

A CASE REPORT

Comprehensive Management of Dentigerous Cyst with Hollow Bulb Obturator: From Interim to Definitive Prosthesis

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ABSTRACT

Background: This case report details the comprehensive prosthodontic management of a 17-year-old female diagnosed with a dentigerous cyst on the left side of the maxillary arch, requiring an Aramany class 2 maxillectomy. The report emphasizes the use of a hollow bulb obturator from interim to definitive stages to restore function and aesthetics.

Case Description: The patient underwent an immediate surgical obturator fabrication and insertion post-surgery, followed by an interim hollow bulb obturator after three months of primary healing. The definitive obturator was introduced at six months post-secondary healing, incorporating root canal-treated teeth with a cast partial denture framework to enhance stability and retention.

Results: The sequential use of immediate, interim, and definitive obturators effectively restored oral function, aesthetics, and patient confidence. Regular follow-ups ensured optimal fit, comfort, and adaptation to the prostheses.

Conclusion: The staged approach using hollow bulb obturators provided significant clinical benefits in managing a maxillary dentigerous cyst. Despite the complexity of the fabrication process and the need for patient adaptation, the outcomes highlight the importance of personalized treatment plans and interdisciplinary collaboration in achieving successful prosthodontic rehabilitation.

Keywords: Dentigerous cyst, Maxillectomy, Hollow bulb obturator, Prosthodontic rehabilitation, Maxillary defect, Interdisciplinary approach.

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INTRODUCTION

A dentigerous cyst, or follicular cyst, is an odontogenic cyst associated with the crown of an unerupted or developing tooth. It is the second most common type of odontogenic cyst and usually occurs in the second and third decades of life. The cyst forms due to the accumulation of fluid between the reduced enamel epithelium and the crown of an unerupted tooth. Treatment typically involves surgical removal of the cyst and the associated tooth, which may result in defects requiring prosthodontic management.¹

The classification of maxillary defects by Aramany ² provides a systematic approach to designing obturator

prosthesis. Aramany classified maxillary defects into six classes, which are based on the location and extent of the defect in relation to the remaining structures of the maxilla. This classification aids in planning obturator prostheses by considering factors such as retention, support, and stability.

The prosthodontic management of patients with maxillary defects, including those resulting from the removal of dentigerous cysts, involves a multidisciplinary approach to restore function and aesthetics.³ A maxillary obturator is a removable prosthesis designed to close a congenital or acquired tissue opening, primarily in the hard and/or soft palate, improving the patient's ability to

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speaking, swallow, and chew. The obturator can be classified into surgical, interim, and definitive types based on the stage of treatment and the healing process. Surgical obturators are used immediately after surgery to assist in healing, interim obturators are used during the post-surgical phase, and definitive obturators are provided after complete healing has occurred.⁴

CASE REPORT

This report details the case of a 17-year-old female diagnosed with a dentigerous cyst on the left side of the maxillary arch, classified as an Aramany class 2 maxillectomy.

Procedures:

1. Fabrication of Immediate Surgical Obturator:

An impression was made before the removal of the dentigerous cyst using alginate, and a cast was fabricated. The operating site was poured with plaster of Paris to accurately delineate the tooth structure and surrounding anatomical features. Modifications to the cast, specifically on the surgical site in the left side of the maxillary arch, were made following the oncologist's and surgeon's instructions. Clasps were placed on teeth 11, 14, and 16 using 19-gauge wire to ensure retention and stability of the prosthesis. The immediate surgical obturator was fabricated with heat-cure clear acrylic resin and inserted immediately after surgery. Necessary modifications were made to accommodate the surgical site, and adjustments were applied to the clasps. The patient was regularly followed up, and the obturator was relined with a soft liner until primary healing of the surgical site was achieved. Patient was under regular follow-up and interim obturator was fabricated at the end of three months post primary healing. [Figure 1]

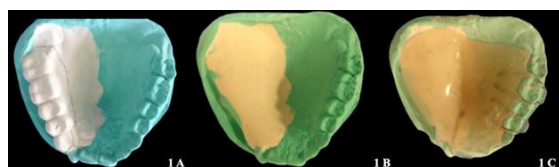


Figure 1: Fabrication of Maxillary immediate obturator - A, B - Cast modification and C obturator with clasps; Plaster of Paris side indicates the defect side

2. Fabrication of Interim Surgical Obturator:

During the 3rd month follow-up, intramural examination was made and the healing seems to be satisfactory. The Impression was made using

alginate for the fabrication of interim hollow bulb obturator. The defect site was closed with wet gauze to prevent the aspiration of impression material and for the easy retrieval of the impression from the surgical site and the working cast was fabricated. On the working cast, build a plaster pillar 2mm away from all the walls of the defect to provide hollow for the immediate obturator. The trial base was constructed with occlusal rims. Followed by jaw relation was done. The articulated model was used for teeth arrangement and clasp fabrication. The interim obturator was fabricated using conventional processing methods. The interim obturator provided only with 24 and 25 artificial teeth for aesthetics. [Figure 2]



Figure 2: Fabrication of Maxillary Interim obturator - A- Alginate impression, B- Cast with plaster pillar on the defect side and C - Relined Maxillary interim obturator with clasp and 24, 25 artificial teeth for aesthetics

3. Fabrication of Definitive obturator:

Patient was under regular followup and definitive obturator was fabricated at the end of six months post-secondary healing was satisfactory. The primary alginate impression was made to construct plaster pillar for mimicking the hollow in the obturator and for the fabrication of trial acrylic denture base on the defect (left) side. Intentional root Canal was performed due to non-vitality of tooth followed by tooth preparation was done in relation to 21,22 and 23 and rest seat in relation to 16 and 17. And impression was made using addition silicone putty and light body as two stage impression technique to fabricate cast partial denture with crowns for root canal treated teeth (21,22 and 23). The trial was done for both cast partial denture framework and trial acrylic denture base on defect side individually. Then both of them oriented together and combined using acrylic resin. Occlusal rims fabricated, teeth arrangement was done with minimal intercuspation to reduce occlusal load on the defect side and also only 24, 25 and 26 arranged for the same reason. Followed by wax trial done. And then flasking was done using two pour technique. The definitive maxillary obturator was retrieved, trimmed, finished and

polished. After the initial review of obturator, 21,22 and 23 crowns with ball attachment was cemented using Glass ionomer cement (Type 2). Followed by cast partial denture framework with acrylic portion on the defect side was inserted in to the ball attachment using yellow coded orthodontic rubber to fit the prosthesis. [Figure 3 , Figure 4 and Figure 5]



Figure 3: Fabrication of Maxillary Definitive obturator - A- Alginate impression, B- Cast with trial denture base using acrylic resin on the defect side, C - cast partial denture framework with 21-23 porcelain fused ceramic crowns, D - Cast partial denture framework with plaster pillar on defect side and E - Framework with trial denture base fused and occlusal rims

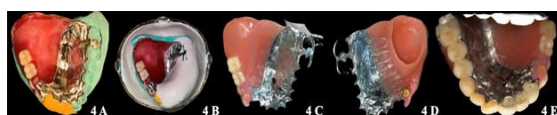


Figure 4: Fabrication of Maxillary Definitive obturator - A- Rims with teeth arrangement, B- Flasking, C - definitive obturator (polished surface), D - definitive obturator (Intaglio surface), E- Definitive obturator - Occlusal view



Figure 5: Pre and post operative view of Definitive maxillary obturator - A- Pre operative view, B- Post operative view, C- Right side of maxillary arch, D - Frontal view and E- Left side (defect side of maxillary arch)

DISCUSSION

The patient opted for removable treatment plan due to financial constraints and previous traumatic surgical experience due to Carcinoma. The immediate surgical obturator offers several advantages, facilitating post-surgical healing by protecting the surgical site and maintaining oral function. Its early insertion aids in the recovery of speech and masticatory function, while regular adjustments ensure optimal fit and patient comfort during the healing phase. The interim surgical obturator, often designed with a hollow bulb to minimize weight, further enhances patient experience by facilitating cleaning and preventing food impaction. The inclusion of artificial teeth improves aesthetics, boosting patient confidence during this interim period. Additionally, effective defect closure supports healing and oral hygiene

maintenance. For the definitive obturator, customization using root canal-treated teeth and a partial denture framework significantly improves stability and retention. Functional restoration is enhanced by occlusal adjustment and polished surfaces, contributing to better masticatory efficiency and patient adaptation. Long-term benefits include improved oral function and aesthetics through the integration of the definitive obturator with dental prostheses.^{5,6} However, the fabrication process poses challenges due to its complexity, involving multistage procedures such as root canal treatment and partial denture construction, which extend the treatment duration and require advanced technical skill for precise impression techniques and framework fabrication. Patient compliance and adaptation also present challenges, with an initial discomfort and adjustment period necessary during the transition to the definitive obturator. Proper patient education on oral hygiene and maintenance is crucial for the long-term success of the prosthesis. Clinically, tissue response must be carefully monitored over time, and regular follow-up appointments are essential to evaluate prosthetic fit, function, and overall patient satisfaction.

The novelty of this case lies in the comprehensive prosthodontic management of a maxillary dentigerous cyst in-volving a staged approach from immediate surgical obturator to interim and definitive hollow bulb obturators. Unlike conventional approaches that often rely on a single prosthesis or less customized treatment, this case emphasizes the use of personalized prosthetic solutions at each stage of healing. The integration of root canal-treated teeth with a cast partial denture framework in the definitive obturator adds a level of functional restoration and retention that surpasses traditional methods. This staged approach allowed for improved stability, patient adaptation, and long-term oral function. In comparison to conventional methods, where patients may receive only a definitive obturator post-healing, the approach in this case ensured continuous prosthetic rehabilitation, starting from the immediate surgical phase. The use of a hollow bulb design in both interim and definitive stages minimized weight, improved comfort, and facilitated oral hygiene,

which are notable enhancements over traditional obturator designs. Additionally, regular follow-ups and the adaptability of the prostheses to the changing oral environment contributed to better patient outcomes in terms of aesthetics, function, and overall satisfaction.

CONCLUSION

In conclusion, the comprehensive management of a dentigerous cyst involving an Aramany class 2 maxillectomy demonstrated effective use of immediate, interim, and definitive obturators. While the approach provided significant functional and esthetic benefits, challenges such as complex fabrication processes and patient adaptation were encountered. Continued research and clinical refinement are necessary to optimize outcomes in similar cases, emphasizing patient-specific treatment plans and interdisciplinary collaboration between prosthodontists, surgeons, and oncologists.

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