### Fabrication of a Custom Protective Guard for an ERA Maxillary Overdenture: A Case Report

**SUMMARY**

Management of complete edentulous patients suffering neuromuscular disorders or having parafunctional habits, such as bruxism, is a challenging task. It requires modification of traditional techniques for complete denture construction even in overdenture cases. Additional appliances, such as a protective guard, may also be necessary.

This clinical report addressed the difficulties encountered and the prosthodontic management of a 64-year-old medically compromised patient. A maxillary overdenture was constructed, as well as a protective night guard for the overdenture abutments, to avoid wear due to the patient’s parafunctional habits.

**Keywords:** Overdenture; ERA Attachments; Protective Acrylic Guard; Prosthodontics

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### Introduction

Placing an overdenture on natural teeth or dental implants is an alternative solution for many patients who have restrictions or difficulties in the use of conventional complete dentures. Some of these restrictions include absorbed alveolar crests, poor neuromuscular adaptation and maxillofacial deficiencies after surgery. The use of attachments on natural teeth or implant abutments increases retention and stability, minimizing possible complications that can be caused from a removable prosthesis’ use. The patients with this kind of prosthetic intervention adjust themselves faster to the new conditions.

As with conventional complete dentures, daily removal of overdentures is recommended in order to allow supporting tissues to relax and rebound. Removal of the prosthesis is recommended to be done overnight as at that time the aesthetic and functional needs are not of a particular concern. The prosthesis’ removal, may allow for undesirable contacts between the abutments and the artificial or natural opposing dentition, or even with the soft tissues. These contacts, especially in cases of parafunctional habits, such as bruxism, may cause discomfort to the patient and lead to wear or fracture of teeth or attachments. To avoid such consequences, the use of protective elastic cups is suggested over metallic overdenture attachments, such as the ERA. However, there are restrictions with their use, since time and skills by the patient is required for the implementation of the individual elastic cup on each abutment. This is a particularly difficult process for elderly patients with physical disabilities. Furthermore, the soft material’s wear is not eliminated and there is risk of detachment and swallowing or aspiration of the elastic parts during sleep.

For these reasons the construction of protective guards, which are supported by the overdenture’s abutments is a more indicative solution.

The present paper describes fabrication of a protective overdenture night-guard with the process of hot cured acrylic resin over teeth, reconstructed with ERAs on cast posts.

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### Clinical Review

A 64-year-old male patient presented in the Graduate Prosthodontics Clinic of the University of Athens, wearing a maxillary overdenture, retained by cast ERA attachments over metallic cups using teeth #11, 14 and 15 as abutments. Prosthetic rehabilitation of the mandible consisted of a metal-ceramic fixed partial denture (FPD) with teeth #43, 33, 35 as abutments, and a removable partial denture (RPD) for the posterior area.
In the patient’s medical history a bone marrow transplantation 9 years ago was reported due to myelodysplastic syndrome. Removal of a vocal cord polypoid was done 4 years ago. The patient received cortisone (Dexamethasone tab.), systematically, and was under medical treatment for high blood pressure and hypercholesterolemia.

In his dental history presence of angular cheilitis (Fig. 1) of pharmaceutical aetiology was reported, showing exacerbations and remissions. Extended areas of atrophic mucosa, combined with non-peeled white lesions were observed on the left buccal area and the left side of the palate. The mucosa was non-elastic and fragile, particularly on the left side of the mouth, which bled easily. Furthermore, upon removal of the overdenture, wear of the metallic ERA on tooth #11 was observed (Fig. 2) due to the contact with the opposing metal-ceramic FPD. The other 2 attachments, placed on teeth #14 and 15, were not showing wear since they did not have antagonists as the lower PRD, which was being removed from the mouth at night as well (Fig. 3). The abraded surface of the attachment combined with the extensive wear of the existing overdenture lead to the conclusion of parafunction.

The patient desired to replace the overdenture due to the extended wear of the acrylic teeth (Fig. 4), as well as loss of retention (Fig. 5). The treatment plan also included construction of a protective acrylic night-guard over the ERAs.

To compensate for the wear of the acrylic teeth and reduce the symptoms of angular cheilitis, the new overdenture was decided to be fabricated in a slightly increased vertical dimension of occlusion (VDO). The absence of stomatitis during clinical appointments allowed selective pressure to be applied in order to achieve border moulding and a successful final impression. The attachments were activated intra-orally while, due to lack of space, metallic housings were not use for the retentive ERA elements.
Fabrication Technique for the Protective Night Guard

Following delivery of the overdenture, the protective night-guard was fabricated as follows:

Laboratory ERA retentive elastic elements (black colour) were placed on the laboratory analogues of the working cast which had been duplicated. The protective night-guard had to be teeth supported in order to achieve tissue relaxation. Therefore, the dimensions of the night-guard had to be limited;

A record base with wax rims was fabricated on the duplicated cast (Figs. 6 and 7);

The record base was placed into the mouth and VDO was adjusted. The desired VDO was the same as that of the new overdenture;

The night-guard’ wax-pattern was removed from the working cast and, using a sharp instrument, a small amount of wax was removed from the reception area of the retentive ERA elements;

The night-guard was fabricated with heat cured methyl-methacrylate resin;

The guard was activated intra-orally (Figs. 8A and 8B) using the laboratory (black coloured) retentive elements and cold cured acrylic resin. The occlusion on the guard was adjusted in order to achieve equally distributed occlusal contacts.

Delivery of the Night Guard - Maintenance

At a delivery appointment, occlusal contacts, retention and stability of the guard (Figs. 9A and 9B) were adjusted. Emphasis was given to the ease of use of the device, as well as avoidance of potential discomfort and trauma. The patient was instructed to use the protective guard each time the overdenture (Fig. 10) was being removed from the mouth in order to protect the metallic attachments from further wear. A recall schedule was set for the patient, once a week for the first month, once a month for the next 3 months and then every 6 months. During the first recall examination, the size of the night-guard on the left side was reduced as the mucosa, being non-elastic and fragile, was traumatized causing bleeding.

The laboratory retentive elements which were decided to be activated for the intraoral implementation of the device provided comfort ease of use and sufficient level of retention. In case additional retention was needed, these elements could be replaced with more retentive ones, available for ERA's.
Conclusions

Parafunctional habits, such as bruxism, are not only observed in patients with natural dentition or fixed prostheses. They also appear in patients with extensive edentulous areas using removable prosthetic appliances. Therefore, it is essential to ensure protection of the dental or mechanical overdenture abutments with the fabrication of protective guards, which can be easily adjusted and individualized depending on the patient needs.

References


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