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RESEARCH ARTICLE

PROSTHETIC REHABILITATION OF A COMPLETELY EDENTULOUS PATIENT WITH XEROSTOMIA AND SUNKEN CHEEK USING AN UNCONVENTIONAL COMPLETE DENTURE-A CASE REPORT

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ABSTRACT

The management of completely edentulous patients with xerostomia with sunken cheek, pose a significant challenge to the prosthodontists. The overall goal of rehabilitating such individuals is focused on improving phonetics, esthetics, proper occlusion and masticatory function. Salivary reservoirs are often incorporated in the dentures of xerostomic patients to hold and dispense the artificial saliva. The major disadvantage of the conventional salivary reservoir is the reduction of the tongue space. This article describes the fabrication of the salivary reservoir in a patient with sunken cheeks and shallow palate, in which the esthetic correction of the sunken cheeks was achieved together with minimal encroachment into the tongue space. Additionally, neutral zone impression technique for the resorbed mandibular arch and recording of palatogram was also done

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INTRODUCTION

Xerostomia is defined by the glossary of prosthodontic terms as dryness of the mouth from lack of normal secretions. Xerostomia is a symptom, not a diagnosis or a disease. It is a subjective feeling of oral dryness [1]. This term encompasses the spectrum of oral complaints voiced by patients with dry mouth (Greenberg, 2003). Xerostomia disrupts the normal homeostasis of the oral cavity, leading to changes in the taste, difficulty in speech, difficulty in swallowing and decreased dietary intake. These have a significant negative impact on patient's health and overall quality of life (Brosky, 2007). Moreover, as saliva acts as a thin film between the dentures and the oral mucosa, its absence decreases retention of the dentures and increases inflammation and ulceration in the oral cavity (Hallikerimath, 2012) Several treatment options are available to the clinician depending on the etiology of xerostomia. Most cases require symptomatic treatment and include changes in dietary pattern, patient counseling, lifestyle modifications, salivary stimulants, and use of salivary substitute. A salivary reservoir denture is an effective solution in edentulous patients with xerostomia to deliver salivary substitute constantly into the patient's mouth without affecting the normal routine (Vissink, 1984). This article aims to provide a simple method for the fabrication of the maxillary salivary reservoir in a patient with sunken cheeks and shallow palate, in which the esthetic correction of the sunken cheeks was achieved together with minimal encroachment into the tongue space (Fig.1)

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CASE REPORT

A 60-year-old female patient reported to the department of prosthodontics, Goa dental college and hospital, India with a chief complaint of difficulty in eating and speech due to dryness of mouth. The patient presented with a history of carcinoma of supraglottis for which she underwent surgery and radiotherapy 3 years back. The patient reported concerns about facial esthetics because of her sunken cheeks. She gave no history of previous denture use. Extra oral examination showed a mesoprosopic face form with slumped cheeks. On intraoral examination, revealed completely edentulous upper and lower ridges, a shallow palate, hyper pigmentation of buccal mucosa and angular cheilitis. After discussion and planning, it was decided that the patient should be given a cheek plumper with a salivary reservoir to improve her overall appearance and aid her in her daily oral activities.

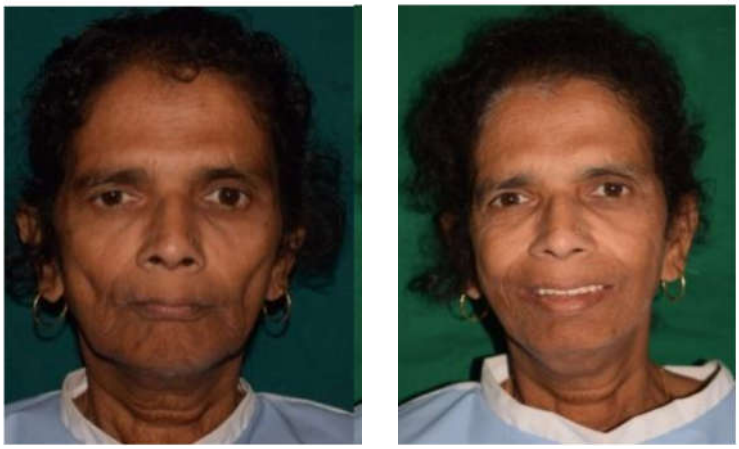

Figure 1. Pre and post operative patient photograph

Figure 2. Palatogram to assist in positioning of lid

Figure 3. A Bioplast template pressed on the stone duplicate of the contoured trial denture that acts as a guide while designing the reservior

Figure 4. Wax up of the reservoir with undercut on inner aspect and groove all around for retention of lid

Figure 5: Putty spacer adapted on palatal and buccal flange area of both side

Figure 6. Removal of soap spacer

Figure 7. Fexible lid for reservoir

Figure 8. Finished and polished denture

Clinical Procedure

- Maxillary and mandibular impressions were made using impression compound (Y Dents, MDM Corporation, Delhi).
- Custom trays were made using autopolymerising acrylic resin.
- Border molding was done using low fusing impression compound (Aslate, Asian Acrylates, Mumbai) and wash impressions were made with medium body addition silicone impression material (Aquasil, Dentsply/ caulk). A mandibular impression was made using the admix technique (McCord, 2000).
- Jaw relation records were obtained followed by a neutral zone recording for the mandibular denture, which was recorded using a tissue conditioner (Visco-gel; Dentsply Ltd., Weybridge, UK) (Kursoglu, 2007).
- This was followed by a trial of the waxed dentures. Arbitrarily addition of wax was done on the buccal flange areas of the maxillary denture in the premolar and molar regions to evaluate changes in the patient's facial esthetics which will support the sunken cheeks acting as cheek plumpers. The palatal contours were captured using tissue conditioner material (Visco-gel; Dentsply Ltd., Weybridge, UK) and confirmed using a palatogram. The palatogram assisted in the placement of reservoir lid such that it would not interfere with speech of the patient.(Fig .2)
- The contoured upper trial denture was duplicated with the help of an irreversible hydrocolloid impression material (Vignette chromatic, Dentsply) and poured in type III dental stone (Kalstone, Kalabhai Pvt., Ltd., Mumbai, India) to obtain a working cast. A 5. 1 mm thick BIOPLAST transparent sheet (Scheu Dental GmbH, Iserlohn, Germany) was then pressed on the stone duplicate of the contoured trial denture using BIOSTAR (Scheu Dental GmbH) heat and vacuum press. This sheet acted as a guide while designing the reservoir.(Fig .3)
- The tissue conditioner material was removed from the palatal aspect of the upper trial denture and wax up for the reservoir lid rim was completed with the help of inlay wax (Inlay wax medium, GC India Dental Pvt Ltd). (Lid rim is a part of reservoir onto which the flexible lid of the reservoir will fit. It has a slight undercut on the inner aspect for retention and a groove all around the periphery to engage with the v shaped notch on the outer surface of lid rim).(Fig 4)
- The waxed trial denture were invested and dewaxed in conventional manner.
- After dewaxing, 2 mm thickness of modeling wax was adapted on two halves of the separated flask to ensure adequate thickness of acrylic resin around the planned hollow cavity.
- For achieving the hollow cavity, a temporary three dimensional spacer was fabricated first using putty consistency of an addition silicone impression material (Zeta Plus, Zhermac) on palatal and buccal flange area of both sides and was replaced by a replicated soap spacer (Pear, Hindustan Unilever Ltd., Mumbai, India) which was fabricated in accordance with the temporary putty spacer. (Fig no-5)
- During trial closure, temporary putty spacer was placed, hollow space obtained was evaluated after dewaxing for the accuracy of positioning of soap spacer. The hollow space was then filled with a soap spacer, and final closure performed.
- After acrylisation, the upper denture was deflasked and finished in the usual manner. The soap spacer was retrieved through openings made in the denture base distal to the second molar on both the sides and from the reservoir lid opening in the palate. The denture with the openings was immersed in water overnight and flushed out using an air-water syringe. The hollow cavity was air

dried and sealed with auto polymerizing acrylic resin.(Fig.6)

- The finished maxillary denture was duplicated using an irreversible hydrocolloid impression material to obtain a second working cast. Accurate reproduction of the reservoir periphery is checked on the second working cast.
- A 2-mm thick flexible BIOPLAST transparent sheet was pressed in a BIOSTARR heat and vacuum press on the obtained second working cast after blocking out the reservoir space with a mixture of plaster and pumice. Care was taken not to block the undercut on the inner aspect of the reservoir lid rim.(Fig-7)
- The pressed clear lid rim was cut accurately and tried onto the denture. Edge of the lid should enter the groove and notches on the denture and flush with the palatal contours.
- The palatal and cheek plumper cavity was loaded with 2.5ml artificial saliva (E saliva). A release hole was made at the most dependent point on the flexible lid of palatal salivary reservior. The most dependent point helps in release of salivary flow whenever tongue touches the lid in function, for example, sucking.
- Upper and lower denture were then finished, polished and delivered, the patient was assessed after a week, and minor adjustment were done (Fig 7)

DISCUSSION

Many patients who undergo treatment for oral cancer receive a course of radiation therapy. The prevalence of postradiation xerostomia is reported to be 90% (Sultana, 2011). This article provides a simple approach toward management of xerostomia in patients with shallow palate and sunken cheek. It presents a easy method of creating a hollow space in a maxillary denture using a single flask method which is quite easy to fabricate and the material used is soap that is easily retrievable. Advantages of this technique are that is a Simple technique, cost-effective, laboratory procedures are less time-consuming, physiologic mechanism of salivary release, easy to use, clean, and refill the reservoir, sustained and slow release of salivary substitute. This device has no effect on the phonetics and comfort of the patient since appropriate palatal contours have been developed and confirmed through palatogram assessment (Upadhyay, 2012). There is easy visibility of salivary substitute in the chamber, easy accessibility to the reservoir by the dentist and patient. In this technique the lid is constructed with flexible BIOPLAST which is widely used for fabrication of soft splints and bleaching trays, which is biocompatible and does not lose its resiliency. Disadvantages are additional laboratory steps, manual refill of the reservoir at regular intervals, high degree of precision is mandatory to ensure accurate and smoothly fitting the reservoir lid. The volume of reservoir by this technique was 2.5 ml for a working duration of 2 hours.

The highlight of this technique used here is that it allows fabrication of a prosthesis that makes swallowing a control mechanism for the flow of salivary substitute. As the patient swallows, the tongue contacts the anterior portion of the palate and hence the thermoplastic membrane. This creates positive pressure inside the reservoir thus pushing the salivary substitute out of the outlets. Then, the pressure is relieved, air is sucked in creating a negative pressure, and the next cycle starts (Chatterjee, 2014). On follow-up examination, it was noticed that maintenance and clean ability of the dentures was adequate and the patient was satisfied by her appearance.

Conclusion

In summary, this paper reports a technique for the fabrication of the maxillary reservoir denture as one of the treatment option for edentulous patients with xerostomia. The main advantage of this technique was that laboratory steps involved are simple and are less time consuming.

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