

The findings from this case suggest that functional and esthetic rehabilitation that promote social rehabilitation are perfectly possible in patients with SCCT treated with radical approaches, althoug the life expectancy of these patients is often short.

4 CONCLUSIONS

This report highlights the importance of functional and esthetic rehabilitation in patients who undergo a radical approach for the treatment of the SCCT. These patients are affected physically and mentally; thus, the functional rehabilitation achieved by PAP and the esthetically acceptable results

obtained by reconstruction with composite resins using a stratified technique could together improve the social life and the overall quality of life of the patient.

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