# TREATMENT APPROACH BY SOLID OBTURATOR FOR PATIENTS WITH MAXILLARY RESECTION

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**Abstract: Introduction:** Tumors increasing frequency in maxillo-facial region is the reason for developed of patient's cases of maxillary resection. Immediately after the operative resection some defects are appeared and provoke patient's speech, mastication and esthetic damages in different stages. Depending on size and defect location prosthetic and surgery methods are usually applied.

**Aim:** The main goal of this clinical research is to present treatment approach for solid obturator making for the task of healing patients with a great maxillary defects and to assess its effectiveness on patient's speech, mastication and swallowing restoration and rehabilitation.

**Materials and methods:** One clinical case is analyzed. Patient with maxillary defect after the surgery resection is presented. Intraoral examine shows resection of the right part of the alveolar ridge and upper jaw. It is observed that alveolar ridge after 13 is not destroyed and dentition is saved. Because of defect localization and its retentiveness treatment plane is buildet involving solid obturator making. Alginate impressions are taken from the both jaws. Next step is preparing of individual tray from light cured resin used for functional impression in wax lining of the prosthesis borders and silicon cream application. What is followed is preliminary wax modeling of the gypsum master cast for avoiding undercuts and retentive regions. After the model duplicating retentive two wire clasps are fixed on 13 and 26 allowed prosthesis retention and stability. Next step is occlusal centric relation fixation by occlusal rims and checking the artificial teeth arrangement. Finally, high temperature polymerization is processed. Prosthesis is acrilyzed and polished.

**Results:** Good sealing is achieved. Tight penetration of the obturator part allows fast restoration of the patient's speech, mastication and swallowing and rehabilitation. Results are very satisfied. Both of them occlusal height and obturator height provide right articulation and normal breathing. Despite the greater obturator weigh a very good retentiveness end stability are observed. Preliminary reduction of the obturator height gave possibility for successful restoration of the destroyed functions.

**Conclusion:** Prosthetic treatment with a solid obturator is a relatively rarely used method for the treatment of patients with large maxillary defects. However, the presented clinical case showed that the presence of teeth, the favorable location of the defect and the use of an appropriate technique allows the successful restoration of damaged functions.

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

### 1. INTRODUCTION

Surgical treatment of maxillary tumors destroyed the septum between oral and nasal cavity which lead to the serious violations as inability for eating, straitened speech and breathing (Flores-Ruiz, R. et al., 2017). Morphological and functional disturbances very often increased accompanying radiation and chemotherapy (Hahn, T. R. et Krüskemper, G., 2007). The observed changes seriously impair patients' quality of life, affecting their well-being and social contacts (Ali, M. M. et al., 2018). Studies show that despite the success of modern surgery, prosthetic methods remain the mainstay of treatment for patients with maxillary resection (Sahoo, N. K, et al., 2016). Different types of used prosthetic constructions depending on the type and shape are divided into hollow and solid. Most authors (Kulkarni, P. et al., 2017; Chaubey, P. et al., 2018) recommend treatment with hollow obturators, assuming that the reduced weight and reduced volume create prerequisites for better retention and stability. Research works show that their use provides better speech recovery and facilitates articulation (Kumar, P. et al., 2012). The main disadvantage of treatment with open hollow obturators is the impossibility of good cleaning and the risk of infections (Asher, E. S. et al., 2001). Numerous treatment methods for patients with maxillary resection healing are described in the literature. Most of them use acrylic plastics to make the shutter, believing that this ensures their good retention and stable support (Ali, R. et al., 2015). Their disadvantages are the solid transmission of masticatory pressure and the presence of residual monomer, which has a toxic effect on the surrounding tissues. This is the reason why some authors carry out the treatment with obturators made of light-curing plastics (Kar, A. K. et al., 2013). Prosthetic rehabilitation after maxillary resection has different meanings for patients and depends on gender, age, social status and occupation (Chen, C. et al., 2016). The priorities of individual patients also vary considerably, ranging from restoration of nutrition to solving aesthetic problems (Dholam, K. et al., 2020). This requires that the

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treatment is in accordance with both the basic prosthetic principles and the individual features of the clinical case (Lee, S. et al., 2015). Particular attention is paid to factors that may affect the retention and stability of the obturator, as this is leading to the quality of the patient life (Singh, M. et al., 2020). In cases where the soft palate is also affected, an extension of the obturator in the distal part is required, after taking a functional impression with wax material (Turner, G. E. et Williams, W., 1991; Shetty, R. et al., 2009).

## 2. AIM

The main goal of this clinical research is to present treatment approach for solid obturator making for the task of healing patients with a great maxillary defects and to assess its effectiveness on patient's speech, mastication and swallowing restoration and rehabilitation.

## 3. MATERIALS AND METHODS

A treatment method for a 65-year-old patient with a large maxillary defect due to cancer surgery is presented. Examination showed that the right part of the upper jaw was resected together with the alveolar ridge after tooth 13, with residual dentition preserved (Fig. 1). The defect increased in the distal direction, passing in a small area of the soft palate. This localization and high retention require the development of a treatment plan for the solid obturator making.

## Fig. 1. Intraoral patient's view



## Fig 2. Completed obturator



Preliminary impressions of both jaws were taken with alginate. In the laboratory, an individual tray of light-curing resin was extended at the distal end. During the next clinical visit, the tray borders were edged with a fluid impression material that formed functionally along the boundaries of the defect. Particular attention was paid to the area of the soft palate, where multiple tests were performed. The final functional impression was taken with silicone cream material after the defect filling with gauze. A gypsum model was cast in the laboratory, on which the retention areas were isolated by wax modeling and the height of the obturator part was determined. Due to the involvement of the soft palate and the need to improve the phonetics, a height of 10 mm was chosen. The model thus prepared was duplicated and wire clasps on teeth 13 and 26 were made on the final working model. In the next clinical stage, the height of the obturator part allows trouble-free. The obturator was finished with heat-curing resin and adjusted in the patient's mouth, which was facilitated by preliminary modeling in the laboratory (Fig. 2). Control examinations were performed to monitor tightness and occlusal ratios.

## 4. **RESULTS**

The results of the treatment showed good sealing of the defect (Fig. 3). The tight penetration of the obturator part allowed the restoration of speech, nutrition and liquid intake. The predetermined height of the shutter helped for proper articulation and speech. The created septum between the oral and nasal cavities reduces nasal speech and improves the patient's breathing. Despite concerns about the weight and volume of the shutter, good retention and stability were ensured. The laboratory shaping of the replacement part of the obturator, in which the strongly retention areas of the defect were isolated, allowed the traumatic transmission of the masticatory pressure. Randomized examinations showed no decubitus injuries and normal adaptation to the prosthesis.

# KNOWLEDGE – International Journal Vol.41.3

#### Fig. 3. Adjusted obturator



#### 5. DISCUSSION

The methodology described with preliminary modeling and duplication of the gypsum model allowed precise shaping of the replacement part of the obturator, in accordance with the relief and the shape of the maxillary defect. This made it possible to adjust the height of the shutter and prevent the acrylic resin from entering the defect indefinitely. Due to the involvement of the soft palate and severe speech impairment, the replacement part of the obturator was made with a height of about 10 mm, which is considered optimal for the restoration of proper articulation and phonetics. The achieved positive results did not confirm the opinion that the treatment of large maxillary defects is possible mainly with open obturators (Kulkarni, P. et al., 2017; Chaubey, P. et al., 2018). Despite the volume of the defect, good retention and stability of the shutter was ensured, which according to some authors is impossible with tight shutters (Kumar, P. et al., 2012). The main difficulties in treating the patient stemmed from the involvement of the soft palate, which required precise functional shaping of the imprint in the area of the defect. The use of wax impression material confirmed the thesis of their advantages (Turner, G. E. et Williams, W., 1991; Shetty, R. et al., 2009). This allowed the production of a dense obturator made of acrylic resin, which according to our and most observations provides the necessary retention and stability of the prosthesis (Ali, R. et al., 2015). The results confirmed that a well-designed obturator is a major tool for improving the quality of life of patients with maxillary resection (Chen, C. et al., 2016; Dholam, K. et al., 2020).

#### 6. CONCLUSION

Prosthetic treatment with a solid obturator is a relatively rarely used method for the treatment of patients with large maxillary defects. However, the presented clinical case showed that the presence of teeth, the favorable location of the defect and the use of an appropriate technique allows the successful restoration of damaged functions.

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