Fabrication of a Closed Hollow Bulb Obturator Using the Lost Salt Technique – A Case Report

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***Abstract*—Maxillary defects following surgical intervention can result in oro-nasal communication, leading to speech difficulty, nasal regurgitation, and masticatory inefficiency. Prosthodontic rehabilitation using an obturator restores essential oral functions and enhances patient comfort and quality of life. This article presents a case of prosthetic rehabilitation of a completely edentulous patient with an Aramany Class I maxillary defect using a closed hollow bulb obturator fabricated by the lost salt technique with powdered denture cleansing tablets, resulting in a lightweight and functionally efficient prosthesis.**

***Index Terms*—Maxillectomy, Hollow bulb obturator, Lost salt technique, Maxillary defect, Denture cleansing tablet**

I. INTRODUCTION

Resection of the maxilla due to benign or malignant conditions results in communication between the oral and nasal cavities, compromising speech, mastication, and swallowing. Obturator prostheses are designed to restore these functions and improve esthetics and patient morale. However, conventional obturators are often heavy, reducing retention and patient tolerance. A hollow bulb design significantly decreases prosthesis weight, enhancing comfort and retention. This case report presents the fabrication of a closed hollow bulb obturator using a modified lost salt technique with denture cleansing powder as a spacer in a patient with a long-standing Aramany Class I maxillary defect.

II. CASE REPORT

A 56-year-old male patient reported to the Department of Prosthodontics with a chief complaint of difficulty in speech and accumulation of food particles into the nasal cavity during eating.

III. HISTORY

The patient had undergone surgical excision of a benign maxillary tumor approximately 10 years ago, resulting in an oro-nasal communication on one side of the maxilla. [Fig 1] He had been rehabilitated with an obturator prosthesis six months after surgery and had been using the same prosthesis for nearly a decade. Over time, the prosthesis had become ill-fitting due to alveolar resorption and material degradation, leading to air leakage during speech and food regurgitation. The patient was otherwise healthy, with no medical contraindications for prosthodontic treatment.

IV. EXAMINATION

Extraoral examination revealed mild depression in the midfacial region corresponding to the surgical site. Mouth opening and mandibular movements were within normal limits. Intraoral examination showed completely edentulous maxillary and mandibular arches. The maxillary defect corresponded to Aramany Class I, involving the resection of the maxilla along the midline and extending to the hard palate on one side, with communication into the nasal cavity. The tissues were well-healed and healthy.

V. DIAGNOSIS

Completely edentulous maxilla and mandible with Aramany Class I maxillary defect secondary to

surgical resection of a benign tumor, presenting with functional difficulties in speech and deglutition due to poor adaptation of the existing obturator prosthesis.

VI. TREATMENT PLAN

A new definitive closed hollow bulb obturator was planned to restore oro-nasal separation, improve phonetics and mastication, and reduce prosthesis weight. The lost salt technique using powdered denture cleansing tablets was chosen for creating the hollow cavity due to its simplicity and efficiency.

VII. CLINICAL AND LABORATORY PROCEDURE

Primary impression of the maxilla, including the defect area, was made using impression compoun, ensuring proper extension and coverage. [Fig 2] A custom tray was fabricated on the preliminary cast using self-cure acrylic resin (PMMA), and border moulding was performed with low-fusing impression compound to capture functional depth and contour. The final impression was made using light body elastomeric impression material, [Fig 3] which accurately recorded the defect and adjacent tissues. The master cast was poured with type IV gypsum, and jaw relations were recorded using conventional methods, followed by a wax try-in to verify esthetics, vertical dimension, and occlusal balance. For fabrication of the hollow bulb, a duplicate cast of the master cast was prepared, and an acrylic plate was fabricated with heat-cure PMMA to form the superior wall or roof of the bulb portion. [Fig 4] This plate was positioned at the defect site, and the defect cavity was filled with powdered denture cleansing tablet material, which acted as a space-maintaining medium. [Fig 5] The assembly was then packed with heat-cure PMMA and processed in the conventional manner. After curing and finishing, a small access opening was created using a No. 702 carbide bur to flush out the residual denture cleansing powder by injecting water through a disposable syringe. Once the entire content was removed and the cavity thoroughly rinsed and dried, the access hole was sealed with self-cure acrylic resin. [Fig 6] The lightness of the obturator was confirmed when it floated on the surface of a water-filled container, indicating successful hollowing. [Fig 7]

VIII. INSERTION AND FOLLOW-UP

The obturator was inserted and checked for peripheral seal, retention, and stability. [Fig 8] The patient immediately demonstrated improved speech clarity, absence of nasal regurgitation, and enhanced comfort. Post-insertion instructions were given on hygiene and handling. At one-week and one-month follow-ups, the patient reported satisfactory retention, phonetics, and comfort with no irritation or leakage.

IX. DISCUSSION

Successful rehabilitation of maxillary defects depends on restoring functional efficiency while ensuring comfort and retention. The lost salt technique is a simple, cost-effective method for creating hollow obturators without complex flasking or double-processing steps. Using powdered denture cleansing tablets as a spacer offers an advantage of easy dissolution, less porosity, and cleaner cavity formation. The closed hollow bulb design ensures hygiene, prevents food accumulation, and improves resonance during speech. Long-term success relies on accurate impression techniques, proper occlusal balance, and periodic maintenance.

X. CONCLUSION

The hollow bulb obturator fabricated with the lost salt technique using powdered denture cleansing tablets is a simple and reliable approach to reducing prosthesis weight. This method provides improved comfort, retention, and speech while being economical and easily reproducible, thus enhancing the overall quality of life of maxillectomy patients.

Figures

Figure 1: Maxillary defect with oro-antral communication

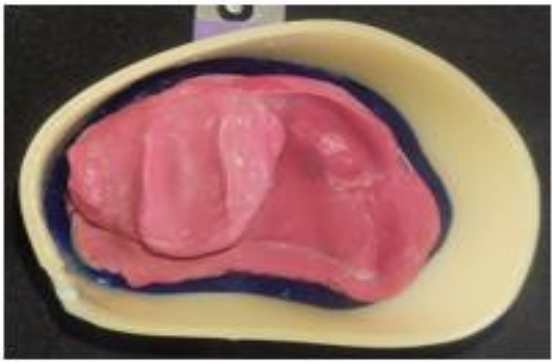

Figure 2 : Primary impression of the maxillary defect made using

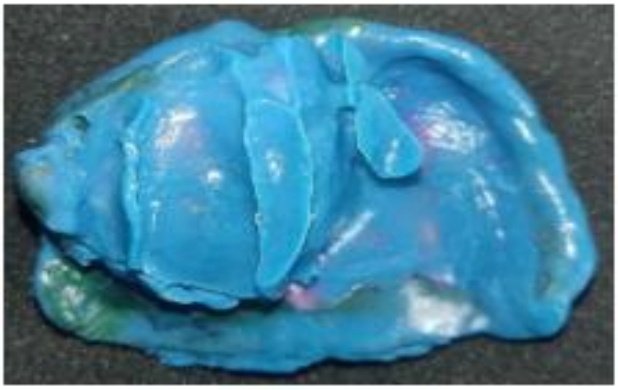

Figure 3: Final impression

Figure 4: Acrylised portion forming the roof of the hollow bulb

Figure 5 : Placement of powdered denture cleansing tablet as spacer in the bulb cavity prior to final processing.

Figure 6 : Final acrylisation of the obturator

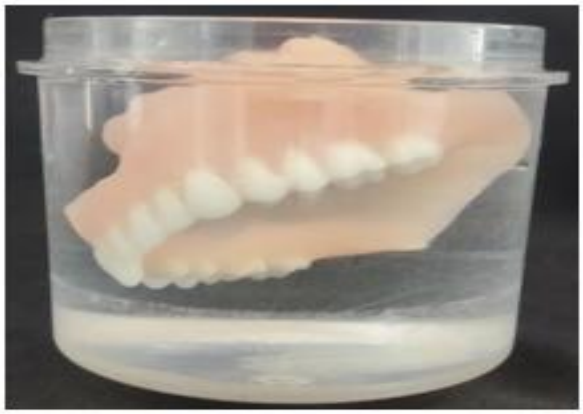

Figure 7: Floating of the obturator immersed In water indicating successful hollowing

Figure 9: Final Insertion of the Obturator

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