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REHABILITATION OF A TOTAL GLOSSECTOMY PATIENT USING PALATAL TONGUE PROSTHESIS - A CASE REPORT

Prosthodontics

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ABSTRACT

Tongue is one of the most important organs for chewing, swallowing, and speaking. Advanced tongue cancer is a complex medical condition with challenging oncologic management that can lead to serious treatment options. In certain cases, the best course of action may involve a glossectomy and all of its associated complications. Following the procedure, most of the glossectomy patients appear to be reluctant to speak or take oral fluids. The patient may also experience psychological impairment as a result. A silicone tongue prosthesis can help patients who have had a total glossectomy by improving their swallowing and speech. Speech and swallowing are improved by palatal augmentation, which reshapes the hard palate to improve tongue to hard palate contact and effectively enhances the patient's ability to speak and swallow, improving their quality of life. This case report discusses detailing the prosthodontic rehabilitation of a total glossectomy dentulous patient with acrylic tongue prosthesis.

KEYWORDS

INTRODUCTION

The tongue facilitates speech, deglutition, and mastication in the oral cavity. In tongue cancers, the primary surgical resection is the standard of care of treatment. After a glossectomy, patients may experience facial disfigurement and difficulties with speech, mastication, deglutition and saliva control.[1] Following surgery, these patients may benefit from modifying their Palatal Augmentation Prosthesis (PAP) in addition to speech therapy and oral exercises for their rehabilitation. The palatal augmentation prosthesis, as defined by GPT 10, is a removable maxillofacial prosthesis that modifies the topographical form of the hard and/or soft palate next to the tongue. It enables the hard palate to be reshaped to improve tongue-palate contact during speech and swallowing, making up for tongue mobility impairments caused by trauma, surgery, or neurologic/motor deficits.

Case Presentation

A 49 year old female patient reported to the Department of Prosthodontics with the chief complaint of difficulty swallowing and mastication and speech impairment. Up on acquiring her medical history, the patient disclosed that she had undergone a complete glossectomy as a result of being diagnosed with squamous cell carcinoma of the right lateral border of the tongue. The patient underwent post-operative radiation therapy and had reported to the department after 1 year of completion of the radiation therapy.

Fig 1 Extraoral picture:
a) Frontal View
b) Lateral View

Intraoral examination revealed that patient was dentulous with few teeth missing and had adequate mouth opening (50 mm). Also the lingual sulcus was completely obliterated in the posterior mandibular region.

Fig 2: Intraoral picture:
a) Maxillary occlusal view
b) Mandibular occlusal View
c) Total glossectomy

The floor of the mouth was positioned differently and there were limitations on movement. Palatally augmented prosthesis was planned since the patient could execute specific functional movements. When there is residual function in the remaining oral floor, palatally augmented prostheses are taken into consideration. Consequently, the functional palatal impression technique was used to contour the oral surface of PAP as part of the treatment plan. This technique involved applying functional wax to the oral surface and reproducing that shape in the final prosthesis.

Using stock tray, primary impressions were made in addition silicone material and primary casts were made. A self-cure hollow prosthesis was fabricated to serve as a foundation on which melted wax was applied to create functional records. Wrap around clasp was designed. Before any records were created, the prosthesis was examined for comfort and retention.

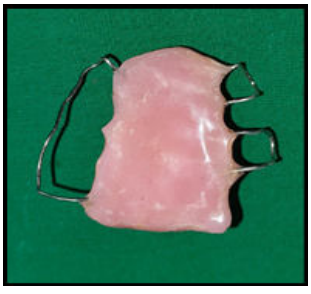


Fig 3: Self cure hollow prosthesis as foundation base

The clarity of speech during particular sounds was taken into consideration when evaluating the tongue-palate contacts. The linguovelar sounds /k/, /kh/, /g/, and /gh/ were repeated by the patient

in order to teach them how to functionally manipulate the wax by the floor of the mouth for the posterior palatal tracing.

Using a brush, the wax was applied to the hollow prosthesis' oral side. Linguoalveolar sounds /t/ and /d/ were employed in the anterior palatal tracing. The tongue was able to communicate with the various palate positions due to this sounds.

When more wax was applied to the anterior palatal region, the hard and fricative linguopalatal sounds /s/, /sh/, /z/, /zh/, /ch/, and /jh/ improved significantly.

To trace their swallowing patterns, the patient was asked to swallow saliva multiple times. After a second phonetic check, the speech and swallowing tracings were finally balanced properly. Verification is necessary to ensure that both functions are carried out without any limitations. Heat-cure acrylic resin was used to complete the prosthesis' processing.

Fig 4: Lost salt technique of acrylization for hollow prosthesis

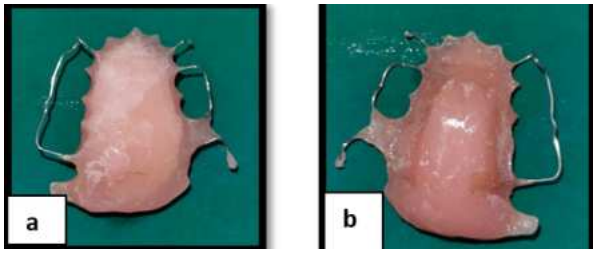
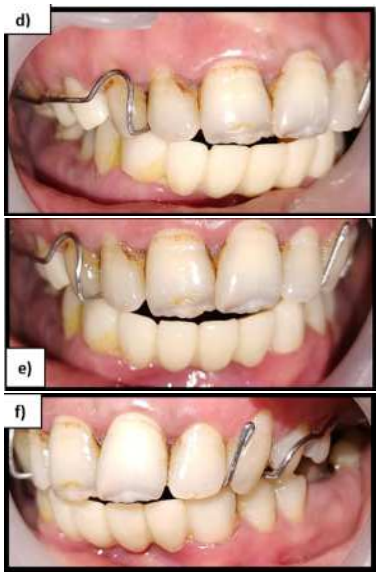


Fig 5: Definitive prosthesis
a) Cameo Surface
b) Intaglio surface

Fig 5: Definitive prosthesis in the oral cavity



Palate was smoothed and made free of rugae so that food could be removed more easily when eating. The lost salt method was used to create a hollow prosthesis. The prosthesis was delivered to the patient and after a day and a week, follow-ups were conducted. In an attempt to help the patient swallow better, they were asked to forcefully suck saliva into their pharynx. In order to enhance her speech articulation, she was also instructed to perform exercises that involved her lips, cheeks, and floor of mouth, such as blowing and sucking exercises.

DISCUSSION

To keep food on the occlusal surface of the teeth, the tongue and cheeks work together. It is also essential for the development and passage of the food bolus into the pharynx. [2]Increased space between the palate and the floor of the mouth, as well as little to no tongue movement, can also cause food adherence to the palate and the inability to clear food particles from the palatal vault.

Since the tongue is the main articulator for speech, learning the position of the tongue for a given sound is crucial in speech. Altered speech is also caused by the lack of tongue contact with the hard palate (linguopalatal), soft palate (linguovelar), alveolar ridge (linguoalveolar), and teeth (linguodental).

Sound originates in the lungs and travels through the vibrators, or vocal folds, in the larynx. Along the way, it is modified by the larynx, pharynx, nasal cavity, and oral cavity, which act as resonators to reinforce the original sound wave as it travels to the outside.[3] To improve the final sound, it also necessitates precise synchronisation between multiple articulators. As they move closer to one another, the articulators create an obstruction that alters the characteristics of the air.

The velum and tongue, the velum and pharynx, the lips and teeth, and the vocal folds are the primary articulators. The point of maximum obstruction is the articulation place;

Nonetheless, glossectomy undoubtedly prevents the production of linguodental, linguoalveolar, linguopalatal, and linguovelar sounds. This basic knowledge was applied to do the functional wax technique [4]

In these situations, the goal of the prosthodontic rehabilitation is to reduce the space in the mouth to facilitate speech and to move food down the oesophagus for effective swallowing. Both the prosthodontist and the patient find the rehabilitation process to be undoubtedly difficult in these situations. Static prostheses have limited functional utility because they cannot replace the tongue's ability to move infinitely during swallowing and speaking.

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