Post-operative Obturator after Maxillectomy: A Systematic Review

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ABSTRACT

This systematic review aims to determine the types of obturators commonly used after maxillary surgery based on several articles from dental journals. A total of 121 articles were obtained in a data search through the PubMed and Wiley databases. Title selection produces 87 articles. Furthermore, the abstract collection was done afterward and provided 19 articles. All of the articles have full text. Five articles were obtained and read carefully to make sure it meets the inclusion criteria. The articles were then analyzed by the two authors. Five case reports were obtained in this review. They discussed five different types of the obturator; they were thermoplastic stent, movable obturator. All of them have their advantages and weaknesses in rehabilitative treatment. Various types of obturator can be used to help in improving speech, swallowing, and aesthetic functions. The choice depends on the case, such as the amount of tissue that is lost and needs to be replaced, as well as the functions required, such as swallowing, mastication, and aesthetics.

Keywords: Hemimaxillectomy, Maxillectomy, Obturator, Post-operative obturator.

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INTRODUCTION

Rehabilitative treatments for a patient after maxillary surgery are challenging for the clinician, which the selection should be based on each case and must benefit the patient.¹ This rehabilitative treatment must recreate the boundary between nasal and oral cavity, to restore and improve the oral function, especially swallowing.^{2,3} The absence of some tissues can alter the function of the remaining structures. The production of speech, nasal reflects, and deglutition can also be disrupted. To overcome this problem, the defects should be restored with a prosthesis called an obturator.⁴

An obturator's functions are to close the defect, for the feeding purpose, and to keep the defective area clean, thus enhancing the healing process. It can also be used as a stent to hold dressings or packs post-surgically, reduce postoperative hemorrhage, and reconstruct the palatal contour. It also improves speech, aesthetics, deglutition, and the more critical it is to benefit the morale of the patient, to increase their confidence.⁴ This systematic review will discuss the various type of obturators for the treatment of the patient after maxillary surgery.

METHODS

This systematic review used PRISMA (preferred reporting items for systematic reviews and meta-analyses) as writing guidelines.⁵ These guidelines used to report an evaluation of some interventions in health issues. It also used PICO to bring the discussion more specific.⁶ PICO stands for population, intervention, control, and outcome. The PICO question for this review is in postoperative maxillary treatment, what type of obturator is commonly used to

support a patient's functional condition. The population and intervention of this review are all the patients with postoperative obturator after maxillary surgery. A comparison of control of this review is the data about the most common type of obturator used and the one that gives the most benefit based on each literature published.

Search Strategy

Data search was performed using the PubMed and Wiley database. The search refers to articles in English as one of the inclusion criteria. This data search was conducted to identify articles published in dental journals in the past five years. Besides, the article must have a focus on obturator postmaxillary surgery. The MeSH keywords used were "palatal obturator" and "post-operative." Search restrictions refer to the English language, publication period, and type of articles published. The examples of articles published include original articles and case reports. A manual search of published articles was done through a database search. One hundred twenty-one articles appear from the use of keywords. Then out of 121 articles, 87 articles were selected through the title. Then the selection continued in the abstract and obtained 19 articles. Then, the selection was carried out on 19 articles, all of which had a full text, which was then analyzed, which finally obtained five articles that could be analyzed based on the specified inclusion criteria. Eligibility Criteria

There are several inclusion criteria for preparing this systematic review. The inclusion criteria are the following:

- The language used in writing the article: English
- the time of publication: last five years

- the focus of the article: the use of various types of obturator after maxillary surgery.
- The kind of article: the form of original articles and case reports.
- The subject of the article: human.

Selection of Study

Keywords are used by the two participating authors (YR and ID) who assist in the article selection process based on the abstract and full-text analysis. Separately, the two authors selected the article based on the specified inclusion criteria. Then, all abstracts and full texts were downloaded and evaluated independently. Eligibility criteria were used to identify articles that will be used for this systematic review. *Extraction of Data*

Data were selected by the two authors (YR and ID) based on year of publication, type of obturator, and successful use of obturator. All of the full text that meets the inclusion criteria were read separately by the two authors and evaluated to formulate this systematic review.

RESULT

One hundred twenty-one references were obtained from database searches, including 27 articles from PubMed and 94 articles from Wiley. Data search from the two databases produced 121 articles, which were the first selected based on the existence of duplications so that 87 titles were obtained. Then the selection was done through an abstract evaluation and got as many as 19 articles. Furthermore, full text was downloaded and evaluated based on inclusion criteria, and the final result was in the form of 5 relevant articles. Below is the flow of the selection of articles in this systematic review. Data were collected from 5 articles in the form of case reports. All case reports were published by four countries, namely the USA, Japan, India, and South Korea. The total number of patients reported were nine patients. Patients' ages vary from 57 years to 73 years. The sex of the patient is dominated by seven male patients and two female patients. Surgical procedures performed also vary, ranging from hemimaxillectomy, total rhinectomy, to radical neck dissection.

DISCUSSION

Vivek reported 2 of his patients who underwent total and partial maxillectomy. The first patient was 73 years old, with a diagnosis of NUG and maxillectomy. The second patient was a 57-year-old male diagnosed with moderately differentiated invasive squamous cell carcinoma with moderate hemimaxillectomy and total rhinectomy. The rehabilitative treatment of these two patients is thermoplastic stent.⁷ Mamoru Murakami treats a 60-yearold female patient with a diagnosis of left maxillary sinus squamous cell carcinoma maxillectomy surgery and radical neck dissection. The rehabilitative treatment is a movable obturator.⁸ The choice of obturator type is based on the stability that is given.⁹ According to him, conventional

obturators inserted in patients previously are unstable and produce nasal regurgitation, and gripping fractures occur. So he decided to make a movable obturator composed of ball attachments on a metal base and a socket on the obturator, acting as a stress breaker. Uma Maheswari made a hollow antral bulb obturator for the patient who underwent maxillectomy and left her right second and third molar teeth behind.¹⁰ This type was chosen because it reduced the weight of the obturator and increased retention.¹¹ Eucheol used acrylic palatal obturator to rehabilitate his patient after tumor resection in the cavity of his right upper nasal cavity, nasopharyngeal, and hard palate and mole.¹² It makes such a type of obturator because it can compensate for hypernasal and nasal regurgitation and provide excellent esthetics and functions. Besides, obturator of this type can form soft tissue contours underneath.¹³ Mohit made headgear face bow assembly type for his patients after hemimaxillectomy treatment for the positive effect in functional, for more natural retention and evaluation, and also the economic benefit for the patients.¹⁴ Based on Rhamdani et al., Stud attachment retained obturator has the best rating in terms of aesthetics, nasal leakage, speech enhancement, and mastication function among conventional, cast partial, hollow bulb, magnet, and implant-supported obturator.¹⁵

CONCLUSION

Various types of obturator can be used to help in improving speech, swallowing, and aesthetic functions. The choice depends on the case, such as the amount of tissue that is lost and needs to be replaced, as well as the functions required, such as swallowing, mastication, and aesthetics.

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Author and year	Country	Number of patients	Age of patient	Type of Obturator	Defects	Diagnosis	Surgery	Expansion of the lesion	Result
			73 y.o. (F);	Thermoplastic stent; ethyl vinyl acetate stent	Maxillary gingivolabial erosive lesion	NUG	Maxillectomy	Gingivolabial sulcus and nasal	Velopharyngeal is less covered, lack of retention because of the inadequate number of teeth support.
Vivek R. Varma (2017)	USA	2	57 y.o. (M)	Thermoplastic stent	Ulceration mucosa & necrotic tissue with progressive osteoradionecrosi s (ORN)	Moderate differentiated squamous cell carcinoma	Total rhinectomy; hemimaxillect omy, upper lip surgery	Right maxillary alveolar to anterior hard palate and midline.	Good enough to reconstruct the defect
Mamoru Murakami (2014)	Kagoshima, Japan	1	60 y.o. (F)	Movable obturator	Left maxillary tumor	Left maxillary sinus squamous cell carcinoma (T3N0M0)	Maxillectomy and radically neck resection	Armani Class I	Stable and provides rehabilitation in mastication, swallowing, and facial esthetics.
Uma Maheswari Mani (2019)	Chennai, India	1	64 y.o. (M)	Hollow antral bulb	Right and left maxillary tumor	Fungal sinusitis	Maxillectomy	All parts of the maxilla except right second and third molar.	Hollow reduces the weight of the obturator and increases retention
Eucheol C Jeong (2015)	Seoul, South Korea	1	67 y.o. (M)	Acrylic palatal obturator	Hard and soft palate tumor	Cancer of nasal cavity, nasopharynx bilateral, hard, and soft palate.	Tumor resection (hemimaxillec tomy)	Nasal cavity, nasofaring bilateral, and left soft and hard palate.	Hypernasal compensation and nasal regurgitation, esthetic, functional, and form the contours of the soft tissue underneath.
Dhiman Mohit et al. (2019)	India	4	>55 y.o.	Headgear Face bow assembly	Maxillary tumor	Maxillary tumor	Hemimaxillec tomy	Hard and soft palate, and alveolar ridge.	It has a positive effect on functional, easy to regulate retention and evaluation, and economic benefit.

 Table 1. Descriptive data from the 5 included studies that reported using obturator after maxillary surgery.