

Artificial Saliva Reservoir Denture : Managing Edentulous Xerostomic Patient : A Case Report

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ABSTRACT

Xerostomia is a clinical condition caused by a decrease in the production of saliva. It may present itself as a local symptom, as a part of systemic disease, as side effects of medications or following therapeutic radiation to the head and neck regions. Xerostomia can lead to difficulties during management in patients receiving prosthodontic treatment. To help overcome this problem, various techniques have been proposed for incorporating reservoirs that contain salivary substitutes into dentures. This paper presents the management of a patient suffering from xerostomia who was successfully treated by providing reservoir denture that provided good lubrication for the tissues, was hygienic, and was made from routine denture base material.

KEYWORDS: Reservoir denture, xerostomia, artificial saliva.

INTRODUCTION

Xerostomia is defined as dry mouth resulting from reduced or absence of the salivary flow. Xerostomia can be due to systemic conditions like Rheumatic, Sjogren's Syndrome, Salivary gland diseases, Diabetes mellitus, Parkinson's disease, Dysfunction of immune system like HIV/ AIDS, due to head and neck radiation^{1,2}, medication-related side effects.^{3,4}

Treatment of patients suffering from xerostomia can be a challenge and more so in the completely edentulous. The difficulties encountered can be troublesome and at times may lead to complete failure of the prosthesis. Oral dryness is one of the most common and most unpleasant oral symptom which adversely affects all oral functions and compromises oral health in any affected individual. It leads to numerous oral sequelae

including mucosal dryness, difficulty in chewing, swallowing and speaking, burning and pain of oral mucosa, propensity to damage of oral mucosa and infection^{5,6}, demineralization of teeth and increase in caries, halitosis and difficulty in wearing dentures. Therefore, for maintaining good oral and general health, saliva should be secreted in an adequate quantity and quality⁷. In the patients with dentures and insufficient saliva, the lack of lubrication can result in traumatic ulcerations of the mucosa, and increased susceptibility to oral fungal infection, candidiasis⁸.

Various treatment modalities have been suggested in the literature to overcome the problem of Xerostomia in complete denture patients. A variety of approaches have been used to supply xerostomic patients with a

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moist oral environment. These include, increasing the frequency of water intake, changing dietary habits by including more citrus fruits in the diet, salivary stimulants which include sugar free chewing gums or lozenges⁹.

Incorporating reservoirs containing salivary substitutes into dentures is one of the treatment modalities. Dabas et al.¹⁰ described new split denture technique which resulted in a reservoir denture that provided good lubrication of the oral tissues and can be easily cleaned by the wearer and can be produced from routine denture materials.

Saliva substitutes containing thickening agents for longer relief and increased moistening and lubrication of the oral surfaces have been developed. These are available as solutions, sprays or gels and have multiple contents such as carboxymethylcellulose, electrolytes and flavouring agents e.g. wet mouth (ICPA Health Products Ltd), Aquawet (Cipla Ltd).

This article describes a case report of a Xerostomic patient successfully treated with Split denture containing a reservoir, where traditional treatment modalities were unsuccessful.

CASE REPORT

A 75-year-old male patient reported to the Department of Prosthodontics, ITS Dental College and Research Centre, Greater Noida with the chief complaint of difficulty in mastication and speaking with dryness of mouth and throat, burning sensation and frequent need for sipping water.

Intraoral examination revealed completely edentulous upper and lower ridges with dry, thin and friable mucosa, dry cracked tongue, and minimal frothy saliva in the floor of the

mouth. Patient reported with a medical history of Hypertension from last 5–6 years and Diabetes Mellitus from last 10–12 yrs. The patient was on medications for the same. The patient's general practitioner was also contacted and the medications were reduced or altered to reduce the xerostomia. The patient was given multivitamin supplements. He had been advised to use salivary substitute (methyl cellulose) regularly and frequently drink water to overcome the dryness and discomfort. But patient still suffered from dryness of mouth and discomfort. After discussion and planning, it was decided to fabricate a set of maxillary and mandibular dentures with salivary reservoir incorporated in mandibular denture. The procedure for fabrication is outlined below.

TECHNIQUE

1. Primary impressions were made in putty rubber base impression material while final impressions were made in light body polysiloxane (Addition type) impression material (Aquasil, Dentsply, Germany,) since zinc oxide eugenol paste may cause burning sensation to the patient.
2. The master casts obtained were duplicated using reversible hydrocolloid impression material and poured in Type 3 dental stone.
3. The second pair of master casts was kept aside for later use.
4. The maxillo-mandibular relationship was recorded and then articulated after face bow transfer and teeth arrangement was done on first set of master cast. Shorter teeth were selected for mandibular denture to have a deeper area for future placement of reservoir. The trial was done to patient's satisfaction.

5. Using the same vertical dimension the second set of casts was mounted as well.
6. On the 2nd set of mounting, wax up for base section was done on mandibular cast. The distance between the upper margin of the waxed up base segment and upper teeth should be the length of mandibular teeth approximately 3 mm for adequate thickness of acrylic. (Fig 1).



Fig 1. Mounted wax up of mandibular base section with 3mm space for acrylic

7. Attachment screws were kept in place, two in molar region on both sides and one in anterior region and kept parallel to each other. These were incorporated to help in fitting the two segments of the denture that is clear acrylic base section and pink acrylic teeth section together.
8. Putty index was made with impression of maxillary teeth on one side and impression of attachment screws on the other side for reorientation.
9. This wax up for base section along with attachment screws was flaked and packed with clear heat cure acrylic resin. (Fig 2)



Fig 2 . Mandibular clear acrylic base section with reservoir and attachments

10. A duplicate of clear acrylic base section was made using reversible hydrocolloid impression material and poured in the dental stone. The maxillary trial denture was kept in place on No. 1 model and articulated with the duplicated stone model of the mandibular clear acrylic base section with the help of putty index made earlier for reorientation.
11. Mandibular denture teeth were waxed up on the duplicate of clear acrylic base section (Fig 3). The waxed up teeth section was then flaked and processed in pink heat cure acrylic resin.

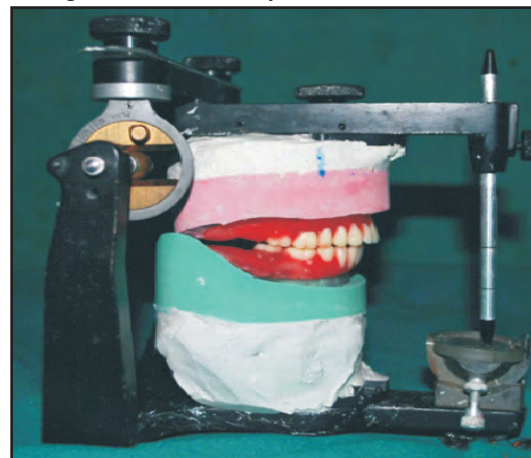


Fig 3. Mandibular denture teeth waxed up on the duplicate of clear acrylic base section

12. After careful deflasking, the pink acrylic teeth segment of the mandibular denture was attached to clear acrylic base segment through attachment screws. Polishing was done with both segments together to ensure a flush, smooth finish and no damage to edges. (Fig 4)



Fig 4. Artificial Saliva placed in reservoir and two segments fitted together

13. Reservoirs were cut as clearly and smoothly as possible to facilitate easy cleaning into the clear acrylic base segment of the mandibular denture in premolar region on both sides using acrylic trimmer.
14. A 0.5 mm diameter round bur was used to drill a drainage hole from the inferior aspect of lingual flange of the denture into the reservoirs on both sides.
15. The patient was instructed for routine denture and oral hygiene maintenance. He was taught how to open and close the reservoir denture for cleaning and filling the artificial salivary substitute in the denture.

The artificial saliva used in this case was “wet mouth”(Carboxymethylcellulose) (ICPA Health Products Ltd) . The split denture was inserted and adjusted in the patient mouth and post-operative instructions were given to the patient. Patient was kept on recall appointments of 1 week, 3 weeks, 3 months

and after 6 months. During the follow up appointments size of the drainage hole was adjusted to ensure the flow of saliva up to minimum of 3–4 hours. Patient had to refill the reservoir after every 3–4 hours. Patient found a great relief in his symptoms of dry mouth and was satisfied with the denture.

DISCUSSION:

There are array of approaches described in the literature for incorporating reservoirs in dentures used for management of Xerostomia patients. The split denture technique offer clinician with an alternative method of treating Xerostomia with additional advantages of ease of loading salivary substitute and ease of cleaning the reservoir and adjustment of reservoir as needed.

In addition to this the lower member of the denture is fabricated in clear acrylic helps determine the size and position for placement of reservoir, in addition patient can also easily visualize the contents of the reservoir and the need for refilling of the salivary substitute. Another advantage of this technique is that it utilizes routine denture materials. However, laboratory stages are time consuming and precision is essential to ensure accurate and smooth fitting of the segments.

CONCLUSION:

This article provides a novel approach in management of the xerostomic patient by fabricating an artificial saliva reservoir denture made from routine denture base material. The technique is simple , denture is easy to clean, and it provides good lubrication to the oral tissues. Patient was found to be immensely benefitted from it.

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