Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies *NLM ID: 101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Indian Citation Index (ICI) Index Copernicus value = 100

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Case Report

Palatal Reservoir for Managing Edentulous Dry Mouth: A Case Report

[1]Jeemit Kumar Padliya, [2]Meenakshi T., [3]Arun Gupta, [4]Manish Chaddha, [5]Priyanka Jha

[1,4,5]MDS Prosthodontist, Pacific Dental College and Hospital, Udaipur, India;
[2]MDS Prosthodontist, Oxford Dental College and Hospital, Bengaluru, India;
[3]MDS Prosthodontist, College of Dental Science, Bhavnagar, India

ABSTRACT:
Xerostomia, commonly known as dry mouth, is a condition characterized by reduced salivary production, often linked to medical treatments (e.g., head/neck radiation), systemic diseases, or medication side effects. For denture users, this poses significant challenges, as saliva is essential for securing dentures and minimizing discomfort during use. To address this, innovative prosthetic designs integrating reservoirs for controlled release of artificial saliva have been explored. This article presents a case study demonstrating the effective application of a dual-flasking fabrication technique to create a reservoir-equipped denture. The design successfully maintained oral moisture, promoted hygiene, and enhanced comfort for a patient with chronic xerostomia. Notably, the prosthesis was constructed using conventional dental materials, highlighting its practicality for clinical adoption. This approach underscores the potential of tailored denture solutions to improve quality of life for individuals with salivary dysfunction.Palatal reservoirs offer a viable prosthodontic solution for xerostomia management, particularly in resource-limited settings.
Keywords: Salivary reservoir, Palatal reservoir, Xerostomia, Prosthodontic management of dry mouth

Received: 07 December, 2025 Accepted: 09 January, 2026 Published: 11 January, 2026

Corresponding Author: Jeemit Kumar Padliya, MDS Prosthodontist, Pacific Dental College and Hospital, Udaipur, India

This article may be cited as: Padliya JK, T Meenakshi, Gupta A, Chaddha M, Jha P. Palatal Reservoir for Managing Edentulous Dry Mouth: A Case Report. J AdvMed Dent Scie Res 2026; 14(1):21-26.

INTRODUCTION

Saliva plays a pivotal role in denture retention through adhesion, cohesion, and interfacial tension. Xerostomia, often caused by medications, systemic diseases, or radiation therapy, disrupts these mechanisms, leading to mucosal irritation and compromised prosthetic denture adhesion. This case highlights the fabrication of a palatal reservoir integrated into a complete denture to mitigate dry mouth symptoms, emphasizing its practicality and cost-effectiveness.

CASE REPORT

Patient Information

An 80-year-old male farmer from rural Rajasthan (ethnicity: Asian-Indian) presented with complete maxillary and mandibular edentulous arches and complaints of persistent oral dryness and denture discomfort. Medical history revealed no systemic conditions or medications linked to xerostomia. Following a thorough examination, we discussed the patient's condition with him and obtained informed consent for the fabrication of a denture incorporating a salivary reservoir.

Clinical Findings

Intraoral examination: Atrophic maxillary and mandibular edentulous ridge, dry oral mucosa.

Diagnostic Assessment

Idiopathic xerostomia was diagnosed after excluding Sjögren's syndrome, diabetes, and radiation history.

Diagnostic Challenges

The patient's **limited health literacy** required simplified explanations of the reservoir mechanism. Financial constraints precluded advanced diagnostics (e.g., sialometry), necessitating reliance on clinical exclusion criteria.

Therapeutic Intervention

Prosthodontic Management: A maxillary denture with a palatal reservoir was designed. The reservoir, fabricated using polymerizing resin, housed artificial

saliva (wet mouth). Small channels allowed controlled release into the oral cavity.

Pharmacological Adjuncts: Sugar-free gum, frequent water intake, salivary substitutes and parasympathomimetics such as pilocarpine or neostigmine bromide were advised to stimulate residual salivary function.

Method of fabricating denture

Table 1: Key Milestones in Prosthesis Fabrication

Stage	Timeframe	Outcome
Initial Assessment	Day 1	Diagnosis of idiopathic xerostomia
Denture Fabrication	Days 7–14	Reservoir integrated via dual-flasking
3-Month Follow-Up	Day 90	Improved retention, no adverse events

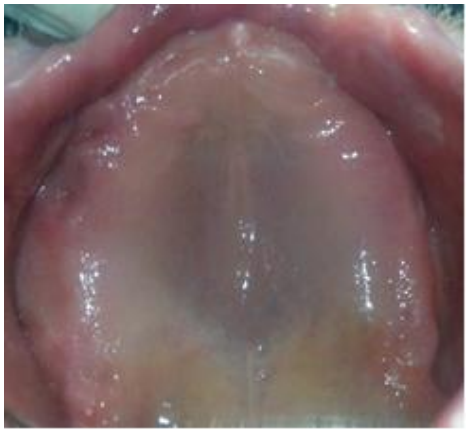

Figure 1 clinical view of maxillary arch

Figure 2clinical view of mandibular arch

Figure 3 maxillary and mandibular primary impression

Figure 4 jaw relation recorded

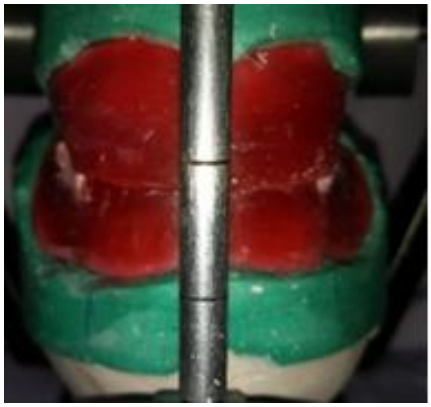

Figure 5 Jaw Relation Mounted On Articulator

Figure 6denture trial clinical view

Figure 7 wax sprue attatched on palatal surface of denture

Figure 8 flasking of denture done

Figure 9 dewaxing of denture done

Figure 10 finished denture with palatal vault

Figure 11 palatal vault filled with wax

Figure 12 dewaxing of flasked denture

Figure 13 table salt filled within palatal vault of denture

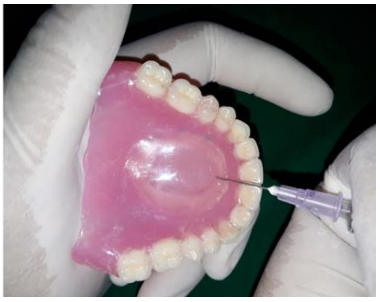

Figure 14 small hole created on palatal surface of denture to remove salt and salivary substitute injected in palatal reservoir

Figure 15 Final Upper Denture With Salivary Reservoir

Figure 16 Salivary Substitute

Figure 17 final denture in patient's mouth

Denture Fabrication Protocol:

1. **Primary Impression**: Made using impression compound and poured with dental plaster.
2. **Custom Tray Fabrication**: A customized special tray was created using self-cure acrylic.
3. **Secondary Impression**: Final impressions was made in light body elastomeric impression material since zinc oxide eugenol paste may cause burning sensation to the patient.
4. **Jaw Relation**: Recorded with an occlusal wax rim mounted on a Hanau articulator, followed by balanced teeth arrangement.
5. **Sprue Attachment**: A sprue wax was attached to the palatal area of polished surface of the maxillary trial denture in a circular manner.
6. **Trial and Acrylization**: A trial denture was evaluated intraorally, followed by dewaxing and acrylization.
7. **Reservoir Creation**: The palatal area was waxed, flasked, and dewaxed. Salt was packed into the space, covered with heat-cure acrylic resin, and processed.
8. **Finishing**: A small hole was drilled on the polished palatal surface using a round bur to facilitate slow release of artificial saliva.
9. **Final denture**: Saliva substitute was filled in that reservoir, Post denture Instruction was given to the patient and explain that how to use salivary reservoir.

Follow-Up & Outcomes

At 3-month follow-up, the patient reported enhanced denture retention and reduced mucosal irritation. No candidiasis or reservoir leakage was observed.

DISCUSSION

Xerostomia management in edentulous patients remains challenging. While systemic therapies (e.g., pilocarpine) and salivary substitutes exist, prosthodontic solutions like palatal reservoirs provide localized relief. This case aligns with **Burhanpurwala et al. (2009)**, who emphasized reservoir efficacy in improving denture adhesion using a dual-flasking method in the mandibular denture. Our technique, however, utilizes a **maxillary palatal reservoir**, which offers a larger capacity and more uniform distribution of saliva substitute, as supported by **Toljanic and Zucuskie (1984)**.

The use of a **physiologic release mechanism**—where tongue pressure during swallowing triggers salivary flow—echoes the innovation described by **Joseph et al. (2016)**, who highlighted the simplicity and cost-effectiveness of such designs. Our method also avoids the complexity of magnetic attachments or precision components, as seen in the design by **Sinclair et al. (1996)**, making it more accessible in resource-limited settings.

The **split-denture technique** introduced by **Mendoza and Tomlinson (2003)** for mandibular reservoirs allows easy cleaning and refilling, but our palatal approach minimizes occlusal interference and maintains denture strength. The **salt-loss technique** used in our fabrication is similar to the method described by **Gurkar et al. (2016)**, ensuring a smooth, cleanable reservoir without additional mechanical parts.

Limitations of our technique include the need for periodic refilling and potential mechanical wear. Future studies should explore long-term outcomes and material innovations.

Patient Perspective

The patient reported, 'The new denture feels natural, and the slow release of saliva keeps my mouth comfortable throughout the day.' He emphasized satisfaction with reduced refill frequency (twice daily) compared to hourly saliva substitutes.

CONCLUSION

The palatal reservoir is a low-cost, effective intervention for edentulous xerostomia patients. It underscores the importance of individualized prosthodontic strategies in improving quality of life.

Revised Follow-Up Section

At 3 months, the patient **adhered to refills** (assessed via self-report and residual saliva checks during visits). No reservoir clogging or mechanical wear was observed.

REFERENCES

1. Humphrey SP, Williamson RT. A review of saliva: normal composition, flow, and function. J Prosthet Dent. 2001;85(2):162-169.
2. Burhanpurwala MA, Magar SK, Bhandari AJ, Gangadhar SA. Management of an edentulous patient having xerostomia with artificial saliva reservoir denture. J Indian Prosthodont Soc. 2009;9(2):92.

3. Joseph AM, Joseph S, Mathew N, Koshy AT. Functional salivary reservoir in maxillary complete denture – technique redefined. Clin Case Rep. 2016;4(12):1082–1087.
4. Toljanic JA, Zucuskie TG. Use of a palatal reservoir in denture patients with xerostomia. J Prosthet Dent. 1984;52:540–544.
5. Sinclair GF, Frost PM, Walter JD. New design for an artificial saliva reservoir for the mandibular complete denture. J Prosthet Dent. 1996;75:276–280.
6. Mendoza AR, Tomlinson MJ. The split denture: A new technique for artificial saliva reservoirs in mandibular dentures. Aust Dent J. 2003;48(3):190–194.
7. Gurkar H, Venkatesh OY, Somashekar JM, et al. Prosthodontic Management of Xerostomic Patient: A Technical Modification. Case Rep Dent. 2016;2016:8905891.