



## CASE REPORT

### PROSTHODONTIC REHABILITATION OF PARTIAL GLOSSECTOMY WITH SPEECH THERAPY: A CASE REPORT

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#### ABSTRACT

Oral carcinomas accounts for about 40% of all carcinomas prevalent amongst 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. Rehabilitation of such patients pose a challenge for the clinician and involves a careful observation and evaluation of the residual oral function. 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, speech and function of the patient with additional assistance through speech therapy and simple oral exercises.

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## INTRODUCTION

Malignant lesions involving tongue have shown to have a higher prevalence along the posterior two-thirds and lateral borders of the tongue. The success rate of prosthetic rehabilitation depends mainly on the form and extent of remaining oral tissues, following surgical resection. Hence proper diagnosis and treatment plan is important to conserve the oral structures (Marunick, 2004). Complete or partial glossectomy results in morbidity related to speech and deglutition, due to altered residual tongue volume and mobility (Bressmann, 2009). Speech disorders include impaired articulation, reduced speech intelligibility and precision, altered oral and nasal resonance impaired voice quality, and reduction in global speech proficiency (Bachher, 2002). Radiation therapy further adds to these complications in form of xerostomia, acute mucositis, fibrosis, and trismus. The treatment options include modified dental prosthesis, speech therapy (Lauciello, 1980 and Furia, 2001), oral exercises (Logemann, 1997). This case report describes the 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.

## Clinical Report

A 60 year old female 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 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 1 years back. She underwent partial glossectomy with radical brachytherapy for the same. General examination indicated no gross asymmetry, normal mouth opening and absence of any mandibular deviation. Intraorally, completely edentulous maxillary and mandibular residual alveolar ridges were intact and were not included in the surgical resection (Fig. 1). The overlying mucosa was firm and resilient. 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

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restricted movements (Fig. 2). A complain of dry mouth was also reported. The treatment plan included maxillary and mandibular complete dentures, with monoplane occlusal scheme.



**Fig. 1. Well developed Maxillary arch residual alveolar ridge and partially resorbed mandibular residual alveolar ridge**



**Fig. 2. Partially resected tongue on left lateral border**

The maxillary and mandibular primary impressions were made with impression compound (Pinnacle, DPI) in a stock metal tray using the conventional technique (Fig. 3). To avoid the burning sensation of zinc oxide eugenol impression material due to xerostomia, polyether (Impregum, 3M ESPE) was used as the material for final impression (Fig. 4).



**Fig. 3. Primary impressions of maxillary and mandibular arch**



**Fig. 4. Final Impression using polyether impression material**

The master cast was poured with type III dental stone. Jaw relation was recorded, decreasing the vertical dimension of occlusion slightly by reducing the height of the occlusal plane on the mandibular denture. Posterior teeth with reduced buccolingual width and cusplless teeth were selected.



**Fig. 5. Lateral view of complete denture in centric relation position showing the anterior teeth placed close to each other to aid in phonation**



**Fig. 6. Final mandibular prosthesis showing asymmetrical lingual borders**

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 and aid in comfort to the thin mucosa. The teeth arrangement was done with the anterior teeth arranged closed to prevent the escape of air between them and posterior in monoplane occlusion. Try-in was done to verify the retention, stability and esthetics of the prosthesis. The final prosthesis was fabricated using heat activated polymethyl methacrylate (Heat Cure, DPI). After the denture was cured, it was finished and polished (Fig. 5). The lingual border on the affected side was asymmetrical due to loss of vestibular depth (Fig. 6). Following insertion the patient regularly underwent the speech therapy and oral exercises. After insertion of denture, follow up was done after 24 hours, 1 week, 1 month and periodically after every 6 months. The patient expressed satisfaction and gratitude for the rehabilitation efforts.

#### **Speech Therapy (Bachher, 2001 and Savariaux, 2001)**

The average speech session lasted for 30 minutes, following which patient was asked to repeat the exercises 3 times daily. 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 (Sullivan, 2001 and Lazarus, 2003)

Patient was instructed that all exercises are five repetitions daily, five times a day.

- Opening her mouth as wide as possible for stimulation of tongue base.
- Next was pushing the non-affected side of tongue against a tongue depressor for count of three and was relaxed.
- Attempt to lick the alveolar ridge with her tongue, left to right, then right to left.
- Attempt to lick her lip, left to right, then right to left.
- Attempt to push non-affected cheek out with her tongue and hold for the count of three.
- With her teeth together and lips closed, attempt to push tongue forward and hold for count of three.

### 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 (Aramany, 1987). The vertical height was decreased because slight reduction on the mandibular denture allow the residual tongue to more conveniently place the food bolus on the occlusal table (Bhirangi, 2012). Posterior teeth with reduced buccolingual width and reduced cusp were arranged to provide monoplane occlusion. This offered better stability and comfort. Georgian, Logemann and Fisher suggested that speech therapy helps the patients develop compensatory strategies to produce speech sounds in an altered way (Georgian, 1982). Strategies for improving communicative efficiency, such as maintaining good eye contact with listeners and speaking at a slower rate, bring a positive change in the prognosis of the prosthesis. 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

Meticulous observation and evaluation of residual oral functions play a key role in the prosthetic rehabilitation of partial glossectomy patients. Patients often present with diverse complaints and deficiencies related to speech and swallowing. Factors such as the extent of the surgical resection, type of reconstruction, the mobility of the residual oral and paraoral tissues, 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.

A well planned effort could provide appropriate and successful rehabilitation, thereby restoring the comfort and function of the patient.

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