INTRODUCTION

Xerostomia is a symptom, not a diagnosis or a disease. It is a subjective feeling of oral dryness. The term xerostomia is used to encompass the spectrum of oral complaints voiced by patients with dry mouth resulting as a side-effect of many drugs, head and neck radiotherapy, autoimmune diseases and aging. The resultant hyposalivation leads to serious oral health and functional problems such as oral soreness, burning mouth mucosa, halitosis, crown and root caries, yeast infections, impairment of speech and swallowing, altered taste sensation and severe discomfort in wearing complete or partial dentures. This article presents a case report of salivary gland hypofunction as a result of aging, successfully treated with palatal salivary reservoir in upper denture and hollow space reservoir in lower complete denture. Keywords: Salivary gland hypofunction, Xerostomia, Saliva reservoir, Artificial saliva.

CASE REPORT

A 67 years old male patient with a chief complaint of missing upper and lower teeth and presented with complaint of burning sensation of mouth, feeling of thirst and frequent urge to drink water. He also presented discomfort in wearing his dentures. Patient had no relevant medical history. Oral examination revealed missing maxillary and mandibular teeth, dry oral mucosa, atrophic mandibular ridge, high palatal vault and increased inter-arch space.

To find out the reason for dry oral mucosa, the salivary flow rate test was done for three consecutive days. Citric acid droplets (lemon extract) was used as a stimulus to increase salivary secretion. Patient was asked to spit in a beaker in an interval of 5, 10 and 15
minutes. The stimulated salivary flow rate was measured was 0.3ml/min which was below the normal flow rate. The unstimulated salivary flow rate was measured in a similar manner without any external stimuli, which was found to be 0.025ml/min. The above test confirmed that the patient was suffering from xerostomia.

A maxillary complete denture with palatal salivary reservoir and hollow space reservoir in mandibular complete denture was planned for the patient.

The treatment procedure was as follows:

1. Preliminary impression of both the arches were made with impression compound and for final impression light body polyvinyl siloxane impression material was used instead of zinc-oxide eugenol impression paste, as eugenol can aggravate the burning sensation of the mouth.
2. Conventional jaw relation and wax try-in procedure was done (Figure 1)

**Fabrication of Maxillary Palatal Salivary Reservoir**

After try-in of waxed denture, a wax-up of the palatal portion of the denture was done. Modeling wax was adapted on the palatal portion in increments while alternatively evaluating patient’s speech. Patient was made to pronounce consonants such as linguoalveolar sounds (t, d, s, z, v and l), linguo-palatal sounds (s, z) and velar sounds (g, k, n) and made to sip and swallow cold water to check any discomfort as a result of palatal wax try-in. The wax-up was thicker in the anterior portion and vault of ridge thinning down to feather edge on the posterior border to make posterior border of reservoir discernible to tongue.

An endodontic file was used to measure the thickness of palatal wax-up in the centre to evaluate the depth of palatal reservoir. An index of the palatal portion of the wax-up was made in stone. This stone index was waxed up with 2mm thickness modeling wax and flasked to form roof of the palatal reservoir. After dewaxing, wax spacer short of the margins by 4-6mm was adapted on the anterior portion of index to form a window. Clear heat cured acrylic resin (Dentsply, Germany) was packed with the wax spacer still in place. After trial closure, flasks were opened, wax spacer removed and heat-cure resilient liner (Molloplast-B) packed and processed to obtain the roof/ lid of the reservoir.

The palatal wax-up was removed. The waxed denture was processed in a conventional manner. The lid of reservoir was attached to the denture using auto-polymerizing resin (Dentsply, Germany) and denture finished and polished, a small hole was made in the centre of the resilient liner to inject artificial saliva. As the patient presses his tongue against the anterior portion of the palate against the resilient liner saliva oozes out slowly from the reservoir space (Fig. 2).

**Fabrication of Mandibular Denture with Hollow Reservoir Space**

The mandibular try-in denture was flasked and dewaxed in conventional manner. A single layer wax was added over the cast and mold to form a mold space for reservoir. Interchangeable flasks were then

![Figure 1: Wax try-in of maxillary & mandibular complete denture](image1.png)

![Figure 2a: Finished & polished denture with lid of reservoir attached using auto-polymerizing resin.](image2a.png)

![Figure 2b: Artificial saliva coming out of hole when applying pressure](image2b.png)
used to process the hollow denture in two parts; the first part being the permanent record base and the second part containing artificial teeth. The two parts of the lower denture were easily oriented and fused with autopolymerizing resin at the borders. Holes were drilled in the lingual flange till the depth of hollow space to inject saliva and for outlet of saliva. (Fig. 3)

**Figure 3a:** Mandibular hollow denture attaching two parts using autopolymerizing acrylic resin

**Figure 4:** Postoperative photograph of the patient.

**DISCUSSION**

Xerostomia due to salivary gland hypofunction can be treated with hydration therapy, mastication of sugar-free chewing gums or lozenges and with cholinergic drugs such as pilocarpine hydrochloride and cevimline hydrochloride. Xerostomia as a side effect of drugs can be treated with reduction in dosage or alternative drug therapy. Acupuncture therapy has shown considerable success in improving the saliva flow rate in patients with xerostomia as a result of radiation therapy.

Use of soft liners and artificial saliva reservoirs within the prosthesis is the most common and recommended treatment option in treating edentulous patients with severe xerostomia.

Mendosa and Tomlinson used split mandibular denture as a reservoir space for artificial space. Though it eliminates the encroachment of tongue space, the amount of artificial saliva in the reservoir space was less. Repair and relining of such dentures are difficult.

Agarwal et al incorporated palatal reservoir with overlying acrylic lid containing stainless steel attachments in maxillary cast partial attachment. Attachment availability, precision in use and cost were the limitations of this technique.

In this case report, the patient had adequate inter-arch space; therefore, mandibular hollow denture with reservoir and maxillary palatal reservoir was planned. The advantage of this design includes simplified techniques, economical materials and less time consuming laboratory procedures. The patient can readily press the palatal portion of reservoir to draw the artificial saliva out. Further improvement of this design may be needed to provide access to clean the reservoir space.

Previous studies suggests that reservoirs in the palatal aspect may be useful in treating xerostomia.

Techniques used in fabrication of maxillary and mandibular reservoir denture may possibly add to the bulk and cost of the denture.

**CONCLUSION**

Salivary gland hypofunction as a result of aging is not an uncommon finding among edentulous patients. Prosthodontists are first line health care providers to treat such patients with artificial saliva reservoir with prosthesis. To meet patient’s functional and esthetic demands, a thorough knowledge and understanding of different saliva reservoir designs and the merits and demerits of each design is essential.

**REFERENCES**

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