IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 24, Issue 10 Ser. 2 (October. 2025), PP 16-18
www.iosrjournals.org

"Maxillary Hollow Denture Made Easy: Plaster-Pumice-Sugar Syrup As A Space Maintainer – A Case Report"

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Abstract -
The weight of maxillary complete dentures can significantly affect retention and patient comfort, especially in cases of severe ridge resorption. Hollow dentures offer a practical solution by reducing weight while maintaining function. Various techniques have been proposed, including the use of putty materials; however, their removal can be challenging, often leaving residue, or requiring additional steps.
This case report describes an innovative approach to fabricating a maxillary hollow denture using a plaster, pumice, and sugar syrup mixture as a space maintainer. Unlike putty materials, this mixture dissolves easily in warm water, leaving a clean, hollow space without mechanical removal.
Keywords*: Hollow maxillary denture, space maintainer, resorbed ridges.*

Date of Submission: 28-09-2025 Date of Acceptance: 08-10-2025

I. Introduction

Retention and stability are key to maxillary complete dentures. Factors like tissue adaptation, peripheral seal, and optimal weight ensure function and comfort. However, anatomical variations such as a shallow palatal vault, may result in increased height and weight of the prosthesis, further compromising its retention and stability[1]

Excessive weight in conventional solid dentures worsens this issue. A hollow maxillary denture provides a practical solution by reducing weight while maintaining strength. This case report presents a clinical case where a plaster-pumice spacer technique was used to fabricate a hollow denture, addressing retention challenges while ensuring durability and proper fit.

II. Case Report

The patient, A 60-year-old male, reported to the Department of Prosthodontics, Crown & Bridge and Implantology with a chief complaint of difficulty retaining his maxillary complete denture. He complained that the denture frequently dislodged during speech and mastication, despite proper fitting and adjustments.

Intraoral examination revealed the following key findings:
Palatal Vault: The maxillary palatal vault was notably shallow, reducing the area for achieving an effective peripheral seal. (figure1)
Residual Ridge and Vertical Dimension: There was a considerable vertical distance from the residual ridge to the incisal edge of the maxillary anterior teeth. This increased vertical height resulted in the fabrication of a heavy, solid denture base.
Denture Evaluation: The existing denture, due to its weight and design, failed to achieve a proper peripheral seal, contributing to its instability during mastication and speech.

A decision was made to fabricate a hollow maxillary denture. The hollow design aimed to significantly reduce the overall weight of the prosthesis without compromising its strength. Hollow maxillary denture is highly advantageous as it reduces the weight of acrylic resin[1],

Stepwise Procedure For Fabrication Of A Hollow Maxillary Denture.
Clinical Procedure

From diagnostic impression to try-in appointment, the clinical steps are the same as those followed in conventional dentures

Laboratory Procedure

1. Duplication of trial denture: The trial denture was sealed to the master cast, and three stabilizing notches were made. An alginate impression was taken and poured with Type IV dental stone to replicate the trial denture.
2. Fabrication of Thermoplastic: A 1 mm soft thermoplastic sheet was vacuum-adapted over the stone cast to create a template for maintaining uniform hollow space in the denture. (fig. 2)
3. Flasking and Dewaxing: The trial denture was flasked. After dewaxing, it was placed aside for later use. (figure 3)
4. Fabrication of Permanent Denture Base: The lower flask was prepared for the denture base by adapting a 2 mm wax sheet over the master cast. After dewaxing, it was processed with heat-cure acrylic resin. (figure 4)
5. Deflasking and Finishing of Denture Base: After processing and curing, the denture base was retrieved, finished, and repositioned on the master cast in the flask. (figure 5)
6. Fabrication of Hollow Space with Plaster-Pumice Mixture: A 1:1 ratio of dental plaster and pumice was mixed, replacing water with sugar syrup to create a dough-like consistency[2]. The mixture was adapted onto the permanent denture base in the same shape as the occlusal rim. (figure 5)
7. The previously fabricated thermoplastic template was used to verify the width and height of the plaster-pumice spacer, ensuring a minimum of 2 mm space between the teeth and the spacer for adequate denture strength. The 2 mm space was confirmed using an endodontic file perforation through the template. (figure 6)
8. Final Processing: The flask containing the arranged teeth was placed on the side table, and the denture's final processing was completed.
9. Removal of Hollow Space Material: Two holes were made in the posterior ridge, and the denture was soaked in warm water to dissolve the spacer. Residues were removed using orthodontic wire. (figure 7)
10. Sealing the Hollow Denture: The holes were sealed using self-cure acrylic dough. The denture was checked for any leakage. (figure 8)
11. Final Finishing and Polishing: The denture was thoroughly polished. The final prosthesis was prepared for insertion.

Reason For Using Plaster-Pumice-Sugar Syrup As A Spacer

1. Maintains the Hollow Space – The plaster-pumice mix creates a rigid temporary spacer that maintains the hollow cavity during processing.
2. Easy Removal – The sugar syrup makes the spacer water-soluble, so once the denture is processed, immersing it in warm water dissolves the sugar, weakening the core for easy removal
3. Prevents Denture Distortion – Unlike other materials (like wax or silicone), this method ensures the denture remains stable without affecting its fit.
4. Economical and Efficient – Compared to other hollow denture techniques (such as using a putty core or salt technique), this is cost-effective and widely used in prosthodontic labs.

III. Discussion

Maxillary denture retention depends on anatomical and prosthetic factors. Because of severe resorption the restorative space between maxillary and mandibular residual ridges is increased. Rehabilitation in such cases may result in increased height and weight of the prosthesis further compromising its retention and stability[1]. A hollow maxillary denture was fabricated using a plaster-pumice spacer to reduce weight while maintaining strength. A hollow maxillary denture is highly advantageous as it reduces the weight of acrylic resin[3]. A thermoplastic template ensured uniform hollow space and an endodontic file with a rubber stop was used to measure the space between the matrix and the processed base[4]. The final prosthesis enhanced retention, function, and patient satisfaction, demonstrating the effectiveness of weight reduction in prosthodontic rehabilitation.

IV. Conclusion

The case report highlights a new method for creating a maxillary hollow denture using a plaster-pumice and sugar syrup mixture as a space maintainer. This technique effectively reduces the denture's weight, enhancing retention and patient comfort, especially for those with severe ridge resorption. The patient in this report experienced improved retention and satisfaction, demonstrating the technique's effectiveness in prosthodontic rehabilitation

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Legend

Fig 1	Shallow Maxillary Arch Of Patient
Fig 2	Thermoplastic Template
Fig 3	Flasking Of Trial Denture
Fig 4	Flasking Of Wax Denture Base
Fig 5	Plaster Pumice Syrup Dough As Spacer
Fig 6	Measuring The Space Uding Endodontic File With Spacer
Fig 7	Processed Hollow Deture Showing Two Holes Posteriorly To Remove The Spacer By Dissolving It
Fig 8	Finished Denture

FIG 1

FIG 2

FIG 3

FIG 4

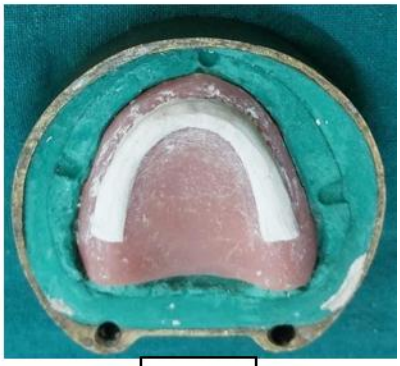

FIG 5

FIG 6

FIG 7

FIG 8