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OPPORTUNITIES FOR TREATMENT WITH A TEMPORARY OBTURATOR MADE OF THERMOPLASTIC FOIL

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Abstract: Prosthetic treatment with a temporary obturator is an intermediate stage in the overall prosthetic rehabilitation of patients with maxillary resection. According to prevailing opinions, treatment with a temporary obturator should start around 2 weeks to 2-3 months after resection and to continue until the final completion of the healing processes in the defect. Due to the dynamic changes in the defect, this treatment stage is associated with many difficulties, requiring frequent correction of the obturator and up to 12-14 clinical visits on average. The aim of the research is to track the opportunity for fabrication of a temporary obturator of thermoplastic foil with vacuum forming apparatus and its efficiency for restoring speech and fluid intake in patients with maxillary resection. For the aim of the study we conducted a treatment of a 45-year-old patient operated a week ago for maxillary carcinoma. As a result, the left alveolar bone and a part of the hard palate with a diameter of 10 mm were resected, with teeth 13 to 23, 16 and 17 preserved. The defect was padded with gauze and an impression with an irreversible hydrocolloid impression material was taken. In the laboratory a grade 4 plaster working model was cast on which the borders of the palatal plate were outlined. For the frontal teeth, these were the cervical areas of the teeth, and for the distal - their equators. In the area of the defect and the missing teeth the border reached the transitional fold, and distally - the soft palate. The plate was made from foil of 1 mm diameter which was drawn onto the model with a vacuum forming apparatus and was cut along the indicated borders. The palatal plate - obturator successfully closed the comunication to the nasal cavity and restored the opportunity for fluid intake, which was the main problem for the patient. The use of a foil with a thickness of 1 mm provided stability and resistance of the construction. As a result of this, the necessary hermetic seal of the defect was achieved and the speech of the patient was normalised. The described treatment methodology with a temporary obturator allows the successful restoration of speech and fluid intake during the healing processes in the defect. The main advantages of the method are the fast and easy fabrication, the opportunity for multiple corrections and the short period of adaptation.

Keywords: *maxillary carcinoma, maxillary resection, maxillary defect, obturator, thermoplastic foil.*
Field of the paper: Medical sciences and Health.

1.INTRODUCTION

Prosthetic treatment with a temporary obturator is an intermediate stage in the overall prosthetic rehabilitation of patients with maxillary resection (Ahmed, Z.U. et al., 2020). According to prevailing opinions, treatment with a temporary obturator should start around 2 weeks to 2-3 months after resection and to continue until the final completion of the healing processes in the defect (Sharaf, M.Y. et al., 2018). Due to the dynamic changes in the defect, this treatment stage is associated with many difficulties, requiring frequent correction of the obturator and up to 12-14 clinical visits on average (Rosen, E.B. et al, 2019). The necessity for rebasing and the short period of use is the reason why methods are often used in which an existing surgical obturator is modified into a temporary one (Mohamed, K. et al., 2021). In many of them, a silicon material for direct or indirect rebasing is used which protects mucosa from decubital injuries (Yanamoto, S. et al., 2020; Ramasamy, T.V. & Chandra, J., 2020). Similar results are found with polyurethane foam (Aparna, G. et al., 2022). Treatment methods with light-cured acrylic resins are also used, which provides stability and resistance of the obturator as well as opportunity for its fast and easy correction (Da Silva, L. et al., 2004). The necessity for frequent rebasing during the healing process is a reason why some authors consider that there is no clear difference between a surgical and a temporary obturator (Carl, W., 1976).

Preferred treatment methods with a temporary obturator are those that preserve the shape of the palate and natural teeth (Haraguchi, M. et al., 2006; Bettie, N.F., 2017). Such a method using thermoplastic foil and vacuum forming apparatus allows easy fabrication and fast adaptation to the obturator, but increases the vertical size and makes insertion in the defect difficult (Shimizu, H. et al., 2009). To solve this problem

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and to improve the strength of the construction, it is recommended to combine hard thermoforming splint material and heat-cured acrylic resin (Buzayanm, M.M. et al., 2013).

A main problem in the prosthetic treatment of patients with maxillary resection are the accompanying chemotherapy and radiation therapy which require the use of the temporary obturator for a long period of time (Devi, E.M. et al., 2022). In those cases the stability and the durability of the obturator are provided by heat-cured acrylic resin (Jehn, P. et al., 2022). Regardless of the methods used and the duration of the treatment, there is a consensus on the important role of the temporary obturator on the restoration of eating, speech and self-esteem of the patient (Corsalini, M. et al., 2021).

2.AIM

The aim of the research is to track the opportunity for fabrication of a temporary obturator of thermoplastic foil with vacuum forming apparatus and its efficiency for restoring speech and fluid intake in patients with maxillary resection.

3.MATERIALS AND METHODS

For the aim of the study we conducted a treatment of a 45-year-old patient operated a week ago for maxillary carcinoma. As a result, the left alveolar bone and a part of the hard palate with a diameter of 10 mm were resected, with teeth 13 to 23, 16 and 17 preserved. (Fig. 1). The ocurred communication to the nasal cavity mainly made fluid intake and speech difficult. To solve these problems, during the upcoming radiation and chemotherapy, a plan was formed to fabricate a palatal plate - obturator from thermoplastic foil. The defect was padded with gauze and an impression with an irreversible hydrocolloid impression material was taken. In the laboratory a grade 4 plaster working model was cast on which the borders of the palatal plate were outlined. For the frontal teeth, these were the cervical areas of the teeth, and for the distal - their equators. In the area of the defect and the missing teeth the border reached the transitional fold, and distally - the soft palate. The plate was made from foil of 1 mm diameter which was drawn onto the model with a vacuum forming apparatus and was cut along the indicated borders (Fig. 2 a, б). In the next clinical stage the plate was adjusted in the mouth of the patient without any problems.

Fig. 1. Intraoral view of the patient

Fig. 2. The fabricated palatal plate - obturator (a) adjusted on the model (б)

4. RESULTS

The palatal plate - obturator successfully closed the comunication to the nasal cavity and restored the opportunity for fluid intake, which was the main problem for the patient. The use of a foil with a thickness of 1 mm provided stability and resistance of the construction (Fig. 3). As a result of this, the necessary hermetic seal of the defect was achieved and the speech of the patient was normalised. The elasticity of the material that was used allowed easy and non-traumatic placement in the area of the defect, which prevented the emergence of decubital injuries. The minimal volime and thickness of the plate provided fast and unproblematic adaptation. The control checkups throughout the chemo- and radiation therapy did not show changes in the retention and the stability of the plate.

Fig. 3. The adjusted palatal plate - obturator in the mouth of the patient

5. DISCUSSIONS

The described treatment method allowed fast and easy fabrication of the obturator within one day. The use of thermoplastic foil proved to be an exceptionally convenient material for the fabrication of a temporary obturator. The easy technology, the opportunity for fast adjustment as well as the elasticity of the material allowed non-traumatic placement in the area of the defect. The treatment results confirmed the opinion that thermoplastic foil can be successfully used for the fabrication of a treatment obturator (Shimizu, H. et al., 2009). Due to the small size of the defect there were no problems with its placement, which some authors point out as disadvantages (Shimizu, H. et al., 2009). Similar to other treatment methods preserving the shape of the palate and the natural teeth, an easy adaptation to the obturator was observed (Haraguchi, M. et al., 2006; Bettie, N.F., 2017). The used foil with a thickness of 1 mm provided the necessary stability without the necessity of adding heat-cured acrylic resin, which is recommended by other authors (Buzayanm, M.M. et al., 2013). The durability of the obturator throughout the whole period of chemo- and radiation therapy did not confirm the opinion that this is possible only with heat-cured acrylic resin (Jehn, P. et al., 2022). The successful restoration of speech and the opportunity for fluid intake confirmed the views that the temporary obturator improves the quality of life of the patients (Corsalini, M. et al., 2021).

6.CONCLUSIONS

The described treatment methodology with a temporary obturator allows the successful restoration of speech and fluid intake during the healing processes in the defect. The main advantages of the method are the fast and easy fabrication, the opportunity for multiple corrections and the short period of adaptation.

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