

Review Article

Maxillary Obturator-A review

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Received: 14 November, 2021

Accepted: 17 December, 2021

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This article may be cited as: Gupta R, Sharma S, Vashisht D, Kumari M, Vignesh A. Maxillary Obturator-A review. Int J Res Health Allied Sci 2022; 8(1): 104-109.

INTRODUCTION

Most common intraoral defects in the maxilla are in the form of an opening into the antrum and nasopharynx. Maxillary defects can be congenital, developmental, acquired, traumatic, or surgical involving the oral cavity and related anatomic ¹As the patients quality of life is altered; social integration becomes difficult and the expectation to return to "normalcy" collapses ²

Defects can cause disruption of articulation and airflow during speech production and nasal reflux during deglutition. Nasal sounds such as "n," "m," and "ng" are seen due to the absence of closure of the pharyngeal wall. Patients after surgical resection have

altered anatomy due to scarring, tissue contracture, lack of bony support, and tissue edema. Surgical resection can lead to the restricted opening of the jaws and altered range of mandibular movements with fibrosis and trismus. These patients have the problem of regurgitation of water and food through nose. There may be difficulty in speech, deglutition, maintaining oral hygiene, and prosthetic treatment ¹

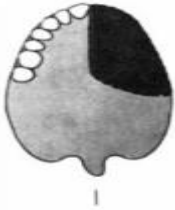




Most patients with acquired maxillary surgical defects can be restored to close to normal function and appearance, definitive prosthodontic treatment will restore the patient to a normal or near normal level of function. ³


DEFINITIONS




Obturator	a maxillofacial prosthesis used to close a congenital or acquired tissue opening, primarily of the hard palate and/or contiguous alveolar/soft tissue structures (GPT-7);
Surgical obturator	Temporary maxillofacial prosthesis inserted during or immediately following surgical or traumatic loss of a portion or all of one or both maxillae and contiguous alveolar structures (i.e., gingival tissue, teeth)
Definitive obturator	A maxillofacial prosthesis that replaces a portion or all of one or both maxillae and associated anatomy as a result of surgery or trauma
Interim obturator	A maxillofacial prosthesis, which is made following completion of initial healing from the surgical resection of a portion or all of one or both maxillae;
Obturator prosthesis modification	Revision or alteration of an existing obturator (surgical, interim, or definitive); possible revisions include the relief of the denture base to alleviate tissue compression and for the augmentation of the seal or border regions to affect adequate sealing or separation between the nasal and oral cavities ⁴

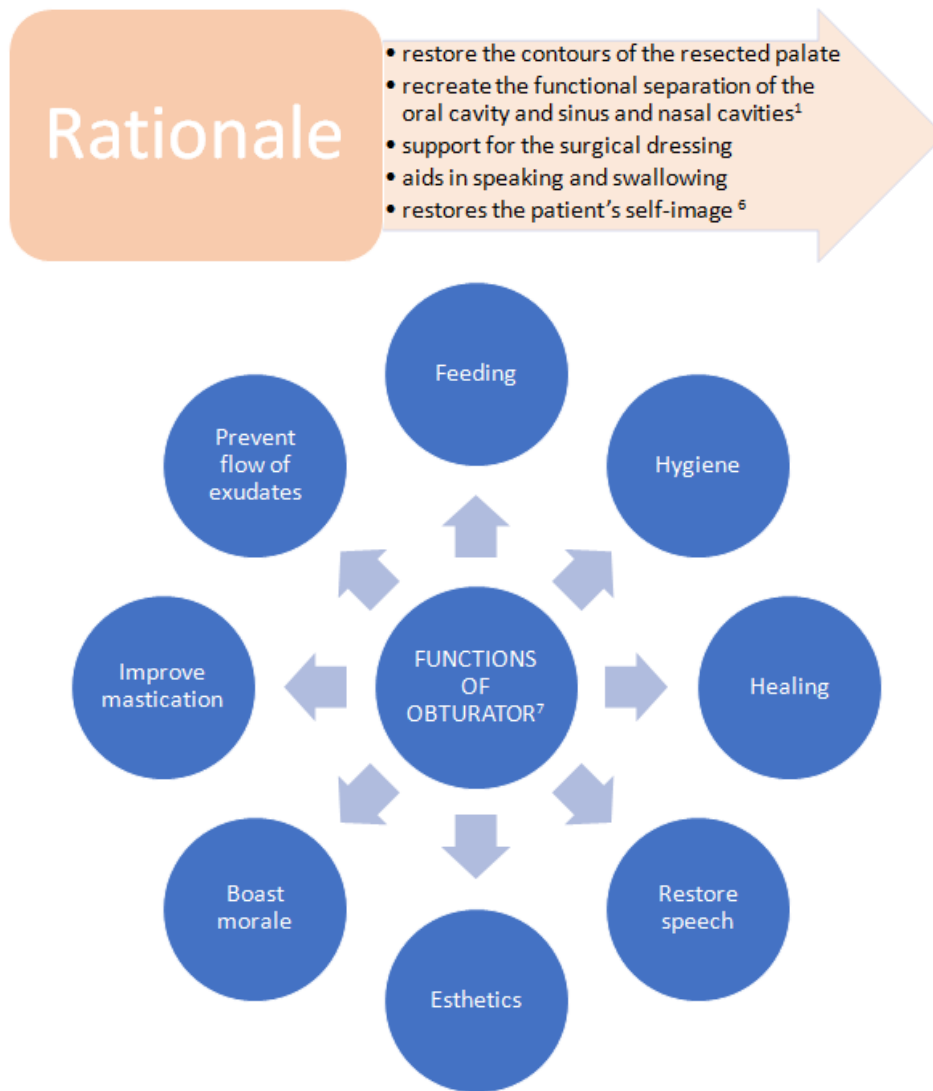
CLASSIFICATION

According to origin of the discrepancy	
For congenital defect	For acquired defect
i. To close the opening of hard palate, a simple base plate type of palatal plate helps to correct the swallowing, feeding, and speech ii. An obturator with a tail, consisting of speech appliance or speech aid prosthesis, which restores soft and hard palate defects and a velopharyngeal extensions that correct the speech iii. An overlay denture or a superimposed denture. ¹	i. Immediate temporary obturator or surgical obturator is a base plate type of prosthesis which is constructed from the preoperative active impression cast and inserted at the time of surgery, i.e. resection of the maxilla in the operating room ii. Interim obturator, temporary obturator, treatment obturator, or transitional obturator is constructed from the postsurgical master cast iii. Permanent obturator or definitive obturator ¹

Armany classification		
Class I	The resection in this group is performed along the midline of the maxilla; the teeth are maintained on one side of the arch.	
Class II	The defect in this group is unilateral, retaining the anterior teeth on the contralateral side	
Class III	The palatal defect occurs in the central portion of the hard palate and may involve part of the soft palate	
Class IV	The defect crosses the midline and involves both sides of the maxillae.	
Class V	The surgical defect in this situation is bilateral and lies posterior to the remaining abutment teeth	

Class VI	It is rare to have an acquired maxillary defect anterior to the remaining abutment teeth ⁵	
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Obturers for Defects involving	
Hard Palate	Soft Palate
<p data-bbox="295 495 831 555">They can be surgical, interim or definitive. These can be for either edentulous or dentulous patients.</p> <div data-bbox="327 571 799 929" style="text-align: center;">  </div> <p data-bbox="422 936 703 965" style="text-align: center;">Figure 1 surgical obturator</p> <div data-bbox="311 992 815 1368" style="text-align: center;">  </div> <p data-bbox="422 1375 703 1404" style="text-align: center;">Figure 2 interim obturator</p> <div data-bbox="368 1440 759 1787" style="text-align: center;">  </div> <p data-bbox="422 1794 703 1823" style="text-align: center;">Figure 3 definitive obturator</p>	<p data-bbox="874 495 1385 555">Speech Aid Prosthesis / Pharyngeal Obturator / Speech Bulb Prosthesis</p> <p data-bbox="874 555 1401 705"><i>Palatopharyngeal insufficiency is a condition where there is lack of effective closure between the soft palate and one or more of the pharyngeal walls during swallowing or speech sounds that require high intraoral pressure</i></p> <p data-bbox="874 705 1401 1003">It is a congenital or acquired anatomical defect of the soft palate that makes the palatopharyngeal sphincter incomplete. Speech bulb prosthesis is an ideal choice for these defects. It is a removable prosthesis to restore an acquired or congenital defect of the soft palate with a portion extending into the pharynx to separate the oropharynx and nasopharynx during phonation and deglutition, thereby completing the palatopharyngeal sphincter</p> <p data-bbox="874 1010 1401 1227">Meatus Obturator:- It only provides static obturation and is not dependent on surrounding muscle activity to provide physiologic separation between the oral and nasal structures. It is not located in a region of muscle activity; therefore is not effective in refinement of speech, as seen with the pharyngeal obturators</p> <p data-bbox="874 1234 1401 1317">Palatal Lift Prosthesis:- The palatal lift prosthesis (PLP) is used to improve soft palate dysfunction. ²</p>



Stages of maxillofacial prosthetic treatment of the patient undergoing maxillary resection

Surgical	Interim	Definitive
A surgical obturator is fabricated, lasts from the time of surgery until the prosthesis and surgical packing are removed 5 to 10 days later ⁸	Approximately 5 to 10 days after the maxillectomy procedure, the surgical obturator is removed along with the surgical packing. Follow up:- <ul style="list-style-type: none"> • following week to reinforce hygiene and adjust the prosthesis as needed every 2 weeks for adjustment⁸ 	After the interim obturator has been worn for 6-12 weeks the definitive obturator is fabricated ² Follow up next day for adjustment as needed once a week thereafter until the patient comfortable every 6 months to once a year to check the fit of the prosthesis and for a thorough soft tissue examination. ⁸

MATERIALS

Choice of materials may be influenced by the following factors:

- ✓ need to engage undercuts,
- ✓ excessive tissue bed mobility,
- ✓ size of the facial defect,
- ✓ and weight of the prosthesis

- ✓ The patient will best be served by making the facial portion of the prosthesis of a lighter, more resilient material than acrylic resin. This approach will require a two-piece prosthesis with the intraoral portion in acrylic resin.
- ✓ Problems that may be encountered with the two piece prosthesis are

- ✓ food impaction in and around the interface and
- ✓ patient difficulty with control and manipulation⁹
- ✓ Heat activated acrylic resin or Co-Cr alloy is used as permanent denture base. Recently, titanium

alloys are also used to reduce the weight of the prosthesis. Partially edentulous arch necessitates the fabrication of cast partial denture.¹⁰

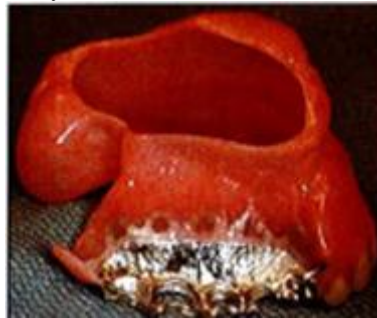


Figure 4 hollow obturator to reduce weight

REHABILITATION

Review of a patient’s medical history is essential in the initiation of treatment. Reduced tissue tolerance following high-dosage radiation therapy plays a distinct role in prosthodontic treatment. Irradiated tissues should be spared undue stress, and in instances of high radiation dosages, prosthetic treatment may be contraindicated.

Early in the treatment, every effort should be made by the physician and dentist to create a more optimistic

outlook for the patient, generating enthusiasm in the treatment and improved patient cooperation¹¹

Every effort should be made to re-establish a favorable distribution of force to achieve stabilization of an obturator prosthesis during mastication and function.¹²

To gain optimum retention, stability, support few maneuvers have been recommended.

RETENTION	
Surgical obturator	Definitive obturator
1. Suture retention, 2. Bone screw retention, Spring retained surgical obturator, and 4. Circumzygomatic wiring for edentulous patients. For partially dentate patients, Inter-dental wiring or suturing can also be attempted. Surgical obturators are modified with liners and tissue conditioners during interim phase. ¹³	Undercuts present in the defected area can serve as a mean of retention Ueda et al. 1999 concluded that the soft silicone materials may be useful in selected edentulous patients with partial maxillectomy defects. Walter et al. 2005 reported that use of wrought wire or cast clasps, indirect retainers (clasps or labial flanges), making a bulb without a top, making a two-part surgical obturator, or use of a sectional obturator with magnets can also aid in retention. Osseointegrated implants may act as a preferable source of retention provided adequate quality and quantity of bone is available ¹³

Support		
Dentulous		Edentulous
Natural teeth in the form of occlusal, cingulum or incisal rests to resist tissue ward movement of the prosthesis or by partial or complete denture overlays ¹⁵	Precision attachments, clasps (with or without rest) implants ¹⁵	The alveolar ridges ✓ the palate ¹⁵

PROGNOSIS

The prognosis of the obturator will improve with:-

- (1) the size (amount remaining after surgery) and curvature of the arch
- (2) the quality of the tissue covering the ridge and lining the defect
- (3) an abutment alignment that is curved instead of linear; and

(4) the availability of teeth on the defect side for support and retention¹⁴

SUMMARY

Patients with such a defect suffer from a lot of psychological trauma due to impaired functions and aesthetics. Hence, we as prosthodontists should try to restore the lost form and function of the oral and peri-

oral structures that will help the patient to live a normal life.¹⁶

Although it is very difficult to improve the quality of life for hemimaxillectomy patients compared to the conventional prosthesis. But this can be achieved with good skill, experience and knowledge of the specialists¹⁷

The obturator decreases the psychological impact of surgery and reassured the patient that rehabilitation procedure has begun. With such management strategy, the major deficiencies/defects addressed promptly. Thus, at initial focus only, improvement in swallowing, speech can be achieved and this helps to boost the rehabilitation process significantly and effectively⁶

Prosthetic rehabilitation will improve patient's social life and restores aesthetics, functions & also boosts patients morale.¹⁶

The maxillofacial prosthodontist should always try to provide the treatment to the fullest of his ability. Sophistication in the prosthetic reconstruction of structural and functional defects improves the final results, if carefully planned, unbiased rehabilitation regimens are established.² Proper interaction between the surgeon and the Prosthodontic fraternity is also mandatory for the successful rehabilitation of the patient both from psychological and functional points of view¹⁰

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