

CLINICAL REPORT

A Novel Technique of incorporating Salivary Reservoir in a Complete Denture Patient: A Case Report

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ABSTRACT

Xerostomia is usually associated with systemic health problems. The most common difficulty of xerostomia patients is intolerance and poor retention in removable dentures due to dry mouth, mucositis, glossitis, and lack of thin salivary film. The presented case report describes the new technique of incorporating a salivary reservoir in a maxillary complete denture. The technique of fabrication is simple, cost-effective, provides good lubrication to oral tissue, and easy to clean and maintain by the patient.

Keywords: Xerostomia, reservoir denture, complete denture.

INTRODUCTION

Saliva is the most important biofluid of the human body system which often gets ignored. Saliva helps in complete denture retention, keeps the oral cavity moist, aids in chewing, swallowing, speaking. It has also got antimicrobial and buffering action. Thus, any alteration in salivary flow rate can adversely affect oral health and overall health.^[1]

Xerostomia is a common clinical condition caused by diabetes mellitus, Sjogren's syndrome, salivary gland diseases, depression, and side effects of medication, old age, head and neck radiation.^[2] The inadequate salivary flow and lubrication negatively affect the complete denture retention, makes the tissues more prone to irritation and infection.^[3] Stimulation of salivary flow can be increased by sugar-free gums, lozenges, drinking plenty of water, sialagogues such as pilocarpine.^[1,4] Another approach of providing the optimal lubrication in an edentulous patient is by reservoir denture.^[5] Thus, it is important for the dentist to properly plan the treatment in a complete denture patient.

This case paper presents a case of an edentulous patient suffering from aplastic anaemia who was

successfully treated with a simple but effective form of reservoir denture.

CASE REPORT:

The 45-year-old male patient reported to the Department of Prosthodontics, complaining of dry mouth and discomfort while eating and chewing. Intraoral examination showed a completely edentulous maxillary and mandibular arch and dry tongue. Medical history revealed the patient was suffering from Aplastic Anemia and he was on medication. The treatment plan advised to the patient was a salivary reservoir for the maxillary arch and conventional mandibular denture.

TECHNIQUE:

Primary impressions were made in impression compound (Pinnacle, DPI, India) while final impressions were made in light body elastomeric impression material (Aquasil Ultra LV Dentsply Caulk) since zinc oxide eugenol paste could have caused a burning sensation to the patient. The maxillo-mandibular relation recorded and try-in was done (fig.1). At the time of try-in appointment, the

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maxillary denture base was covered by wax and tissue conditioner (GC Soft Liner, GC Corporation, Japan) was applied on the palatal surface and palatal contours were recorded (fig.2) with all the functional movements of the tongue and checked for patient comfort and speech.



Fig. 1 Try In Centric Relation



Fig. 2 Application of Soft Liner For Recording The Palatal Contour

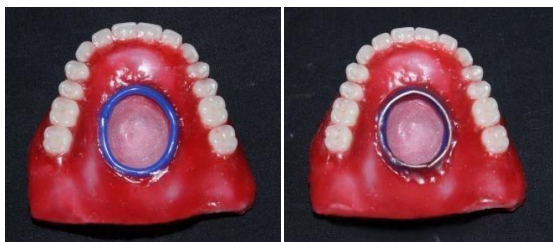


Fig. 3 Reservoir Made With Sprue Wax And Orthodontic Wire



Fig. 4 Processed Maxillary and Mandibular Denture

After palatogram assessment, tissue conditioner from trial denture was removed and a reservoir wall was built in sprue wax (SIGMADENT, India) and orthodontic wire was incorporated on the reservoir

lid rim to provide smooth gliding motion (fig.3). Care was taken to create a slight undercut on the inner and outer aspects of the lid rim. A groove was made all around the lid rim with Le Cron carver. This technique will help in providing the snap-fit of the flexible lid and the processing of denture was carried out in the conventional method followed by finishing and polishing of denture (fig.4).



Fig.5 Duplication of Denture for Fabrication of Reservoir Lid



Fig.6 Cast duplication with Type III Dental Stone and Blocking of Reservoir Space with Dental Plaster



Fig.7 Placement of Modelling Wax for Fabrication of Reservoir Lid



Fig.8 Packing of Molloplast B For Reservoir Lid Fabrication

The reservoir lid was fabricated by the duplication of maxillary denture with condensation silicone putty and light body (Zermac, Zetaplus) (fig.5), and type III dental stone (Kalstone, Kalabhai Pvt Ltd., Mumbai, India) was poured to obtain the working cast (fig.6). At this stage, the volume required for a substitute was confirmed and space was blocked with dental plaster (Kaldent, Kalabhai Pvt Ltd.) (fig.6). The flexible lid was fabricated by adapting 2mm thickness of modelling wax (Deepti Dental Products, Ratnagiri, India) on a reservoir index (fig.7). Flasking, dewaxing was carried out in a conventional way, and at the packing stage, 'Molloplast-B' (Buffalo dental manufacturing Syosset NY) was added (fig.8) and kept in boiling water for 60 min. After polymerization (fig.9), the lid was snugly fitted on palatal reservoir (fig10), and thereafter a 1 mm hole was created on the most dependent part using a probe. This completed the fabrication of the reservoir and lid. The instruction was given to the patient for filling the reservoir space with the salivary substitute with the help of a calibrated syringe (fig.11) and denture insertion was done (fig. 12, 13). It releases the liquid when the tongue creates pressure on the flexible lid during deglutition and speech. Follow up of patient was done at 24 hrs, 48 hrs, 1 week, and 3 weeks and checked for patient comfort.



Fig.11 Refilling The Reservoir With Salivary Substitute



Fig. 12 Denture Insertion

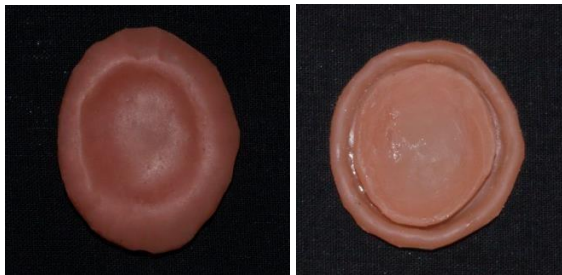


Fig.9 Processed Reservoir Lid



Fig. 13 Pre Treatment And Post Treatment Photograph



Fig. 10 Reservoir Lid in Place

DISCUSSION:

This case report illustrates the use of Molloplast B silicone material for the fabrication of a reservoir lid. Molloplast B is a tasteless, odorless, non-irritant, biocompatible, clinically tested, and scientifically documented material. The advantage of this material is that it does not contain plasticizers and therefore does not change its consistency secondary to leaching. In addition to that, it can be polymerized simultaneously with acrylate when making the new denture either in a water bath or microwave and it bonds firmly with the acrylic denture. In the case of maxillary reservoir denture, the thickness of the palate was increased primarily in the palatal vault area with a minimum increase at the periphery of the palate.^[6] An increase in thickness at the region of contact areas of the tongue affects the speech profoundly.^[7] The Volume of the reservoir

was 4.5 mL with a working duration of 2 to 2.5 hours.

A variety of fabrication method has been described in the literature for reservoir denture. Joseph et al^[8] and Shah et al^[9] used 1mm thickness of thermoplastic sheet for the fabrication of lid on maxillary denture. Burhanpurwala et al^[10] used snap-on buttons for orientation of two-piece mandibular reservoir denture along with clear acrylic tissue bearing plate to visualize the patient about the level of salivary substitute in the denture. Upadhyay et al^[6] used a resilient liner on the floor of the palate for the construction of reservoir space. Verma et al^[11] used lego blocks and precision buttons for the construction of split dentures. Vissink et al.^[12] used rubber dam material which allows slow release of saliva.

Thus, the given technique provides easy accessibility to dentists and patients to reservoir mould, ease in fabrication, cost-effectiveness. Repair and relines is easy in the maxillary denture than the mandibular split denture. The limitation of this technique is manual dexterity is required for refilling the salivary substitute at regular intervals^[13], bulky dentures, meticulous cleaning with 2% sodium hypochlorite to prevent the fungal infection.^[6,13] Artificial saliva is contraindicated in conditions like asthma, iritis, and glaucoma as they cause tachycardia, bradycardia, sweating, and increased smooth muscle tone.^[14]

CONCLUSION:

Saliva plays a critical role in the success of a complete denture. Thus, reduced quality and quantity of saliva may have an adverse impact on oral health. This method is innovative, simple, easy to fabricate, affordable, provides good lubrication, and keep the tissue moist. The success of the treatment depends on finding the root cause, elimination of etiological factors, and method of fabrication with skillful prosthodontic treatment.

CONFLICT OF INTEREST

There is no conflict of interest

REFERENCES:

1. Sachdeva S, Noor R, Mallick R, Perwez E. Role of saliva in complete dentures: an overview. *Ann dent spec.* 2014;2(2):51-4.
2. Verma K, Gowda EM, Pawar VR, Kalra A. Salivary reservoir denture—A novel approach to battle

- xerostomia. *Medical journal, Armed Forces India.* 2015 Jul;71(Suppl 1):S190.
3. Basker RM, Davenport J C, Thomason J M. *Prosthetic Treatment of the Edentulous Patient.* 5th Ed. UK: Wiley Blackwell. 2001. Pg 232-34.
4. Fox PC, van der Ven PF, Baum BJ, Mandel ID. Pilocarpine for the treatment of xerostomia associated with salivary gland dysfunction. *Oral surgery, oral medicine, oral pathology.* 1986 Mar 1;61(3):243-8.
5. Singh OP, Mittal N, Saini R. How to manage xerostomia in prosthodontics???. *Dental Journal of Advance Studies.* 2013 Dec;1(03):144-51.
6. Upadhyay SR, Kumar L, Rao J. Fabrication of a functional palatal saliva reservoir by using a resilient liner during processing of a complete denture. *The Journal of prosthetic dentistry.* 2012 Nov 1;108(5):332-5.
7. Sharry JJ. *Complete denture prosthodontics.* 3rd ed. New York: McGraw-Hill Medical Publications; 1974. p.136-48.
8. Joseph AM, Joseph S, Mathew N, Koshy AT. Functional salivary reservoir in maxillary complete denture—technique redefined. *Clinical case reports.* 2016 Dec;4(12):1082.
9. Shah RM, Ajay Aras M, Chitre V. An innovative and simple approach to functional salivary reservoir fabrication. *Journal of prosthodontics.* 2015 Jun;24(4):339-42.
10. Burhanpurwala MA, Magar SK, Bhandari AJ, Gangadhar SA. Management of an edentulous patient having xerostomia with artificial saliva reservoir denture. *The Journal of Indian Prosthodontic Society.* 2009 Apr 1;9(2):92.
11. Verma K, Gowda EM, Pawar VR, Kalra A. Salivary reservoir denture—A novel approach to battle xerostomia. *Medical journal, Armed Forces India.* 2015 Jul;71(Suppl 1):S190.
12. Vissink A, Huisman MC. Construction of an artificial saliva reservoir in an existing maxillary denture. *The Journal of Prosthetic Dentistry.* 1986 Jul 1;56(1):70-4.
13. S. B. Lagdive, R. B. Umbarkar, S. S. Lagdive, D. S. Gandhage, A. J. Bhandari, and S. A. Gangadhar, "Dentures as artificial saliva reservoirs in the irradiated edentulous cancer patient with xerostomia," *Indian Journal of Basic & Applied Medical Research.* 2011;1(1):31–37. Murthy V, Yuvraj V, Nair PP, Thomas S. Prosthodontic management of radiation
14. Murthy V, Yuvraj V, Nair PP, Thomas S. Prosthodontic management of radiation induced xerostomic patient using flexible dentures. *Case Reports.* 2012 Mar 20;2012:bcr1120115250.

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