

CASE REPORT

Prosthetic rehabilitation of nasomaxillary defect with TAD retained surgical obturator followed by hollow bulb definitive obturator and immediate lower denture

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ABSTRACT

Keywords: Definitive obturator, Hollow bulb, Maxillofacial prostheses, Surgical obturator

The integrity and functionality of the oral cavity may be compromised by nasomaxillary defects, such as speech, mastication, deglutition, and esthetics. Early prosthodontic rehabilitation can improve quality of life and lessen the psychological harm caused by the surgical treatment. A 70-years-old female patient was referred to the Department of Prosthodontics RSUP Dr. Sardjito Yogyakarta with chief complaints of nasal obstruction, and right-side swelling of the face. Extraoral examination revealed facial asymmetry due to swelling of the right buccal region. On intraoral examination, showing a large, firm mass extending from right palate to the midline. A multidisciplinary approach with ENT is required for the surgical treatment. A surgical obturator was made before the surgery, and immediately inserted after with TAD as a retention device. Three months later, a hollow bulb obturator and immediate lower denture was fabricated so the functional capabilities of speech, mastication, deglutition, and esthetics can be restored.. (IJP 2024;5(2):135-137)

Introduction

Nasomaxillary defect rehabilitation with obturator has been defined as holistic treatment care to achieve highest possible result in enhancing postoperative quality of life.¹ The Glossary of Prosthodontic Terms defines an obturator as "a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/soft tissue structures."² Construction protocol of obturator consists of three phases as follows: surgical obturator, interim obturator, and definitive obturator.³

Surgical obturator is the first prosthesis that is inserted at the time of surgery to prevent wound contamination. Interim obturator prosthesis is usually placed during the healing phase of the defect. It has to easily modifiable by lining material to be better adaptable to surgical wound changes during healing. The definitive obturator is fabricated when soft tissues healing completely, approximately three to four months after surgery.^{3,4}

In large defects, obturator needs to extend vertically and horizontally to engage the surgical defect, therefore the size and weight of the obturator will increase. The unfavorable weight of the prosthesis is a problem for definitive obturators, as it compromises the retention, stability, and support. Hollow bulb obturators are designed to minimize the weight of the prosthesis.¹ This case report describes a prosthodontic rehabilitation of patient with nasomaxillary defect using a surgical obturator, followed by definitive hollow bulb obturator and immediate lower denture.

Case Report

A 70-years-old female patient came to the Department of Prosthodontics RSUP Dr. Sardjito Yogyakarta on February 2022 referred by the ENT clinic with diagnosed Sinonasal Cyst on the right maxillary palatal region. Extraoral examination revealed asymmetrical face due to the extensive swelling of the right buccal region with absent pain [figure 1](#). On intraoral examination, showed a large firm mass extending from right palate to the midline suppressing teeth 16;15; radix 21,22,26; and several teeth are missing [figure 2A](#) and [figure 2B](#). Surgical resection by the ENT doctors and restoration of the defect with surgical obturator by prosthodontist was planned.

Presurgical impression of the maxilla and mandible was made using a perforated stock tray and irreversible hydrocolloid impression material. Diagnostic casts were prepared, and the area to be resected was modified on the duplicate cast. The surgical obturator was fabricated with the modified duplicate cast using thermoforming foils material with perforation on the palate and buccal flange area for fixation.

Surgical procedure was performed and the remaining teeth on the maxilla was extracted. The surgical obturator was inserted with two pieces TAD (Temporary Anchorage Device) on the palate as retention devices [figure 3](#).

Three days after surgery, patient was examined if there is

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Figure 1. Extraoral frontal view; Intraoral frontal view; Intraoral Occlusal View

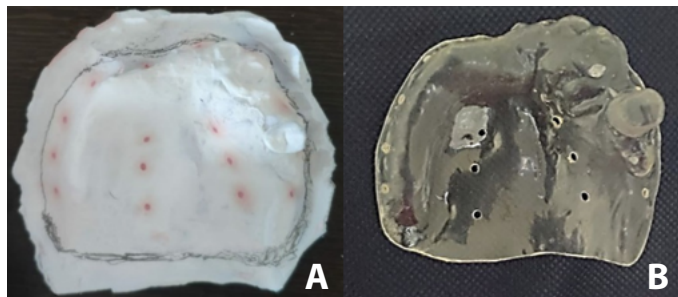


Figure 2. A. Modified Duplicate Cast, B. Surgical Obturator

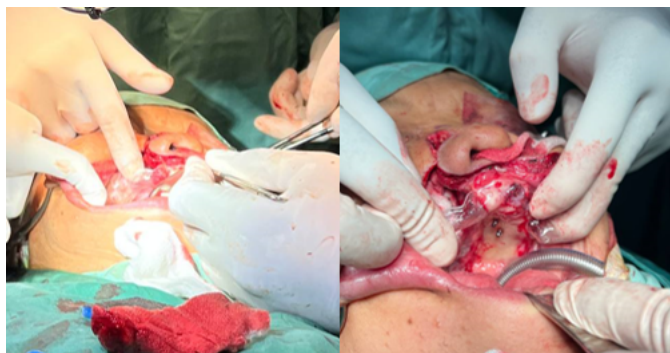


Figure 3. TAD and Surgical Obturator Insertion



Figure 4. 1 week post surgery

any discomfort or pain from the surgical obturator and oral hygiene instructions was given. Regular follow up every week was done to clean the defect area around the surgical obturator [figure 4](#).

After 2 months, intraoral examination showed complete healing of the soft tissues but third grade mobility on tooth 31, 41, 42 was found [figure 5](#). The treatment plan was to make a definitive hollow bulb obturator and immediate partial lower denture on teeth 31, 41, 42.

The TAD and surgical obturator were removed. Then a primary impression with irreversible hydrocolloid impression material was made with the stock tray on both arches. Master cast was obtained using this impression. The design for the definitive obturator was acrylic full denture with close hollow bulb to close the palatal defect, as for the lower denture was acrylic partial denture using a round stainless-steel wrought wire (Diameter 0.7mm) C-clasp on teeth 32 and 37.

Acrylic base plate was made to fit the cast, then tried in intraorally and jaw relation including median line, canine line, and laugh line was recorded on the bite rim. Teeth arrangement followed by try in was done and the denture was packed and processed at the dental labororium.

The finished hollow bulb obturator was inserted and the partial lower denture was inserted immediately after extraction on teeth 31, 41, 42 and post instructions regarding care, hygiene and maintenance were given to the patient [figure 6](#), [figure 7](#) and [figure 8](#). Patient scheduled to control 1 day and 7 day later.

Discussion

Prosthetic rehabilitation of post-maxillectomy patient is frequently a challenging case for prosthodontists. The most common issues are the lack of retention, stability, and support.⁵ In this case, the patient was fully edentulous on the maxilla. TAD (Temporary Anchorage Device) was used as a retention device for the surgical obturator because it can directly insert into the bone through the gingiva with a handheld driver and can be loaded immediately as it gains its anchorage through mechanical gripping of bone instead of osseointegration. TAD is a titanium-alloy mini-screws often used by orthodontist that range from 6-12 mm in length and 1.2-2 mm in diameter.⁶

The main objective of the treatment of maxillectomy defect is to give a prosthetic obturation that recreate an anatomical barrier between oral cavity and sinonasal cavity. Hollow bulb obturator prostheses are widely used alternative to surgical reconstruction because of its simplicity to fabricate and maintain. The hollow bulb makes the prosthesis lighter, have better retention and more comfortable.¹⁷

Due to mobility on tooth 31, 41, 42 an immediate lower denture was planned. Immediate denture is a dental prosthesis that is fabricated to replace the missing teeth and inserted immediately after the extraction of the remaining teeth. Once the healing period has been completed, the immediate denture can be relined to adjust the tissue changes occurring during the healing period.⁸

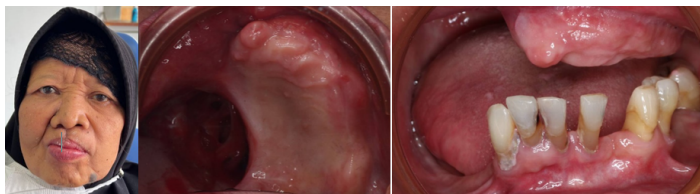


Figure 5. 2 months post surgery



Figure 6. Hollow Bulb Obturator



Figure 7. Hollow Bulb Obturator and Immediate Lower Denture After Insertion



Figure 8. Extraoral view, A. Pre Surgical Treatment, B. Post surgical treatment and prosthetic rehabilitation

Conclusion and Suggestion

First priority of prosthodontist on maxillectomy patient should be to preserve and restore the function of speech and the lost oral structures because of the defect. Treatment planning must be personalized for each patient and special attention must be used when taking impressions and fitting the obturator. Hollow bulb obturator restores the lost hard and soft tissues along with speech, mastication, and esthetics of the patient.

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