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## Case Report

# Delayed surgical obturator as tentative treatment option to close a maxillectomy acquired oronasal communication

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#### ABSTRACT:

Maxillary resection involves complete or partial removal of maxillary bone and associated structures. It results in an opening between the oral and nasal cavity impairing mainly the function of mastication and speech. Dysarthria, dysgeusia, and leaking of nasal secretions into oral cavity are mainly due to non-closure of the defect. Different types of obturators can be designed for such cases depending upon the timing of the surgery. Immediate surgical obturator and the interim obturator are two tentative obturator options that are fabricated after surgical removal. We present a case of an adult male patient who had undergone surgery in the form of maxillectomy on the left side of the face due to squamous cell carcinoma. The patient presented with a Kennedy class 4 modification 1 partial edentulous situation while the defect was that of class IV (Aramany classification). A tentative interim obturator was planned along with a definitive obturator. The interim obturator was in the form of a partial denture and replaced remaining missing teeth. The interim obturator was fabricated in two different steps. In the first step the bulb was made using self-cure resin and in the second step the remaining partial denture was made using heat cure acrylic resin. The interim obturator helped the patient to regain oral function at the end of treatment completion. **Keywords:** oral carcinoma, maxillectomy, obturator, hollow bulb

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#### INTRODUCTION

Surgical removal of facial hard tissue results in deformity that is obvious to a naked eye. Maxillectomy indicates partial or complete removal of the maxillary bone either unilateral or bilateral through surgical resection. <sup>1</sup> Defects in and around the face can be either genetically inherited or can result due to trauma or acquired from ablative tumour removal. <sup>2</sup> Invariably surgical defect results in oral antral/nasal communication which impairs normal functioning of these cavities. <sup>3</sup> The acquired defects after surgical removal of carcinoma are more debilitating and disfiguring due to non-conservative approach in which normal healthy tissue adjacent to the lesion also needs to be removed to avoid recurrence of the carcinoma. <sup>4</sup>

Amongst all oral cancers, one involving oral pharyngeal complex is more common (sixth) and are related to alcohol and tobacco abuse. <sup>5</sup> In the oral cavity, the squamous cell carcinoma (SCC) accounts for major prevalence (90-95%), <sup>6</sup> being distributed mostly in tongue, and affecting aged men (50 years). above). <sup>7,8</sup> In terms of management of the oroantral or

oronasal communication, the prosthesis used to close tentatively for proper function is called as the obturator. The function of the obturator is to seal the opening thereby restoring the normal functioning of the oral and nasal cavity. <sup>9</sup> The two main functions that it facilitates greatly are the mastication, deglutition and the speech. The communication between the two cavities results in hypernasal speech or a nasal twang in the voice which makes the voice inaudible. Obturators are also aimed to perform other functions depending upon the type (immediate, surgical, interim, definitive). <sup>10</sup> With so many variations of defect possible, the devising of classification of defects and obturator designs has eased problems encountered in retention or occlusion. <sup>10</sup>

Many different types of obturators have been mentioned in the literature. Since there are no standard guidelines, the obturator system has numerous variations in terms of material used, design, type, It allows one to explore and every time something new about obturator comes to light. It is because of the multiple possibilities it allows since defects are not same in two individuals. This also explains the difficulty to standardize such prosthesis. Traditionally obturator should be planned before surgery and should be inserted immediately after surgery. However, many cases seek treatment after performing the surgery. The most difficult to fabricate in terms of prosthesis stability and retention are immediate surgical obturator

(7 days' post-surgery) and interim obturators. The reason for their difficulty being the ever changing soft and hard tissue anatomical characteristics due to healing.

This article in the form of a case report presents a case of an interim obturator that was fabricated three weeks after surgery. The obturator to be designed was to be worn temporarily for a period of 4 to 6 months after which a definitive obturator had to be designed.

#### CASE REPORT

An elderly adult male patient aged 54 years referred to the prosthodontic department with chief complaint of opening in the palate with a continuous discharge of nasal secretions in the oral cavity. The patient reported that he developed a swelling in the left cheek region that was diagnosed later to be a squamous cell carcinoma. The patient was reported to undergo surgery at a medical hospital, and no dentist or prosthodontist was consulted before surgery. The patient was also supposed to undergo radiotherapy after surgery. Patients other related past history were non-significant except that he used to consume tobacco and alcohol regularly which he had left. Extra oral examination showed a collapsed left cheek with drooping lips on the same side. Intra oral examination revealed partially edentulous maxillary arch (Kennedy class 4 modification 1) with Aramany class 4 maxillary defects (Fig 1A). The remaining natural teeth had generalized gingival recession and a large defect measuring more than 3 cm square (Fig 1B) was seen in the left maxilla. Treatment plan presented to the patient was a definitive obturator that could not be fabricated at present but after 6 months following surgery. Tentatively, he was offered the treatment with an interim maxillary hollow bulb obturator till definitive prosthesis would start. The hollow bulb obturator was anticipated to reduce the weight of the prosthesis and be friendly to periodontally compromised teeth. The prosthesis would also need less retention due to these parameters.

All clinical procedures were done using standard protocol for patient safety and infection control in a prosthodontic clinical set up as per the recent guidelines. <sup>11,12</sup> The diagnostic impression was made by first blocking out the defect in a gauze piece tied to a sterile suture thread. The impressions were made using irreversible hydrocolloid followed by pouring of diagnostic casts which were duplicated using agar

agar. A special tray was made over the cast with a two mm block out and spacer provided with modelling wax. The final impressions of the defect were made by first moulding the borders using green stick impression compound. The tray adhesive was applied to the custom tray followed by final impressions with elastomeric impression material. In the laboratory standard protocol for infection was followed. <sup>11,12</sup>



Figure 1: (A) Intra oral view of the existing occlusion (B) Oro antral communication (C) Dewaxed flask (D) Invested and dewaxed cast (E) Lining with spacer after placing self-cure resin underneath (F) Interim obturator tissue surface (G) Obturator in flask



Figure 2: (A) Obturator after hollowing (B) Interim prosthesis frontal view (C) Interim prosthesis superior view (D) Interim prosthesis in centric occlusion (E) Palatal view of the interim prosthesis with clasps engaging natural teeth

The master cast was prepared and base plate and occlusal rims were fabricated following which clinical step of jaw relations was done. The teeth arrangement followed the clinical step which was followed by the trial of the teeth arrangement. The laboratory procedure of hollowing out the bulb of the obturator was done during flasking and dewaxing. Once dewaxing was done (Fig 1C, D), the hollowing of the obturator was performed using a single step self-cure resin method (Fig 1 E, F, G). The final laboratory step included packing the heat cure acrylic resin layer on the other side (Fig 2 A) which was followed by acrylic processing using the long duration method. The denture was retrieved, finished and polished (Fig 2 B, C) using routine laboratory equipment and procedures. The final hollow bulb obturator was inserted in the patient and tested for

simultaneous and even contacts (Fig 2 D, E). All clasps were passive and became active only if the interim obturator would move away from the basal seat. The patient was instructed for maintaining the hygiene and was also educated about how to use the interim obturator. The patient was put on a follow up and was asked to report if any complication would occur. The patient was also asked to report for a definitive prosthesis after a period of 4 months. The patient was extremely satisfied with the outcome of the interim obturator.

#### DISCUSSION

A clinical case of planning a tentative and definitive treatment plan for acquired maxillectomy defect has been presented. The unique aspect of this report is the treatment planning for both tentative and definitive treatments. The tentative treatment was in the form of an interim partial denture obturator retained by natural teeth while the definitive treatment plan consisted of a cast partial denture with the obturator. The definitive treatment plan of the same case will be presented after completing the case. Oro nasal communication can be present either at birth (cleft palate) or can be acquired as a result of disease or correction of disease like carcinoma. Most common acquired are those that result due to surgical removal of oral carcinoma, <sup>13</sup> while less common or rare conditions like Aspergillus have also been reported. <sup>14</sup> Numerous techniques that involve the different use of materials and methods for obturator bulb hollowing have been presented in the literature. <sup>15</sup> The materials used for hollowing the obturator bulb include wax, sugar, acrylic resin shim, polyurethane foam, plaster, cellophane, asbestos, elastomeric impression (light body with gauze), thermocol, dental stone, clay dough, salt, gelatin soap and alum. 16 Hollowing a prosthesis has been done for different purposes in dentistry. The denture can also be hollowed to accommodate a salivary reservoir for patients who have xerostomia and feel problems due to it like dysphagia or dysgeusia. <sup>17</sup> While a lot of focus in such cases has been on the techniques or the materials, this case will focus on the treatment aspects of such cases. Major problem for such patient includes deglutition and speech. During the initial phase of deglutition, once the mastication process is completed, the tongue presses the chewed food against the hard palate and with peristaltic movement forces the food to the pharyngeal cavity to be swallowed. In presence of communication of the size that was present in this case, most of the chewed food used to enter the nasal cavity and after gravitational effect used to fall down in the oral cavity along with nasal secretions. The patient during the course of his history taking revealed that initially he used to feel a vomiting sensation the moment he realized that his food contains nasal secretions.

The removal of maxilla alters speech through many different ways which are merely not only related to

the presence of nasal communication. While the effect on resonance has been thoroughly covered in the literature, the natural loss of effect of antrum and its effect on speech has been neglected. The largest nasal sinus plays a major role in keeping the nasal mucosa moist. The patient reported that his nasal cavity felt more dry after surgery. The maxillary sinus is also closest to oral cavity due to which its removal is inevitable in case of oral cancer. 18 Dysarthria is a common problem associated with maxillectomy and the presence of oro antral communication. <sup>19,20</sup> The interim obturator is fabricated at a time when the patient starts feeling the significance of his tissue loss. The obturator covers the defect and restores function. It allows the patient to adapt and learn how to function in the presence of the deformity. The interim obturator should be light weight to allow patients to adapt fast. Problems in retention and stability of the obturator can render a patient to experience added difficulties to the existing ones. A modified treatment partial denture in this case was the ideal choice since it allowed incorporation of wrought wire clasps, smooth palatal surface, removal of excessive weight and relining in future. The limitation of such dentures is the movements that are a part of healing changes underneath. Most of the soft and hard tissue changes take place during the first few weeks after surgery. Bone resorption is rapid initially which leads to changes in the underlying foundation. These changes need to be accommodated as and when required by the patient. Depending upon the extent of the defect, the patient may or may not be able to perform mastication. Since one of the side is missing, the interim obturator moves more than what is desired. With proper patient education and modification in diet, one can overcome these difficulties which are not improbable. Improving the patient's selfconfidence should be an essential component of the treatment plan. A well-functioning obturator allows patients to improve his communication with others (friends, family and relatives). <sup>21</sup> Speech is also enhanced if the prosthesis form, colour and texture are discernible by the available tongue and surrounding mucosa. This is essential to any prosthesis be it intra oral or extra oral. 22

#### CONCLUSION

Obturator that is hollowed using any technique or material can enhance the patient's adaptability to his disfigurement. All obturators should be designed before surgery. General surgeons should consult a prosthodontist before performing resection surgeries for oral cancer.

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#### **CONFLICT OF INTEREST**

None

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