

The surgical and definitive obturator after hemimaxillectomy of the palate

¹Yusalvi Rifai, ¹Riezky Rhamdani, ²Acing Habibie Mude

¹Postgraduate Student of Prosthodontist Specialist Program

²Department of Prosthodontics

Faculty of Dentistry, Hasanuddin University

Makassar, Indonesia

Corresponding author: Yusalvi Rifai, e-mail: yusalvirivai615771@gmail.com

ABSTRACT

To describe the use of surgical obturators and definitive obturators in post-hemimaxillectomy. Palatal tumour patients who have undergone hemimaxillectomy surgical came to the Department of Prosthodontics for the examination. Clinical examination revealed a large lesion on the left palate and involved his teeth. Two types of obturators were made, they were surgical and definitive obturators. Obturator has been used for four months and was helpful in restoring swallowing, mastication, speech, and aesthetic functions. It is concluded that the use of an obturator can help patients in swallowing, masticating, and speaking, as well as helping to restore aesthetic function.

Keywords: definitive obturator, hemimaxillectomy, palatal tumor, surgical obturator.

INTRODUCTION

One of the cancer treatments in the oral cavity is a surgical process to remove lesions in the tissue. This removal is performed partially or completely on a jaw.¹ The surgery can involve both soft and hard tissue.² Removal of this tissue will result in a defect that will affect the integrity of the oral cavity. In addition, these defects can also affect aesthetic and another function.¹ Aesthetic disorders can significantly affect the patient's psychological and social condition.³ Various functions that experience these disorders can be treated with obturators. An obturator is a device that can help to support soft tissue after surgery. In addition, the obturator can improve the patient's psychological condition, which can make the patient more confident. The obturator also has artificial teeth that can replace the function of teeth that have been lost due to removal of tumor lesions. These functions include speech, mastication, aesthetic, and psychological functions.¹

The obturator is created to maintain the lining between the nasopharynx and oropharynx. This is done so that the food eaten does not enter the respiratory tract. In addition, the use of an obturator in this condition can also provide sufficient pressure in the oral cavity to facilitate swallowing.³ The use of surgical obturators is divided into some types based on the time of use, namely immediate, delayed, interim, and definitive. An immediate surgical obturator is placed immediately after surgery or removal of a tumor mass. Delayed surgical obturators are placed 7-10 days after surgery. Interim surgical obturator is placed 4-6 weeks after surgery. Definitive surgical obturators are placed 4-6 months after surgery.⁴ In this case report, we will discuss the two types of obturators, they are immediate surgical obturators and definitive surgical obturators.

CASE

A 53-year-old female patient came to the Dental

Hospital of Hasanuddin University upon a referral from an ENT specialist. The patient was planned to undergo surgical removal of the left upper jaw due to the presence of a tumor. The patient needed a surgical obturator prosthesis after removal of the tumor for her oral cavity. On clinical examination, there was enlargement with hard palpation of the left hard palate with involvement of teeth 21 to 27. In addition, there were caries in 18, 12, 38, 37 and root remnants in 17, 16, 26, 27, and 36 (Fig.1). The patient will undergo hemimaxillectomy surgery in the area. On the panoramic radiograph, a radiopaque mass extends over the right hard palate (Fig.2).



Figure 1 Intra oral photography.



Figure 2 Panoramic radiography.

MANAGEMENT

At the first visit, clinical photographs of the oral cavity were taken. Then an initial impression was

also performed using irreversible hydrocolloid material to obtain a diagnostic model for the maxilla and mandible. After a multidisciplinary discussion was conducted with the ENT specialist to determine the extent of the maxillary retrieval plan. The results of the discussion were then simulated on the study model (Fig.3).



Figure 3 Diagnostic model and simulation of the maxillectomy



Figure 4 The surgical obturator.



Figure 5 Surgical obturator insertion immediately after hemimaxillectomy.

After being simulated in the diagnostic model, a surgical obturator was created for the patient. The surgical obturator was made of heat cured acrylic, accompanied by artificial teeth and clasps. All of the abutment teeth were gripped with the half Jackson type (Fig.4). The clasps were placed on 18, 15, 11, and 28. At the time of insertion, the clasp adaptation of each tooth was checked, as well as the position of the obturator base in contact with the tissue (Fig.5).

After the surgical obturator was inserted, immediately after the surgery was completed, the patient was instructed to come for a follow-up the next day. At this first control, the patient showed vital signs within normal limits. General condition improved. Blood pressure was 120/80 mmHg. The patient was able to sit and walk. In addition, the patient

was able to drink with the obturator attached to the jaw. Obturator was in a good condition; retention, stabilization, and occlusion were also good (Fig.6). The patient did not complain of any disturbances when using the obturator. The patient was then instructed to use the obturator throughout the day, and to remove it at bedtime at night. The obturator also needs to be cleaned by brushing under running water.



Figure 6 The first follow-up, 24 hours after surgery.



Figure 7 Seven days after insertion.



Figure 8 Three months after insertion.

Control was carried out again on the 7th post-insertion day. The patient's clinical condition was getting better. The patient did not complain of interference with the use of the obturator. The patient was able to eat and talk well. The obturator was in a good condition (Fig.7), but it was necessary to reduce the buccal flange to adjust the healing of the soft tissue around the defect. The patient was then instructed to keep cleaning his obturator, and to keep using the obturator for the times described in the first control.

Subsequent control was performed 3 months after insertion. On clinical examination, the visible tissue healing is getting better. There was still hyperemia in the palatal mucosa (Fig.8). The patient has become more comfortable in using the obturator for eating and talking activities. However, a buccal flange still compressed the mucosal area. So, the buccal flange was reduced to adjust to the healing mucosal tissue. Patients were still instructed to use their obturator at predetermined times and to clean the obturator as explained in the previous controls. The patient was then referred to oral surgeon for removal of the remaining roots 17 and 16

in preparation for a definitive obturator.

Subsequent controls were performed 4 months after insertion. At this meeting, the post-extraction sockets 17 and 16 were examined, as well as the surgical healing area that was in contact with the obturator (Fig.9). Then anatomical impression was carried out for the making of an individual impression tray (IIT), border molding and physiological impression were performed (Fig.10).



Figure 9 Anatomical impression, 4 months after surgery.



Figure 10 Individual impression tray after border moulding and secondary impression.



Figure 11 Metal frames try-in.

At the next meeting, a metal frame try-in was performed for a definitive obturator in the maxilla and a removable partial denture for the mandible (Figure 11). The obturator used is a hollow bulb type obturator. One week later, a dental try-in was performed, then at the next meeting a definitive obturator was inserted (Figure 12). Then, definitive obturator control was performed 1 week after insertion.

DISCUSSION

Rehabilitative treatment such as obturators in post-maxillary surgery patients is a challenge for dentists. The determination of the choice of its use must be based on clinical examination, as well as further examination such as radiographs.⁵ In addition, it is necessary to build a discussion with oral surgeons, in order to achieve the best treatment results. The making of this obturator requires the formation of a boundary between the nasal cavity and

the oral cavity. This device must be able to assist in improving oral functions, especially mastication.^{6,7} Loss of some tissue can change the function of surrounding structures, such as speech, breathing, swallowing, and aesthetic disturbances.⁸

The obturator used by the patient must close the surgical defect. This is done for the purpose of mastication and to protect the area of the defect that is undergoing healing, so that it can assist in the healing process. Obturators can also be used to reduce postoperative bleeding, as well as to reconstruct the contours of the palatal area of the defect. This prosthesis also improves speech function, aesthetics, swallowing, and the patient's psychological condition, by increasing their self-confidences.

Obturators have various types based on their shape or use. In a case report made by Vivek et al in 2017, an obturator with a thermoplastic material was used. The patient is a 73-year-old woman who recently underwent a maxillectomy due to necrotizing ulcerative gingivitis.⁹ In 2019, Uma Maheswari also made an obturator for her 64-year-old male patient. The patient had recently undergone maxillectomy surgery. The obturator made is a hollow antral bulb type.¹⁰ This type is similar to the type of obturator used in this case report. Hollow or empty space formed in the obturator in this type is considered to reduce weight and increase the retention of the obturator.¹¹

The choice of the type of obturator can be made based on its stability.¹² Hoshiai uses a movable obturator which consists of a ball attachment on the metal base and a socket on the obturator which acts as a stress reliever. A palatal obturator made of acrylic was made by Eucheol for a patient who recently underwent tumor resection in the area of the nasal cavity involving the hard and soft palate.¹³ According to Lee et al,¹⁴ this type of obturator can help shape the underlying soft tissue. In a case report made by Mamoru,¹⁵ a female patient with diagnosis of squamous cell carcinoma of the maxillary sinus can be rehabilitated with a movable obturator. This patient had recently undergone maxillectomy surgery, and the use of this type of obturator was considered to provide good stability.¹⁵ According to Mohit et al, in order to obtain better retention, and to provide ease of evaluation, the use



Figure 12 Definitive obturator insertion.

of a better obturator was used connected with headgear and face bow as one alternative that can be done.¹⁶

It is concluded that the use of an obturator can assist patient in swallowing, mastication, and speaking, as well as helping restore aesthetic function.

REFERENCES

1. Shambharkar VI, Puri SB, Patil PG. A simple technique to fabricate a surgical obturator restoring the defect in original anatomical form. *J Adv Prosthodont* 2011; 3: 106-9.
2. Patil PG. Surgical obturator duplicating original tissue-form restores esthetics and function in oral cancer. *World J Stomatol*, 2013; 2(4): 97-102.
3. Patil PG. Modified technique to fabricate a hollow light-weight facial prosthesis for lateral midfacial defect: a clinical report. *J Adv Prosthodont* 2010; 2:65-70.
4. Patil PG, Patil SP. Nutrition and cancer. *J Am Dent Assoc* 2012; 143: 106-7.
5. Cain JR. a custom impression tray made with the aid of an existing prosthesis: a clinical technique. *J Prost Dent* 2001;86: 382-5.
6. Cheng AC, Somerville DA, Wee AG. Altered prosthodontic treatment approach for bilateral complete maxillectomy: a clinical report. *J Prosthet Dent* 2004; 92: 120-4.
7. Taira Y, Yanamoto S, Kawasaki G, Yamada S, Atsuta M. Detachable silicon obturator fitted after bilateral maxillectomy. *Int Chin J Dent* 2007; 7: 75-7.
8. Bhandari AJ. Maxillary obturator. *J Dent Allied Sci* 2017; 6: 78-83.
9. Vivek RV. Novel approach to maxillary reconstruction using osteocutaneous free tissue transfer with a customized stent. *Head and Neck* 2017; 1-6.
10. Uma MM, Kasim M, Arjun KK, Athiban I. A modified technique to fabricate a complete hollow obturator for bilateral maxillectomy in a patient with mucormycosis – a technical case report. *Spec Care Dent* 2019; 1-7.
11. Keyf F. Obturator prostheses for hemimaxillectomy patients. *J Oral Rehabil* 2001; 28: 821-9.
12. Hoshiai T, Iida T, Taniguchi H. Vibratory properties of maxillary dentition in maxillectomy patients wearing metal framework obturator prostheses with three different metal materials. *J Prosthet Res* 2011; 55: 252-61.
13. Euicheol CJ, Young HJ, Jin YS. Use of postoperative palatal obturator after total palatal reconstruction with radial forearm fasciocutaneous free flap. *J Cranio Surg* 2015; 26(5): 383-5.
14. Lee MC, Lee DW, Rah DK. Reconstruction of a total soft palatal defect using a folded radial forearm free flap and palmaris longus tendon sling. *Arch Plast Surg* 2012; 39: 25-30.
15. Mamoru M. Fabrication of a movable obturator following maxillary reconstruction with slit-shaped fenestration. *J Prosthodont* 2015; 254-9.
16. Mohit D, Shastry T, Bhandari S, Singh S, Verma S. A custom made extraoral aid for retaining interim obturator in edentulous patients with bilateral maxillectomy: a report of four patients. *Spec Care Dentist* 2019; 39: 429-34.