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Prosthodontic Rehabilitation of Patient with Total Glossectomy with Acrylic Tongue Prosthesis Using Precision Attachments: A Case Report

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Abstract:
Total glossectomy affects speech, mastication and swallowing to a greater proportion. It may also lead to psychological impairment of the patient. Prosthetic rehabilitation of tongue using tongue prosthesis, efficiently improves speech and deglutition abilities of the patient leading to a better quality of life. This article presents a clinical case report of prosthodontic rehabilitation of completely edentulous patient who underwent total glossectomy with acrylic tongue prosthesis using precision attachments.
Key Word*:Glossectomy, Tongue Prosthesis, Precision attachment*

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I. Introduction

Twenty-six percent of oral cancers and 0.7% of all cancers occur on the tongue[1]. The most common localization is the lateral side of the tongue[2]. Frequent treatment includes surgical excision, radiotherapy, chemotherapy, or a combination of both. However, partial or total glossectomy is usually combined with other resection procedures such as partial mandibular resection, radical neck dissection, surgical reconstruction using a localized flap or a donor-free flap removed, and possibly radiotherapy. All of these actions can lead to speech changes, chewing difficulties, and impaired swallowing mechanism, putting the patient at risk for mild to severe aspiration. Severe aspiration can lead to aspiration pneumonia with subsequent morbidity and even death.
Bordoni B, Morabito B, Mitrano R, et al. (December 05, 2018) The Anatomical Relationships of the Tongue with the Body System. Cureus 10(12): e3695. DOI 10.7759/cureus.3695

Reconstructive tongue surgery and rehabilitation are effective options for functional recovery after partial or total glossectomy. Successful reconstructive surgery allows patients to regain speech, although its effect on functional improvement is difficult to predict. However, tongue reconstruction surgery is not possible in all patients with glossectomy, including patients with tumour recurrence.[3]

A tongue prosthesis is a prosthetic rehabilitation method that can provide relief if tongue reconstruction isn't possible or effective. Prosthetic designs vary depending on the patient's needs and the type and extent of the operation. For a total glossectomy, the preferred method is to use a tongue prosthesis. With this type of prosthesis, speech and resonance are improved, food is easily directed into the oesophagus, tissues are protected, and socialization is improved through improved appearance.[4]

This article presents a clinical case report for the prosthetic rehabilitation of a patient with total glossectomy using precision attached tongue prosthesis.

II. Case Description

A 57-year-old male patient reported to Smilez Dental Care & Implant Centre, Udaipur with chief complaint of difficulty in chewing, speaking and swallowing.

He had a history of squamous cell carcinoma for which he had undergone total glossectomy and bilateral modified neck dissections to remove the residual tumour. The resulting defect was immediately reconstructed with a microvascular free flap.

Intraoral examination revealed completely edentulous maxillary and mandibular residual alveolar ridges. Obliteration of mandibular ridge and lingual vestibule was also observed due to resection and free flap reconstruction. Patient showed limited mouth opening of 21mm. (Fig 1)After clinical assessment, it was decided

to fabricate maxillary and mandibular complete denture with precision attached tongue prosthesis attached with mandibular complete denture.

Primary impression was made of maxillary and mandibular arch and floor of the mouth using impression compound. After the disinfection of the impressions, primary casts were obtained. Custom trays were fabricated on primary casts with auto polymerizing acrylic resin, followed by border molding using low fusing green stick compound and secondary impressions was made with medium viscosity elastomeric addition silicone.

The impressions were disinfected and poured with type III dental stone to obtain master cast. On the master cast, temporary record bases were made using auto polymerizing acrylic resin which were tried in patient's mouth to check retention and stability. Jaw relation record was made and transferred to the articulator. Teeth arrangement was done and tongue prosthesis was fabricated with wax on the mandibular record base, which was contoured in the shape of a tongue according to the maxillary denture that conforms to oral cavity dimensions with rounded edges. Final texture of the tongue was obtained by using gauge and nylon bristles after heating the wax prosthesis over the burner flame.

The teeth arrangement and try-in was done to verify the retention, stability, and aesthetics of the prosthesis, at same time the wax pattern of tongue prosthesis was also tried in the patient mouth and it was reduced according to the maxillary denture. Then the denture and tongue prosthesis were cured, finished, and polished.

After the final denture and acrylized tongue prosthesis were fabricated, the precision attachment (Rhein83) was used to attach the tongue prosthesis with mandibular complete denture. The male component was attached in the mandibular denture (Fig 2) and the female component was attached in the tongue prosthesis (Fig 3,4). Prostheses were inserted in patient's mouth and postinsertion instructions were given (Fig 5). Post operative speech evaluation was done two days after insertion of the prosthesis.

Follow-up was done after 24 h, 1 week, 1 month, and periodically after every 6 months for the period of 3 years.

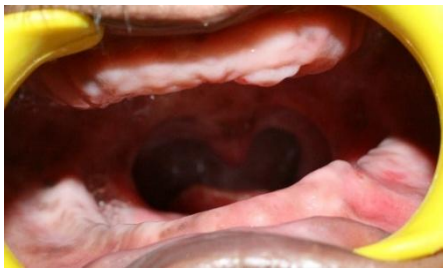

Fig 1: Intraoral view after total Glossectomy.

Fig 2: Mandibular Denture with Rhein83 attachment (Male component)

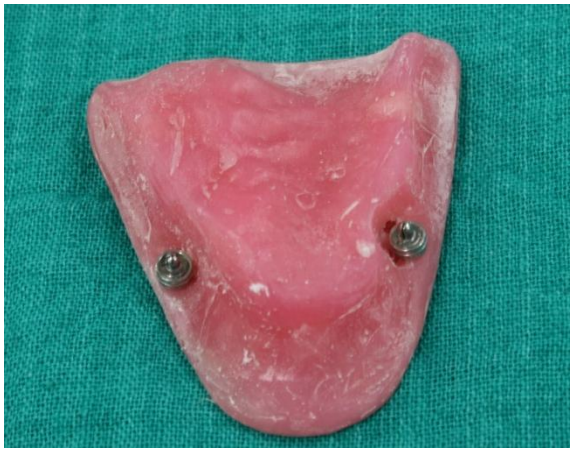

Fig 3: Tongue Prosthesis with Rhein83 attachment (Female component)

Fig:4 Intra Oral view of Mandibular Denture

Fig:5 Intraoral view of Tongue Prosthesis attached with Mandibular denture

III. Discussion

The tongue plays a vital role in many bodily functions such as swallowing, breathing, speaking, and chewing. Its action is not limited to the oral cavity, but also affects the strength and position of the muscles of the lower extremities. The tongue is an organ with an autocrine / paracrine mechanism of action for the synthesis of various substances for interaction with the whole body; According to the line of thought, this is also an extension of enteric system. Therefore, defects of tongue impair mentioned functions of the tongue.[5]

When a patient undergoes a partial or total glossectomy, the ability to chew, swallow, and articulate vowels and consonants in speech changes dramatically. The size, location, and extent of the defect affects the degree of difficulty swallowing or speaking. Areas of surgical resection affecting tongue function include removal of the anterior tip of the tongue, lateral glossectomy, removal of the base of the tongue, and total glossectomy.[3]

Restoring the function of chewing, swallowing and speech with the help of prosthesis is a difficult task for both the prosthodontist and the patient.[6] Moore suggested that tongue prosthesis is the treatment of choice for total glossectomy.[7] The design of the prosthesis provides the patient with a total or partial glossectomy a certain degree of comfort and functionality; mostly it's aesthetic.

The tongue prosthesis can be rigid(acrylic) or flexible(silicone) from acrylic or silicone. It attaches to the mandibular denture bases, covering the alveolar process, as well as the floor of the mouth. It is fabricated in such a way that the dorsum of the anterior two-thirds of the tongue aligns with the anterior of the palate and comes in contact with it when the teeth in occlusion. The posterior one third of the tongue is fabricated in such a manner that it act as a funnel.[6]

In this case report, author has selected heat cure denture base resin due to its easy availability, good strength and good shelf life. As there was limited mouth opening, precision attachment was used so that mandibular complete denture and tongue prosthesis can be inserted separately into the patient's mouth and then connected with each other through precision attachment.

When constructed in an organized manner with the assistance of the speech therapist, the mandibular denture with tongue prosthesis can achieve the following:[8,9]

(1) A decrease in the volume of the oral cavity, thereby improving the resonant properties; (2) Directing food into the oesophagus using a trough dug into a prosthetic tongue; (3) Protection of underlying soft tissues; (4) The appearance of the surface of the residual tongue in contact during speech and swallowing; (5) Improvement in appearance, psychological and social adaptation and acoustics.

IV. Conclusion

Patients with oral carcinomas often have resection of the tongue, floor of the mouth or mandible. Thus, postoperatively, these patients encounter alteration in speech, difficulty in mastication, and compromise of the swallowing mechanism.

Prosthodontic rehabilitation through tongue prosthesis can aid in alleviating these problems. Although tongue prosthesis may not replace the intricately mobile structure of the tongue, which is capable of infinite movements in swallowing and speech, but it do provide glossectomy patient with a certain degree of comfort and function. It improves articulation and resonance, more easily directed food into the esophagus, protects tissues and enhances socialization through improved appearance.

References

[1]. Davis JW, Lazarus C, Longman J, et al: Effect of a maxillary glossectomy prosthesis on articulation and swallowing. J Prosthet Dent 1987;57:715-719
[2]. Chi AC: Epethelial pathology. In Neville B (ed): Oral and Maxillofacial Pathology (ed 3). St Louis, Elsevier, 2009, p 415
[3]. Muthu kumarBalasubramaniam et al., Rehabilitation of Glossectomy Cases with Tongue Prosthesis: A Literature Review Journal of Clinical and Diagnostic Research. 2016 Feb, Vol-10(2): ZE01-ZE04
[4]. Yarramaneni V, Balakrishnan D, Aparna IN, Kapoor S. Prosthetic Management of Total Glossectomy Patients. Int J ProsthodontRestor Dent 2016;6(3):66-68.
[5]. Bordoni B, Morabito B, Mitrano R, et al. (December 05, 2018) The Anatomical Relationships of the Tongue with the Body System. Cureus 10(12): e3695. doi:10.7759/cureus.3695
[6]. Laaksonen JP, Lowen IJ, Wolfaardt J, Rieger J, Seikalay H, Harris J. Speech after tongue reconstruction and use of a palatal augmentation prosthesis. An acoustic case study. Canadian Journal of speech- language pathology and Audiology. 2009;33(4):196-202.
[7]. Zaki HS. Prosthodontic rehabilitation following total and partial glossectomy. In: Clinical Maxillofacial Prosthetics. Taylor, T.D. Ed pp. 205-214, Quintessence Publication Co.
[8]. Aramany MA, Downs JA, Beery QC, Aslan Y. Prosthetic rehabilitation for glossectomy patients. J Prosthet Dent 1987;57:608-11.
[9]. Moni AK, Mohit S. Subramania Iyer. Recent advances and controversies in head and neck reconstructive surgery. Indian J Plast Surg. 2007;40:3-12.

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