A detachable silicon obturator fitted after bilateral maxillectomy: A clinical report

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A patient underwent treatment for malignant melanoma which necessitated the excision of all his teeth, the alveolar bone, and the hard palate. Prosthodontic rehabilitation was required to recover the processes of mastication, speaking and swallowing, as well as improving aesthetics. A silicon obturator was fabricated with a soft denture liner material, inserted into the maxillary defect, and an acrylic denture was mechanically connected to the silicon obturator. After one year of service, the patient was functioning well with the obturator prosthesis, and no accidental changes were observed. This clinical report suggests that a detachable silicon obturator could be an option in the recovery of postsurgical maxillary defect. (Int Chin J Dent 2007; 7: 75-77.) Key Words: biomaterial, maxilla, obturator prosthesis, tumor.

Introduction

Surgical excision is the primary treatment choice for malignant tumors affecting the maxillae, and the resulting maxillary defect is commonly repaired with obturator prostheses. Obturators assist mastication, speaking, swallowing and respiration, and thus restore the quality of life.¹⁻³ As long as some natural teeth exist or dental implants are applied, the retention of the obturator can be ensured through clasps and/or attachments.⁴⁻¹⁰ However, when surgical excision has extended to all the teeth, the alveolar bone, the hard palate, and the paranasal sinus, it leads to difficulty in retaining the obturator prosthesis.^{3,4} In such cases, it is important to use an obturator prosthesis of special quality. Conventional acrylic obturator prostheses inserted into the undercut of maxilla sometimes injure soft tissues causing pain. The present report describes an obturator fabricated completely from silicon-based soft denture liner material supporting the acrylic denture.

Clinical Report

A 52-year-old man was referred to the University Hospital of Medicine and Dentistry with the main complaint being hard palate swelling. Based on the diagnosis of malignant melanoma on the maxilla, bilateral maxillectomy, radiation and chemotherapy were selected as the course of treatment.



Fig. 1. The maxilla of the patient one-year after bilateral maxillectomy.

Fig. 2. The working cast used in the present report.

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The excision extended to all the teeth, the alveolar bone, and the hard palate (Fig. 1). Six months later, the patient was examined in the prosthodontic division of the hospital; he requested a recovery of oral functions, such as mastication, speaking, and swallowing. A prosthodontic rehabilitation using an obturator prosthesis was planned to repair the postsurgical defect and recover oral function.



Fig. 5. An acrylic denture mechanically retained on the obturator.

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The obturator prosthesis was fabricated according to the procedure described below.

- A definitive impression of the maxillary defect was taken with an impression material (Exafine, GC Corp., Tokyo, Japan) and a custom impression tray (Ostron II, GC Corp.). A wax pattern (Paraffin Wax, GC Corp.) was formed on a working cast (New Plastone, GC Corp.) (Fig. 2) and flasked.
- 2. An auto-polymerizing silicon-based soft denture liner material (Sofreliner Tough Medium, Tokuyama Dental Corp., Tokyo, Japan) was packed into the modified working cast (Fig. 2) to form a silicon obturator (Fig. 3).
- 3. An acrylic denture was fabricated and fitted to the maxillary defect with the silicon obturator (Figs. 4 and 5).

Following placement of the obturator prosthesis, observations were taken on the second week, the first month, the third month, and at intervals of three months thereafter. The patient complained of neither dislocation nor pain when wearing the obturator prosthesis. One year after the placement of the obturator prosthesis, the patient was functioning well, the tissue also appeared healthy.

Discussion

Amongst a variety of factors which affect masticatory performance while using obturator prostheses, surgical resection of the hard palate has been reported as one of the most important in determining masticatory performance.^{1,3} When the maxillary defect extends to more than half of the hard palate, masticatory performance

with obturator prostheses appears to decline considerably.³ According to this criterion, it was anticipated that it would be very difficult for the patient to be comfortable and gain in an aesthetic sense while using the obturator prosthesis. Contrary to what was anticipated before the prosthodontic treatment though, the patient satisfactorily recovered oral functions and enjoyed improved aesthetics.

On the other hand, surgical resection of the soft palate generally causes dysfunction of speech and swallowing, as it impedes velopharyngeal closure.² Fortunately, for this patient, the soft palate was intact. With the obturator prosthesis, the patient could speak clearly and swallow food.

When planning prosthodontic management, we considered some treatment options such as distraction osteogenesis, bone grafts, and osseointegrated implants.⁹ However, taking into account the possibility of additional surgical treatment and the undesirable effect of radiation, these treatment options were not selected.

Although the silicon-obturator was mechanically attached to the lower side of the maxilla, little support against occlusal force was obtained. An acrylic denture was mechanically retained on the silicon obturator without adhesives. No molar teeth were put in the acrylic denture, as no antagonistic molar existed in the mandible, and this also contributed to lighten the prosthesis. Furthermore, when the silicon obturator became damaged or dirty, it could be reproduced easily using the working cast (Fig. 2). This clinical report suggests that a detachable silicon obturator could therefore be a definitive or temporary option in recovery of postsurgical maxillary defect.

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