

Case Report

Prosthodontic rehabilitation of completely edentulous patient with partial glossectomy

Aditi Garg

Department of Prosthodontics, Inderprastha Dental College, Sahibabad, Uttar Pradesh, India

Abstract

Oral cancer accounts for about 40% of all cancers inflicting the human beings. Those involving the tongue results in mild to severe deficiencies of phonation, deglutition, mastication, and taste depending upon the degree and extent tissues involved. Often rehabilitation of such patient is a challenge for the prosthodontist and involves a careful observation and evaluation of the residual oral function and ways to restore them. This article presents a case report of prosthodontic rehabilitation completely edentulous patient, who underwent partial glossectomy following surgical resection of the squamous cell carcinoma involving left lateral borders of the tongue. An attempt was made to restore the comfort and function of the patient with the help of palatal augmentation prosthesis, with additional assistance through speech therapy and simple oral exercises.

Key Words: Oral exercises, palatal augmentation prosthesis, partial glossectomy, speech therapy

Address for correspondence:

Dr. Aditi Garg, 893/1, Rajendra Nagar, Railway Road, Hapur - 245 101, Uttar Pradesh, India. E-mail: gaditi82@gmail.com

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INTRODUCTION

Malignant lesions involving tongue account for 18% of all the oral cancer cases with the highest prevalence along the posterior two-thirds and lateral borders of the tongue. The form and extent of remaining oral tissues, following surgical resection can significantly influence the success rate of prosthetic rehabilitation.^[1]

Complete or partial glossectomy results in morbidity related to speech and deglutition, due to altered residual tongue volume and mobility.^[2,3]

The treatment options may include:

- Modified dental prosthesis

- Speech therapy^[4,5]
- Oral exercises.^[6]

This article describes the total prosthetic rehabilitation of the completely edentulous patient with partial glossectomy along the left lateral border of the tongue, following surgical resection of the squamous cell carcinoma involving the tongue.

CASE REPORT

Clinical report

A 65-year-old male patient reported with the chief complaint of difficulty in chewing due to missing teeth in upper and lower arches and impaired speech due to partial resection of

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the tongue along the left lateral border following the surgery. The patient had been diagnosed with squamous cell carcinoma involving the left lateral border of the tongue 2 years back.

The patient had type II diabetes since last 20 years and was under medication. General examination indicated there was collapse of lip and cheek on the left side of the face, due to lack of support of the musculature.

Intraorally, completely edentulous well-formed maxillary and severely resorbed mandibular residual alveolar ridges were intact [Figure 1]. The lingual sulcus was almost completely lost on the resected side. The floor of the mouth was also compromised with musculature partially covering the mandibular residual alveolar ridge on the left posterior region.

The tongue was compromised with resected left lateral border, flaccid, with altered posture, and restricted movements. The patient had a complaint of excessive pooling and drooling of saliva from the left corner of the mouth.

The patient wore an old denture, fabricated 1.5 years back. The tissue surface of the denture showed signs of frequent chair side relining and use of denture adhesive. The prosthesis lacked the required stability, retention, and esthetics. There was a loss in the vertical dimension, accentuated by collapsed bite [Figure 2].

The treatment plan included maxillary and mandibular complete dentures, using a special impression technique for mandibular arch and modified occlusal scheme.

The patient was instructed to discontinue the use of old dentures and report back after 3 days. A modified impression technique was used for the mandibular arch. The mandibular metal stock tray was beaded using impression compound and was extended properly for recording the residual alveolar ridge and associated tissues, and then tray was loaded with an admix of impression compound and tracing compound in ratio of 3:7 [Figure 2]. The casts were poured with type III dental stone (Kaldent, Kalabhai). Custom tray was fabricated using self-cure resin. Peripheral tracing was done, and the

secondary impression was made using zinc oxide eugenol impression paste.

The master cast was poured with type IV die stone. Jaw relation was recorded, decreasing the vertical dimension of occlusion slightly by reducing the height of the occlusal plane on the mandibular denture, to allow the residual tongue to more conveniently place the food bolus on the occlusal table.^[7] Posterior teeth with reduced buccolingual width and reduced cuspal angle (semi-anatomic) were selected. These would aid in providing the stability to the mandibular denture as well as reduce the stress transmitted on to the underlying ridge, hence slow down the further resorption of the bone. The teeth arrangement was done with the anterior teeth arranged closed to prevent the escape of air between them and posterior in lingualized occlusion. Try-in was done to verify the retention, stability, and esthetics of the prosthesis, the denture was cured, finished, and polished [Figure 3].

Palatal augmentation of maxillary denture

The maxillary denture was modified after acrylicization by palatal augmentation. Functional palatal impression technique was followed, whereby modeling compound was softened and added to the palatal aspect of the denture on the left side. The patient was instructed to functionally manipulate the modeling compound with the tongue by repeating the lingual alveolar sounds /k/and/g/for the posterior palatal tracing, and the lingual alveolar sounds/t/and/d/for the anterior palatal tracing.^[8] This enabled the tongue to make palatal articulations. Additional compound was added to the anterior palatal region, allowing the mandibular anterior teeth to indent into the compound. This resulted in a significant improvement for the fricative and affricative (hard) palatal lingual sounds /s/,/sh/,/z/,/zh/ [Figure 4]. For tracing the swallowing patterns, patient was asked to swallow blenderized, soft diet. A proper balance was made between speech and swallowing tracings, making sure that none of them is restricted.^[9] The patient was able to communicate and swallow effectively. The entire traced area is processed with heat cure acrylic resin [Figure 4].



Figure 1: Maxillary arch with well-developed residual alveolar ridge and mandibular arch with severely resorbed residual alveolar ridge



Figure 2: Old denture with loss of retention, stability and support along with the collapsed bite and diagnostic impressions of maxillary and mandibular arch



Figure 3: Lateral view of complete denture in centric relation position and front view of complete denture showing the anterior teeth placed close to each other to aid in phonation

The denture was delivered to the patient and follow-up was done after 24 h and 1 week. After 3 weeks, speech therapy and oral exercises were initiated to improve the efficiency of the prosthesis.

Speech therapy

The average speech session lasted for 30 min, following which patient was asked to repeat the exercises 3 times daily.^[10,11]

- In producing alveolar plosives/t/,/d/, which requires tongue articulation, modified gesture similar to the production of labial plosives/b/,/p/with the lips coming to each other
- In producing the alveolar fricatives/s/,/z/, the speakers blew the air through closed teeth instead
- In producing stop consonants, different degree of labial protrusion and retraction was followed.

Oral exercises

The patient was instructed that all exercises are five repetitions daily, 5 times a day.^[12,13]

- Open the mouth as wide as possible for stimulation of tongue base
- With a tongue depressor; push nonaffected side of tongue against depressor for the count of three and relax
- With the help of tongue, attempt to lick alveolar ridge, left to right, then right to left
- With the help of tongue, attempt to lick lip, left to right, then right to left
- With the help of tongue, attempt to push nonaffected cheek out and hold for the count of three
- With teeth together and lips closed, attempt to push tongue forward and hold for count of three
- For prevention of saliva pooling and drooling, pucker lips and do a strong suck-back and swallow.

The patient regularly underwent the speech therapy and oral exercises. After insertion of a denture, follow-up was done after 24 h, 1 week, 1 month, and periodically after every 6 months. The patient expressed satisfaction and gratitude for the rehabilitation efforts.



Figure 4: Palatal augmentation prosthesis using functional palatal impression technique using impression compound and acrylized maxillary denture with palatal augmentation prosthesis

DISCUSSION

The complete rehabilitation of glossectomy patient, aims at reduction in the size of the oral cavity thereby improving the resonance, developing altered articulating surface as well as the pattern which would diminish the deficiencies related to speech and deglutition.^[14]

Palatal augmentation prosthesis is bulky and often difficult to adjust. It brings a significant and immediate improvement in the intelligibility and quality of the sound by the alteration in the size of the oral cavity with the prosthesis.^[7,8]

Georgian, Logemann, and Fisher suggested that speech therapy helps the patients develop compensatory strategies to produce speech sounds in an altered way.^[15] Strategies for improving communicative efficiency such as maintaining good eye contact with listeners and speaking at a slower rate, and bring a positive change in the prognosis of the prosthesis.

Greven, Meijer, and Tiwari suggested that apart from developing new places of articulation, other aspects of speech, such as the intonation, rhythm, and speech rate, need to be modified for the betterment of the patient.

CONCLUSION

Careful observation and evaluation of residual oral functions played a key role in the prosthetic rehabilitation of this patient with partial glossectomy. Factors such as the extent of the surgical resection (Rentschler and Mann, 1980; Pauloski *et al.*, 1998), type of reconstruction (Konstantinovic and Dimic, 1998), the mobility of the residual oral and paraoral tissues (Korpijaakko-Huuhka, Soderholm, and Lehtihalmes, 1999), neuromuscular coordination, mental proficiency, and motivation dictate the degree to which the patient's impaired oral functions may be rehabilitated and were kept in mind while rehabilitating this patient.

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Conflicts of interest

There are no conflicts of interest.

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