

OPPORTUNITIES FOR TREATMENT WITH AN OPEN OBTURATOR IN PATIENTS WITH RESECTION OF HALF OF THE MAXILLA

Gerdzhikov I.

PhD, Chief Assistant

Department of Prosthetic dentistry, Faculty of Dental Medicine, Medical University of Sofia

<https://doi.org/10.5281/zenodo.10379620>

Abstract

The treatment of patients with maxillary resection is most often carried out with prosthetic methods and means the main purpose of which is the restoration of masticatory and speech function. An important role in the treatment result is played by the correct planning of the type and shape of the prosthetic construction. In cases with large maxillary defects the main problems are related to ensuring the retention and stability of the prosthesis. The research analyses the opportunities for carrying out prosthetic treatment in patients with resection of half of the maxilla with an open obturator. The results showed that the reduced volume and weight of this type of prosthesis provide the necessary retention and stability. Important advantages are also the easy placement in the defect and the shortened period of adaptation.

Keywords: maxillary resection, maxillary defect, maxillary tumor, obturator.

INTRODUCTION

The increased frequency of oncological diseases in the maxillofacial region in recent years is the reason for the increase in the number of patients with maxillary resection [1]. In most cases the created postoperative defects are limited to the midline of the jaw, without affecting the soft palate, with completely or partially preserved teeth on the opposite side [2]. Most often, various prosthetic methods are used for the treatment of these patients, the choice of which depends on the size of the defect and the presence or absence of preserved teeth [3]. The most common problem with prosthetic treatment in such patients is in getting adequate retention, stability, and support [4]. To solve these problems, various means of obturator fixation are used [5].

Regardless of the chosen method, the precise taking of a functional impression of the prosthetic field is decisive for the result of the treatment [6]. The analysis of the working model allows correct planning and construction of the prosthetic construction, according to the characteristics of the specific clinical case [7]. Forming the treatment plan is mainly determined by the size of the defect, with the prevailing opinion being that for large defects, making hollow bulb obturators is more suitable [8].

Various methods for treatment after resection of half of the maxilla have been described in the literature [9, 10]. In some of them, treatment is carried out with open obturators with reduced volume and weight, which provides retention and stability of the prosthesis [11, 12]. Research shows that this type of obturators facilitates placement in the defect and shortens the adaptation period [13]. The main problems are connected

with the shape of the obturator, which makes cleaning difficult and creates a prerequisite for bacterial infection [14]. This is the reason why some authors recommend only the treatment with closed obturators [15, 16].

The purpose of the treatment is to analyse the opportunities for carrying out prosthetic treatment in patients with resection of half of the maxilla with an open obturator.

MATERIALS AND METHODS

For the purpose of the treatment, prosthetic treatment was performed on a 58-year-old patient, operated for maxillary carcinoma. After resection, a left-sided defect was created to the nasal cavity passing along the midline of the jaw and reaching the soft palate [Fig. 1]. In the opposite part of the jaw, the natural teeth from 11 to 17 were preserved as well as the teeth of the mandible. The impressions of both jaws were taken with standard trays and irreversible hydrocolloid impression material, and for the maxilla the defect was previously tamped with gauze. The height of occlusion and the central position of the mandible were determined with record bases with wax rims. After a successful try-in with arranged teeth the denture was finished with heat-curing resin with a low amount of residual monomer. To shape the cup-shaped replacing part of the obturator, preliminary preparation of the plaster model in the area of the defect was made, which limited the free entry of acrylic resin only along the borders of the defect at a depth of 5 mm [Fig. 2 a, b]. The cleaned, polished and disinfected obturator was adjusted in the mouth of the patient [Fig. 3].



Fig. 1. Intraoral view of the patient



a



b

Fig. 2 a, b. The finished obturator with a cup-shaped replacing part

RESULTS

The preliminary set shape of the replacing part of the obturator allows easy adjustment and placing in the defect. The wire hooks used for retention provided the necessary retention and together with the reduced volume and weight improved the stability of the prosthesis. The fixed 5 mm height of the obturator allowed its stable positioning on the floor of the nasal cavity and

provided the necessary sealing which helped to restore speech, eating and fluid intake. The preliminary modelling in the area of the defect allowed non-traumatic transmission of masticatory pressure and prevented the occurrence of decubital injuries. Follow-up examinations showed normal progress of the adaptation period as well as improved self-esteem of the patient.



Fig. 3. The adjusted obturator

DISCUSSIONS

There are different opinions on the type of obturators that should be used for treatment of patients with large maxillary defects. The achieved results confirmed the view that in these cases, prosthetics with open obturators is possible [11, 12]. The successfully carried out treatment showed that reducing the volume and weight of the obturator improves its retention and stability. The views of some authors that hollow bulb obturators should mainly be used in cases with large defects were not confirmed [8]. The achieved results showed that open obturators facilitate placement in the defect and shorten the adaptation period, which is also established by other studies [13]. The main reason for this in the specific clinical case was the predetermined shape of the replacing part of the obturator. The difficult cleaning of this type of obturators can be pointed out as a problem, as reported by other authors [14].

CONCLUSIONS

The use of an open obturator with a cup-shaped replacing part in patients with resection of half of the maxilla allows successful restoration of masticatory and speech function. The reduced volume and weight are the main advantages of the obturator, which facilitate placement in the defect and shorten the adaptation period.

References:

1. Fitzmaurice, C. , Abate, D., Abbasi, N., Abastabar, H. et. al. Global, Regional, and National Cancer Incidence, Mortality, Years of Life Lost, Years Lived With Disability, and DisabilityAdjusted Life-Years for 29 Cancer Groups, 1990 to 2017: A Systematic Analysis for the Global Burden of Disease Study 7. *JAMA Oncol.*, 2019 Dec1;5(12):1749-68.
2. Alqarni H, Alfaifi M, Ahmed WM, Almutairi R, Kattadiyil MT. Classification of maxillectomy in

edentulous arch defects, algorithm, concept, and proposal classifications: A review. *Clin Exp Dent Res*. 2023 Feb;9(1):45-54.

3. Corsalini M, Barile G, Catapano S, Ciocia A, Casorelli A, Siciliani R, Di Venere D, Capodiferro S. Obturator Prosthesis Rehabilitation after Maxillectomy: Functional and

Aesthetical Analysis in 25 Patients. *Int J Environ Res Public Health*. 2021 Nov 28;18(23):12524. 4. Hazra R, Srivastava A, Kumar D. Obturators: A proposed classification and its associated techniques. *J Indian Prosthodont Soc*. 2023 Apr-Jun;23(2):192-197.

5. Ghazy ES, Altonbary GY, Gebreel A, El-Daker MA, Hegazy SA. Evaluation and comparison of retention and patient satisfaction with milled polyetheretherketone versus metal maxillary obturators. *J Prosthet Dent*. 2023 Oct 12:S0022-3913(23)00547-4.

6. Naveau A. Preliminary impression for maxillary defect: A two-step technique. *J Prosthodont*. 2023 Sep 10. doi: 10.1111/jopr.13766.

7. de Groot RJ, Rieger JM, Rosenberg AJWP, Merkx MAW, Speksnijder CM. A pilot study of masticatory function after maxillectomy comparing rehabilitation with an obturator prosthesis and reconstruction with a digitally planned, prefabricated, free, vascularized fibula flap. *J Prosthet Dent*. 2020 Nov;124(5):616-622.

8. Parthasarathy N, Anusha Ks, Madhan Kumar S, Shanmuganathan Natarajan. Maxillary Defect Rehabilitation Using a Hollow Bulb Obturator. *Cureus*. 2022 Nov 10;14(11):e31326

9. Ahmed ZU, Flynn J, Riedel ER, Huryn JM, Rosen EB. Definitive maxillary obturator prosthesis:

Timelines for fabrication and follow-up. *Spec Care Dentist*. 2020 May;40(3):315319.

10. Ogami K, Hagio M, Ueda T. Maxillary Obturator Prosthesis Made with Polyetherketoneketone Using Optical Impression and CAD/CAM System. *Bull Tokyo Dent Coll*. 2023 Mar 7;64(1):31-37.

11. Kulkarni, P., Kulkarni, R., Shah, R., Maru, K. Prosthetic Rehabilitation of a Partially Edentulous Patient With Maxillary Acquired Defect by a Two-Piece Hollow Bulb Obturator (Using a Dentogenic Concept). *J Coll Physicians Surg Pak*. 2017 Aug;27(8):514-516.

12. Oh WS, Roumanas ED. Optimization of maxillary obturator thickness using a doubleprocessing technique. *J Prosthodont*. 2008 Jan;17(1):60-3.

13. Mani, U., Mohamed, K., Kumar, A., Inbarajan, A. A modified technique to fabricate a complete hollow obturator for bilateral maxillectomy in a patient with mucormycosis-A technical case report. *Spec Care Dentist*. 2019 Nov;39(6):610-616.

14. Asher, E. S., Psillakis, J., Piro, J., Wright, R. Technique for quick conversion of an obturator into a hollow bulb. *J Prosthet Dent*. 2001 Apr;85(4):419-20.

15. Gupta AK, Rekha G, Shubhra G. Spring retained surgical obturator followed by closed hollow definitive obturator using lost wax bolus technique in a total maxillectomy patient- a case report. *J Oral Biol Craniofac Res*. 2021 Jan-Mar;11(1):17-21

16. Gandhi N, Talwar H, Gandhi S, Alageshan V, Abraham G, Mehdiratta S. Prosthodontic rehabilitation of a sub-total maxillectomy defect with a definitive hollow obturator prosthesis using the modified lost-wax concept: A novel technique. *Natl J Maxillofac Surg*. 2018 JulDec;9(2):225-228.