

**Full Length Research Paper**

Xerostomia- A Clinical Challenge

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Xerostomia is the subjective sensation of dry mouth. Many drugs, especially those with anticholinergic effects, can cause xerostomia, particularly in the elderly. Another major cause is radiotherapy of the head and neck. For cure in head and neck cancer dose of radiotherapy more than 60Gy are needed though the tolerance of normal organs e.g. salivary glands varies between 32Gy to 46Gy, thus damaging the salivary glands. Treatment is based on either stimulating the flow of remaining salivary tissue with lollies or sialogogues such as pilocarpine, or wetting the mucosa with water or artificial saliva containing glycerine or compounds such as carboxymethylcellulose. This paper presents a case report of a patient suffering from xerostomia who was successfully treated with a reservoir denture.

Key Words: Reservoir denture, Xerostomia, Maxillary**Introduction**

Neglected by dentists and ignored by physicians, saliva is the least known and the least appreciated of all the body fluids. Yet, this lowly secretion plays a vital role not only in the integrity of the oral tissues but there also exists a definite inter - relationship between saliva and various aspects of prosthodontic treatments.

Normal daily secretion of saliva is approximately 1L to 1.5 L per day (i.e. 0.5 ml/min -1 ml/min) although flow rate varies depending on diurnal variation, hydration, food intake and many other factors. The estimated flow rates of salivary glands are as follows: parotid (65%~0.26 ml/min), submandibular (20%-30% ~0.08 ml/min), sublingual (6%~0.03 ml/min) and minor salivary glands (5%~0.03 ml/min).

Xerostomia is dryness of mouth from lack of normal secretions.¹ Xerostomia is a common patient complaint that could be a result of systemic conditions like rheumatic, Sjogren's syndrome, salivary gland diseases, Diabetes mellitus, Parkinson's disease, dysfunction of immune system like HIV/ AIDS, head and neck radiation and medication-related side effects². Patients suffering from xerostomia may complain not only of dry mouth, but also of difficulty in normal oral and oropharyngeal functions including eating, speaking and swallowing. Increase susceptibility to infection is also seen. In case of denture wearers, extreme discomfort is a common complaint.

Case Report

A 65-years old edentulous male patient reported to the Department of Prosthodontics, Crown & Bridge, Subharti Dental College, Meerut with the chief complaint of difficulty in mastication, dryness of mouth and severe discomfort while speaking, eating and swallowing. Intraoral examination revealed maxillary and mandibular edentulous residual ridges, areas of irritation associated with the maxillary denture and dry tongue. Patient's mouth was noted to be very dry with cracks at the corner of the mouth. Medical history revealed that the patient had undergone radiotherapy treatment for squamous cell carcinoma of larynx for past 5 years. Fabrication of maxillary complete denture with salivary reservoir and conventional mandibular denture was planned. Following procedure was followed:

Procedure

Primary impressions were made with impression compound followed by final impressions which were made using special trays using non eugenol zinc oxide impression paste (Cavex) as zinc oxide eugenol can cause burning sensation to the patient's mouth. The dentures were then fabricated in the conventional manner till try in stage. At try in stage, two pieces of 2mm thick modelling wax was

laid over the palatal wax used in arranging the denture teeth which were later on removed but a rim of wax remained to form the reservoir. The assembly was processed with heat cured acrylic resin. After the deflasking and polishing procedures were completed, wax was poured into the reservoir space. Another layer of wax was added on the previous layer after application of separating medium on the wax and a lid was made. This second layer of wax was also processed with heat cure acrylic resin. Afterwards, the previous layer of wax was dewaxed and the lid was permanently attached to the denture with the help of autopolymerising acrylic resin. The completed prosthesis was then finished and polished.

Detail post-insertion instructions were given to the patient about how to separate and clean the two halves of the denture respectively. Patient was instructed to wet dentures before placing them into the mouth and spraying or inserting artificial saliva into the prosthesis. Use of salivary substitutes (wet- mouth) and artificial saliva aid in adhesion, stability and denture retention. Wetting dentures before meals and taking more fluids during mealtime helps in mastication and swallowing. Patient was instructed to flush out the reservoirs weekly with 1% sodium hypochlorite solution and clean the reservoirs daily with either a small toothbrush or bottlebrush. Post insertion check up was done after a day and regular recall visits were scheduled. The patient was satisfied with the prosthesis.

Discussion

This technique resulted in a denture that provided good lubrication of the oral tissues could be easily cleaned by the wearer and is simple to fabricate. Salivary mucins possess rheological properties that include elasticity and adhesiveness, which aid in retention of dentures. So in xerostomia, dentures invariably become loose^{3,4}.

Depending upon the cause, variety of treatment options are available. In medication induced xerostomia, dosage, timing, or a change in medication may reduce the severity of the problem. In such cases, measurement of a patient's non-stimulated salivary flow rates before and after altering their medication may be useful in the success of treatment. Gustatory stimulation of the salivary glands by mastication of sugar free chewing gums or lozenges is also helpful. In severe xerostomic cases, saliva substitutes or salivary stimulants may be used. To minimize patient discomfort, soft denture liners can also be used. Often, a combination of treatments may be required.

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 flavoring agent's e.g. wet mouth (ICPA Health Products Ltd), aqwet (Cipla Ltd)^{5,6}. However, the main problem is to deliver this substitute constantly into patient's mouth without affecting his normal routine.

Advantages of this technique includes - clearly visualization of the levels of saliva substitute within the chamber, ready access to the reservoirs, both by the patient and by the dentist, allows easy cleaning and adjustment of the reservoirs as needed. The drawback of the technique is the additional laboratory steps but it can be of great utility in cases of xerostomia. The salivary substitute also has to be mechanically introduced in the oral cavity by the patient at regular intervals.

Apart from fabrication of denture reservoirs in xerostomic patients, split dentures can also be fabricated. In such cases, the clinical stages during construction are routine and require less chair-side time. However, laboratory stages are time consuming and precision is essential to ensure accurate and smoothly fitting segments. Additionally, repairs and relines of a split denture become more complex. Case selection is also extremely important. Cutting reservoirs into the denture weakens its structure, so only cases with sufficient vertical dimension and thickness are suitable for this technique.

Conclusion

In summary, this paper presents a novel technique for the fabrication of a maxillary denture incorporating a salivary reservoir. Xerostomic patients form a unique group in whom prosthodontic treatment is challenging. Successful treatment depends on knowledge and recognition of their particular problems and methods of prevention combined with skillful prosthodontics. Xerostomic patients wearing Prostheses can benefit immensely from it. This method utilizes routine materials during construction.

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