

## Clinical Report

# Rehabilitation of a patient with partial glossectomy

Dilip Dhamankar, Janani Mahadevan, Arun Gupta

Department of Prosthodontics, Dr. DY Patil Dental College, Pimpri, Pune, India

### For correspondence

Dr. Janani Mahadevan, Department of Prosthodontics, Dr. DY Patil Dental College, Pimpri, Pune, India. E-mail: drjananim@yahoo.co.in

One of the most challenging complications in maxillofacial prosthetics is the rehabilitation of the patient who has lost all or a part of the tongue. Such patients have difficulties with deglutition, mastication, speech and saliva control. Dysfunction in swallowing is also a problem, and it often contributes to nutritional deficiency.

**Key words:** Deglutition, palatal augmentation, speech

## INTRODUCTION

Oral cancer is one of the most common finding in India, habits and cultural compunctions such as paan, tobacco in various forms, viz, smoking, chewing being its chief causes. Oral cancer is often treated surgically in combination with radiotherapy or chemotherapy. One of the most challenging problems in maxillofacial prosthetics is the rehabilitation of a patient who has lost all or a part of the tongue. Such patients face difficulties with deglutition, mastication, speech and saliva control.<sup>[1]</sup> Dysfunction in swallowing is also a problem, and it often contributes to nutritional deficiency. Adherence of food to the palate is a problem in most glossectomy patients. Because of reduced elevation of the tongue, patients are unable to clean the solid materials from the palatal vault. The coordinated muscle reflex for swallowing is disturbed in all patients with partial glossectomy.<sup>[2]</sup> Speech in humans is produced by a controlled stream of air that passes through a vibrating mechanism, a resonating system and a partially or totally occluded oral cavity. A thorough knowledge of normal speech articulation is necessary before considering the compensatory articulation used by glossectomy patients.<sup>[1]</sup>

## PHONETIC CONSIDERATION IN GLOSSECTOMY PATIENTS

The degree of articulation impairment in glossectomy patients is dependent on the extent of tissue loss.<sup>[1]</sup> Partial glossectomy often results in improper tongue-palate valving during speech because the patient's tongue cannot reach the palate to form certain sounds. The tongue is the primary articulator of speech sounds. It shapes the oral and pharyngeal cavities for vowel sounds and restricts airflow through the oral cavity for consonant sounds. Consonant sounds are

produced due to the contact of the tongue with the teeth (linguodental), the alveolar ridge (lingualveolar), the hard palate (linguopalatal) and the soft palate (linguovelar). Phonetics can be used as a diagnostic tool in determining the restricted and nonrestricted regions of the palate. The tongue contacts the anterior palate in the formation of the sounds /l/ and /t/; the middle palate, in /d/, /j/ and /g/ and the posterior palate, in /k/ and /c/.

Skelly *et al* have suggested that total glossectomy patients develop truly compensatory patterns of speech, whereas partial glossectomy patients require prosthodontic treatment and speech therapy to develop compensatory articulation.<sup>[2]</sup>

The following is a case report of a patient with partial glossectomy who was treated with palatal augmentation prosthesis.

## CLINICAL EVALUATION

A 51-year-old man (name, Mr. Pardesi) working as a policeman reported to the clinic with a history of carcinoma of the tongue and its subsequent treatment with partial glossectomy and radiotherapy. On clinical examination, it was observed that the surgery consisted of the resection of the anterior two-thirds of the tongue [Figure 1]. The posterior portion was intact. The maxillary and the mandibular alveolar ridges with the entire dentition were intact. Mouth opening was slightly restricted due to postoperative radiotherapy. The patient complained of pooling of saliva in the anterior part of the mouth and speech impairment. He had to extend the head back and try to swallow liquids so he was on Ryle Tukcs feeding.

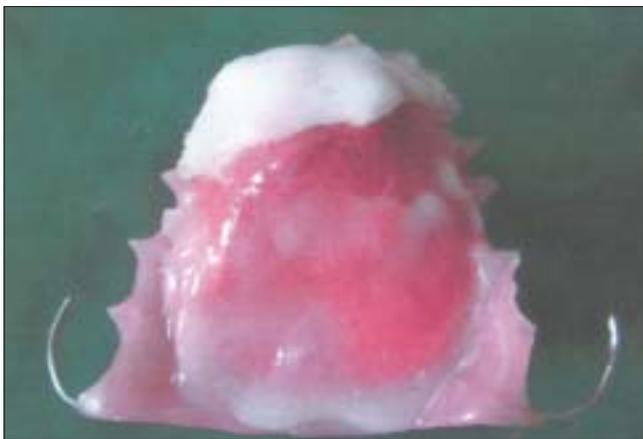
The patient's tongue could contact the posterior part of the palate but not the anterior and middle portions of the palate. It was then decided to treat the patient using palatal augmentation prosthesis.



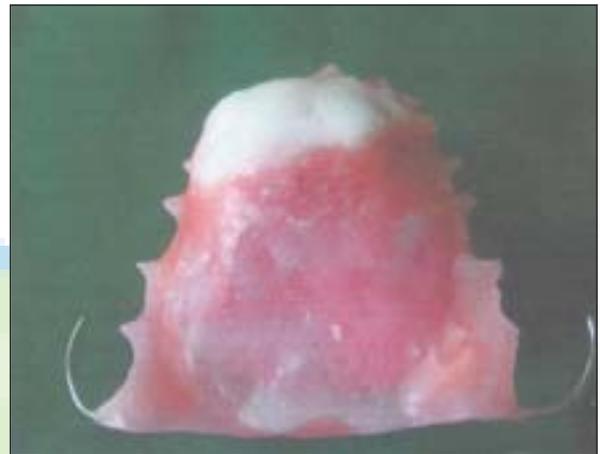
**Figure 1:** Patient with partial resection of tongue



**Figure 4:** Irregularities present on the impression are blocked with wax



**Figure 2:** Impression compound used on an acrylic plate to record the movements of tongue



**Figure 5:** Palatal augmentation prosthesis fabricated in a clear acrylic placed in the mouth



**Figure 3:** Tissue conditioner used on the impression compound to record the fine details of tongue movements



**Figure 6:** Patient can comfortably swallow with the prosthesis

### **PALATAL AUGMENTATION PROSTHESIS**

Maxillary partial denture framework was fabricated, with wrought wire clasps on I 8 and 28 to avoid interference with the occlusion. The patient was trained

for the insertion and removal of the palatal plate. The palatal plate was then loaded with an impression compound and inserted in the patient's mouth to record the functional movements of the tongue [Figure 2].

The patient was asked to repeat linguoalveolar sounds /t/ and /d/ for anterior palatal tracing as well as perform swallowing action to record the contact of the tongue and palate.

The patient was asked whether the contact of the tongue with the palate occurred and whether he was comfortable while swallowing. Once he was comfortable with the vertical positioning of the palate, some more impression compound was inserted in a horizontal manner to increase the area of contact of the tongue with the palate. The patient was then asked to repeat the movements. After the patient was completely comfortable with the compound tracing, the final tracing was performed using a soft liner. The soft liner was mixed according to the manufacturer's instructions and loaded over the impression compound tracing; the patient was then asked to repeat the movements as above [Figure 3].

The tissue conditioner spread over the distal part of the palate was removed, and the irregularities over the impression were filled with wax to ensure that no food was lodged in the fabricated prosthesis [Figure 4].

#### LABORATORY PROCEDURE

The entire prosthesis was fabricated with heat-cured clear acrylic similar to the fabrication of a hollow bulb obturator. After flasking and dewaxing, the cavity in the counter of the flask was layered with a single sheet of modeling wax and stops were prepared. A shell of cold-cure acrylic was prepared over the wax. The rest of the procedure was similar to packing of hollow bulb obturator except for the absence of a lid in this case. The stops prepared earlier helped in reorienting the shell at the time of the final closure of flask. The final prosthesis was finished and polished as done normally. The hollow palate reduced the weight of the appliance and was more comfortable to the patient. It was then inserted in the patient's mouth, and any high point observed with the articulating paper was trimmed till the maximum intercuspation of the teeth was achieved [Figure 5].

The thickness of the midpalate was 2 mm for the partial denture framework; after fabrication of the prosthesis, the thickness was 22 mm. Initially, the patient had difficulty in inserting and removing the

appliance due to a reduced mouth opening caused by radiotherapy. After radiotherapy, muscle exercise was administered to the patient to relieve the trismus. Thereafter, the patient was completely comfortable with the prosthesis. The patient did need a speech therapist to increase the clarity of speech [Figure 6].

Such prosthesis can be provided to edentulous patients also by incorporating a false palate in the maxillary denture.

#### CONCLUSION

Surgery for carcinoma of the tongue and floor of the mouth results in the alteration of the muscles of the tongue and floor of the mouth. Both primary and secondary surgical procedures often result in scar formation with reduced mobility of the tongue during speech and deglutition.<sup>[3]</sup> The prosthodontic management of patients with partial tongue resection often includes lowering the palatal vault, while the management of total glossectomy usually requires a mandibular tongue prosthesis.<sup>[4]</sup>

Speech therapy can be used to help determine the proper placement of the portion of the prosthesis involved in speech. The prosthetic rehabilitation approach described in this study lowers the palatal vault with a false palate to enable the tongue to function against it during speech and swallowing.

#### REFERENCES

1. McKinstry RE, Aramany MA, Berry QC, Sansone I. Speech considerations in prosthodontic rehabilitation of the glossectomy patients. *J Prosthet Dent* 1985;53: 384-7.
2. Knowles JC, Chalian VA, Shanks JC. A functional speech impression used to fabricate a maxillary speech prosthesis of a partial glossectomy patients. *J Prosthet Dent* 1984;51:232-7.
3. Aramany MA, Downs JA, Berry QC, Aslan Y. Prosthetic rehabilitation for glossectomy patients. *J Prosthet Dent* 1982;48:78-81.
4. Cotert HS, Aras E. Mastication, deglutition and speech considerations in prosthodontic rehabilitation of a total glossectomy patients. *J Oral Rehabil* 1999;26:75-9.

Source of Support: Nil, Conflict of Interest: None declared.