

Patient Rehabilitation with Prosthetic' Obturator Mystery

Running Title: Large Post-Surgical Palatal Defect Compensation

Reem Hekmat Al-Bakri^{1*}, Fatima Ahmad Mohammad², Rawaa Younus Al-Rawee³

¹Reem Hekmat Al-Bakri

Job Title: Specialist in Prosthodontic Replacement Unit at Maxillo Facial Surgery

Degree: BDS., Higher Diploma in Prosthetic dentistry.

Position: Department of Oral and Maxillofacial Surgery.

Institution: Al-Salam Teaching Hospital. Mosul, Iraq

Academic Affiliation: Ministry of Health Iraq. (Higher Diploma in Prosthetic dentistry)

Address: Al-Zeraiy city. Mosul. Nenavah, Iraq. Phone No: 009647704478136; Email: albakr382@gmail.com

²Fatima Ahmad Mohammad

Job Title: Specialist in Prosthodontic Replacement Unit at Maxillo Facial Surgery

Degree: BDS., M Sc Prevention Dentistry

Position: Department of Oral and Maxillofacial Surgery.

Institution: Al-Salam Teaching Hospital. Mosul, Iraq. Phone: 00964 7709930564; E-mail: fa19762000@yahoo.com

³Rawaa Younus Al-Rawee

Job Title: Senior Specialist in Maxillo Facial Surgery

Degree: BDS., M Sc OS., MOMS MFDSRCPS Glasgow., Ph.D. MaxFacs.

Position: Department of Oral and Maxillofacial Surgery.

Institution: Al-Salam Teaching Hospital. Mosul, Iraq

Address: Al-Sukar city. Mosul. Nenavah, Iraq. Phone No: 009647726438648; Email: dr.rawarawi@yahoo.com

Zip Title: Iraq / Nineveh / Mosul / Al-Zuhoor, Zip Code: 41003

***Corresponding author:** Specialist in Prosthodontic Replacement Unit at Maxillo Facial Surgery, Al-Zeraiy city. Mosul. Nenavah, Iraq. Phone No: 009647704478136; Email: albakr382@gmail.com

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Abstract

Introduction: Obturator prostheses are used to efface openings and holes in the palate, which are related to the presence of a communication between the oral cavity and the nasal or sinuses cavity. The use of obturator prosthesis is indicated for both dentate mouths and for partially or totally edentulous mouths.

Case Presentation: A 55 years old female patient was complaining from lack of retention, poor esthetic and difficulty in eating and speech with her old obturator. The main complaint was nasal regurgitation of food and liquid. Intra-oral examination showed sectioned hard palate, alveolar bone, teeth and soft tissue that cross the midline. A hollow bulb obturator was fabricated for the patient mentioned in this case report. A hollow bulb obturator was chosen in order to reduce the bulk of the prosthesis which in turn made it light weight and more comfortable for the patient. Consequently, primary impression of the maxillary arch was made using irreversible hydrocolloid. The final impression was taken using light body silicon impression material in order to obtain the final cast. Then maxillo-mandibular relation record includes recording vertical dimension and centric relation as conventional way. The final denture was fabricated from hot cure acrylic resin. Followed by flasking, deflasking, finishing and polishing, the obturator inserted in patients mouth. The prosthesis rehabilitated the patient in terms of function, phonetics and also improved the esthetics of the patient. The use of a hollow bulb design improved the comfort of the patient by decreasing the weight of the prosthesis.

Discussion: A hollow bulb design for the obturator was chosen in order to reduce the bulk of the prosthesis which in turn made it light weight and more comfortable for the patient. The hollow bulb further added resonance, thus improving the clarity of the speech.

Conclusion: The use of a hollow bulb design improved the comfort of the patient by decreasing the weight of the prosthesis

Keywords: Hollow Bulb Obturator. Prosthetic' Rehabilitation. Large Palatal Defect. Surgical Excision Compensation

Introduction

Partial maxillectomy is a radical surgical technique recommended for the treatment of large benign or malignant lesions requiring an extensive safety margin, in their treatment. The surgery can lead to major difficulties in the reconstruction and the rehabilitation. Surgical maxillectomy generally determine oro-antral communication, in a greater or lesser degree, depending on the extension of the removed area. The size of the communication is related to the risk of malnutrition and weight loss [1].

Obturator prostheses are used to efface openings and holes in the palate, which are related to the presence of a communication between the oral cavity and the nasal or sinus cavity. The use of obturator prosthesis is indicated for both dentate mouths and for partially or totally edentulous mouths [2].

Several problems can arise from direct communication between the oral cavity and the nasal or sinus cavity. These difficulties are related to the speech, swallowing, ingestion of liquids, solids and chewing, all of them due to the loss of teeth or bone tissue during surgery [3]. Similar negative psychological impact on patient's behavior is another issue that we cannot forget [4].

Care of these patients requires a multi-disciplinary approach to help them on their aesthetic and functional adaptation [5].

Clinical Importance are:

- A Prosthodontics' rehabilitation for a patient with hemi-maxillectomy has great role in concomitant with maxillofacial surgery.

- The light weight of the hollow bulb obturator makes the prosthesis more comfortable to the patient.
- Care of hemi-maxillectomy patients requires a multi-disciplinary approach to help them on their aesthetic and functional adaptation

In this case report presentation, we discuss closure of huge postsurgical palatal defect with a prosthetic obturator end with changing patient psychology and functions.

Case presentation

A 55 years old female patient reported to the department of maxillofacial surgery department -prosthetic replacement unit at Al-Salam Teaching Hospital / Mosul. The patient major complaints were lack of retention in her previously fabricated prosthesis, poor esthetic and difficulty in eating and speech. The main complaint was nasal regurgitation of food and liquid.

The patient had undergone bilateral sub-total maxillectomy with resection of most of the maxillary structures, only a portion of the maxillary tuberosity remained, no any graft for the defect has been applied. Intra-oral examination showed resected hard palate, alveolar bone, teeth and soft tissue that exceed the midline (Figure1). As the defect involved the whole palatal area, under cut in this site was very limited making adequate retention very difficult. All treatment modalities are discussed for the patient and her family involving dental implant supported prosthesis. The patient did not accept an implant supported prosthesis because of her low socio-economic status so a hollow bulb obturator was suggested to solve the problem. Decision for acrylic prosthesis fabrication is made.



Figure 1: Intra-oral photograph showing the defect area.

Figure Legend

Figure Number	Figure Title
Figure 1	Intra-oral photograph showing the defect
Figure 2	primary impression with alginata
Figure3	Border molding
Figure 4	final cast
Figure 5	Recording occlusal relation
Figure 6	Try in visit
Figure 7	Try in in patient mouth
Figure 8	Insertion of final prosthesis

Procedure

A perforated custom metallic tray was selected for making the preliminary impression. Primary impression of the maxillary arch was made using irreversible hydrocolloid, after blocking the defect area using wet cotton (Figure 2) and the mandibular arch was recorded

using irreversible hydrocolloid also. The primary casts were obtained from the impression. Necessary mouth preparation was performed on the patient before making secondary impression. Special cold cure acrylic resin tray on the primary cast was fabricated using auto polymerizing acrylic resin.



Figure 2: primary impression with alginata.

Border molding was done to record the functional depth and width of the labial and buccal soft tissues, surrounding the defect (Figure 3).



Figure 3: Border molding.

The final impression was taken using light body silicon impression material in order to obtain the final cast (Figure 4). The master cast was poured in type IV stone. The block out of the master cast was done using wax. This

would provide sufficient thickness of the acrylic material for the strength of the obturator and would make the mold space for construction of the prosthesis.



Figure 4: final stone cast.

Then maxillo-mandibular relation record includes recording vertical dimension and centric relation as conventional way (Figure 5).



Figure 5: Recording occlusal relation.

After that the try in visit with the teeth in wax were tried inside the patient's mouth to confirm maxillo-mandibular relation, as well as verifying the appearance (Figure 6 and 7).



Figure 6: Try in visit.



Figure 7: Try in in patient mouth.

The final denture then was fabricated from heat cure acrylic resin (Vertex, Netherland). Followed by flasking, deflasking, finishing and polishing. After that insertion in patient's mouth (Figure 8).



Figure 8: Insertion of final prosthesis.

Discussion

In the case described in the present study, the patient suffered from very bad psychological condition associated with significant functional and aesthetic problems following maxillectomy.

The majority of maxillary defects can be rehabilitated with conventional simple obturator prosthesis. However, inadequate retention, stability and support may be associated with the use of an obturator (6). Basically, prosthetic reconstructions have to satisfy three major aspects:

- Health of the remaining tissues
 - Esthetics and function
 - Retention and stability of the prosthesis.
1. Health of the remaining tissues: It is obvious that maintaining health for the remaining tissues must be the primary goal of the therapist. It is the prosthodontist's responsibility to incorporate the prosthesis on to healthy abutments and healthy tissues. Before starting with the fabrication of the definite prosthesis, it is mandatory that the remaining soft and hard tissues must be free of infection, caries, calculus etc.

2. Esthetics and function: It is very difficult to meet the esthetic requirements since esthetic demands may vary greatly from one person to another. When the final prosthesis was given to the patient, her speech, mastication, deglutition, facial profile were found to be improved. LaDeane Fattore and Louis Fine suggested a method for fabrication of a light weight hollow denture that can be used for patients with advanced atrophy of the maxillae (7).

A hollow bulb obturator was fabricated for the patient mentioned in this case report. A hollow bulb design for the obturator was chosen in order to reduce the bulk of the prosthesis which in turn made it light weight and more comfortable for the patient. The hollow bulb further added resonance, thus improving the clarity of the speech [8].

Prosthodontics rehabilitation for patient with hemi-maxillectomy has great role in concomitant with maxillofacial surgery. In this report the technique was used two parts, hollow obturator and the acrylic denture.

The hollow obturator made of bioplast flexible materials (polycarbonate) type which is a biocompatible material. Represented the inner part of the prostheses that engages the maxillary defect undercuts because of the flexibility of the material which is aid in retention. The light weight of the flexible material made the prostheses more

comfortable to the patient. The problem of accurate fit to improve retention had been studied by Patil and Patil in (2012, 2017) they use a pre-shaped wax-bolus to maintain a predictable internal dimension of a hollow space during flasking procedure [9].

Different materials, such as sugar, salt and ice, can be incorporated into the resin during the packing stage to produce a hollow bulb obturator, although the simplest method is to grind out the interior of the obturator bulb after acrylisation. Once the obturator is hollow, a lid can be secured to the obturator to convert an open bulb into a closed one. Different techniques have been advocated for making hollow bulb obturator. Oh, and Roumanas suggested a double processing technique to optimize the thickness of the bulb. Habib and Driscoll suggested a method whereby a part of the bulb similar to a lid is removed and then joined back to the prosthesis after the bulb has been hollowed (10).

Conclusion

The present case report showed the prosthetic rehabilitation of a partial maxillectomy patient using a hollow bulb definitive obturator. It involved the fabrication of a partial denture onto which a hollow bulb prosthesis was made. The prosthesis rehabilitated the patient in terms of function by providing better masticatory efficiency, phonetics by adding resonance to the voice hence improving the clarity of speech and also improved the esthetics of the patient. The use of a hollow bulb design improved the comfort of the patient by decreasing the weight of the prosthesis.

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Conflict of Interest

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To the hidden laboratory man how fabricate the prosthesis

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