

## Review article:

# Rehabilitation of glossectomy patient: Review

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### Abstract

In the entire realm of human physiology, no muscular mechanism is more complicated or has more varied functions, unusual mobility and importance in social contacts than the tongue. For the patients with extensive cancerous involvement of tongue, inspite of the adverse treatment sequelae, glossectomy may offer the only treatment of choice. All the functions associated with the interaction of the tongue are usually severely impaired. Prosthodontists can be of invaluable importance in management of such patients. The placement of tongue prosthesis to obturate the large defect created by glossectomy can speed the recovery of patients and return them to society to enjoy a nearly normal diet and produce intelligible speech.

**Key words:** glossectomy, tongue prosthesis, palatal augmentation prosthesis

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### Introduction

The tongue is a mobile muscular organ of deglutition; taste and speech which bulges upward from the floor of the mouth; and its posterior part forms the anterior wall of the oral part of the pharynx. Oncologic management of advanced carcinoma of the tongue is a difficult medical problem that can create serious treatment dilemmas.<sup>1</sup> For the patients with extensive cancerous involvement of the tongue, glossectomy (partial or complete) may offer the only hope of cure.<sup>2</sup>

In patients with total or partial glossectomy, articulation, resonance and swallowing is affected. Further deterioration of oral function occurs if the mandible is resected. The rehabilitation depends on the extent of surgery.

Before treatment, the clinician should evaluate the mobility and sensory status of remaining structures. These findings should be correlated with swallowing studies, patient expectations, and motivation to determine realistic treatment goals.<sup>3</sup>

### Procedure:

Resections may include the floor of the mouth and bone of the mandible in addition to the glossectomy (partial or complete). The various clinical scenarios include:

1. Completely edentulous with total glossectomy.

Treatment: Mandibular denture extending over the floor of the mouth with a mushroom shaped button attached to it on which silicon tongue can be placed (fig 1).

After a total glossectomy the floor of the mouth becomes concave. Impressions are made with irreversible hydrocolloid material using a maxillary tray for mandibular arch to record the floor of the mouth. The mandibular base extends over the floor of the mouth. A "mushroomlike" button is made on the mandibular prosthesis so that a silicone tongue can be placed over it.

Two prosthetic tongues can be made, one for speech (fig 2) and one for swallowing (fig 3). The tongue made for speech is somewhat flat, with a slightly wide anterior elevation to aid in articulation of linguoalveolar sounds `t` and `d` and

to aid in shaping the oral cavity for improved vowel production . The tongue for swallowing is made with a trough in the posterior aspect to guide the food bolus into the oropharynx.<sup>1</sup>

1. Completely edentulous with total glossectomy and hemimandibulectomy.

Treatment 1: Mandible is reconstructed with bone graft and implants are placed. After that implant retained overdenture is made with tongue prosthesis.

Treatment 2: Mandibular complete denture obturating the defect and maxillary complete denture with a guiding flange (fig 4).

Loss of continuity of the mandible affects the balance of the lower face and leads to deviation of the residual segment toward the resected side.

In general, patients suffering extensive soft tissue loss resulting from tight wound closure, radiation therapy, and those requiring a classical radical neck dissection exhibit the most severe mandibular deviation and dysfunction.<sup>8</sup> Also the esthetics is affected due to tissue contraction. Therefore to limit the deviation of mandible towards the resected side, a guiding flange is made. This is a treatment of choice in patients who are either not medically sound or cannot afford the expensive and extensive grafting procedures.

2. Partially edentulous with partial glossectomy involving anterior part of tongue.

Treatment: Maxillary cast partial denture with palatal augmentation (fig 5).

The palatal augmentation prosthesis (PAP) has been defined by the Glossary of Prosthodontic

Terms as a palatal prosthesis that allows reshaping of the hard palate to improve tongue/palate contact during speech and swallowing because of impaired tongue mobility as a result of surgery, trauma, or neurologic/motor deficits.<sup>9</sup> The palatal augmentation prosthesis is used to restore impaired speech and swallowing in glossectomy patients by artificially lowering the palatal vault to provide contact between the remaining tongue and the palatal contours.<sup>6</sup>

The function of the residual tongue is recorded with softened modeling compound. The patient is asked to repeat the linguovelar sounds and the linguoalveolar. The compound gets moulded accordingly and then the denture is processed.

Modification

If acceptable speech articulation is attained for most elements of speech except the linguoalveolar fricatives `s` and `t`, another modification can be done. A narrow, sharp groove carved in the midline of the palatal prosthesis can, by directing the air stream, improve the production of these sounds.<sup>1</sup>

1.Condition: Edentulous patient with segmental resection of mandible and resection of lateral part of tongue.

Treatment: Mandibular cast partial denture obturating the defect with a guiding flange and maxillary cast partial denture with palatal augmentation (fig 6).

The guidance flange for the mandibular framework was designed to extend on the nondefect side.<sup>7</sup>



Fig 1



Fig 2



Fig 3



Fig 4



Fig 5



Fig 6

**Legends:**

1. Mandibular denture covering the floor of the mouth with mushroom shaped button.
2. Tongue for speech.
3. Tongue for swallowing.
4. Maxillary denture with guiding flange.
5. Maxillary cast partial denture with palatal augmentation prosthesis.
6. Mandibular cast partial denture with guiding flange.

### Discussion

Swallowing and speaking by prosthodontic management of glossectomy patient is a difficult undertaking for both the prosthodontist and the patient. Particular considerations should be given to the patient's chief complaints when planning treatment for the glossectomy patient. A patient may be able to accommodate to some dysfunction without prosthetic support, while desiring prosthetic treatment helps to improve or correct other specific problems.<sup>4</sup> A wide buccolingual table, an occlusal table height matched to that of the tongue body, and a closely adhering tongue and lingual flange are effective means of preventing the food from dropping to the oral floor, keeping the food on the occlusal table, and crushing the food. When constructed in a systematic manner with the assistance of a speech pathologist, the mandibular tongue prosthesis can achieve the following<sup>5</sup>:

(1) reduction in the size of the oral cavity, thereby improving resonance characteristics,

(2) direction of food into the esophagus with the aid of a trough carved into the prosthetic tongue,  
(3) protection of the underlying fragile tissue,  
(4) development of a surface for the residual tongue tissue to contact during speech and swallowing,  
(5) improvement in appearance and psychosocial adjustment.<sup>2</sup>

### Conclusion

Patient who has undergone total or partial glossectomy, rehabilitation of speech is the most important factor in re-establishing interpersonal communication. Rehabilitation of swallowing also plays an important role in socialization.<sup>10</sup> Speech therapy if undertaken proves a great help to these patients.

The prosthetic tongue may not replace entirely the functions of tongue but it does provide glossectomy patient with a certain degree of comfort and function.

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