

CERVICAL PROXIMAL REST ACTING AS A SUPPORT FOR POLYAMIDE REMOVABLE PARTIAL DENTURES

Dragoş Smărăndescu

Assist. Prof., Prosthesis Technology and Dental Materials Department, Faculty of Dentistry, University of Medicine and Pharmacy "Carol Davila" - Bucharest; Private dental praxis, Romania

ABSTRACT

Removable dentures may cause damage to the periodontium of the teeth that limit the edentation. Most of the RPD's should be designed with a rest for a better distribution of forces on both the edentulous crest and the remaining teeth. Polyamide dentures that have no metal framework may be designed with occlusal rests on neighbouring teeth but the flexibility of the material is a disadvantage for the stability of the denture. The cervical proximal rest (CPR) may be a solution in such cases as it is placed on the proximal surface of one or more remaining teeth, thus ensuring a good stability of the denture without compromising the aesthetics as it is practically invisible. The CPR can be an appendix of a metal-ceramic or metal composite crown, or it can be resin-bonded to one of the remaining teeth.

Keywords: rest, polyamide, removable partial denture

INTRODUCTION

Rest seats are stable, regardless of the material on which they are prepared (amalgam, resin, enamel, composite) [1, 2] but the difficulty in prescribing them and in doing the right intraoral preparations remains an issue for GDP's. [3]

Another problem of most of the rests is that they are visible; therefore different solutions have been suggested to improve aesthetics. [4]

Most of the times, rests are associated with metal clasps which are visible on the buccal side of the teeth; Orsi et al. showed that resin-bonded extracoronary attachments may be indicated for the abutment teeth of removable partial dentures, especially for anterior teeth when a cingulum rest must be provided. This type of treatment has a series of advantages such as minimal tooth reduction, supragingival margins, favourable stress distribution, and improved aesthetic appearance. [5]

Shimizu et al. reported a case in which

they used resin-bonded castings with a cingulum rest seat and a guide plane for a removable partial denture. [6]

In an in vivo experiment, Kawata et al. used a force-measuring device with a piezoelectric transducer mounted on the mandibular right second premolar of a subject with an edentulous maxilla. The experiment showed that the magnitude of the forces was higher and the direction was more posterior without the RPD in place. The direction was most posterior with an RPD with a distal rest only and most anterior with an RPD with a mesial rest only. The 3-dimensional forces exerted on an abutment tooth thus depend on both the presence of a denture and the rest location. [7] To counteract this displacement one would want to place the rests on the side of the abutment where there is either a neighbouring tooth or a limited edentation.

Having a long clinical experience with polyamide RPD's we noted that a rest is needed in order to prevent bone resorption around the teeth that limit the edentation,

especially in Kennedy class I cases in which a good distribution of forces and long saddles of the denture are generally regarded as compulsory requirements.

The cervical proximal rest is (as seen from the occlusal plane) a triangle shape proximal cantilever of not more than 2 mm (Fig. 1).

The first case described (Fig. 2) is a 47 year old female patient having the following remaining teeth in the mandible:

- the four incisors,
- the right canine and the right first premolar covered by 2 united crowns, with a cervical proximal rest on the distal surface of the premolar
- the left canine - cervical proximal rest on the distal surface,
- the right third molar that had a completely destroyed crown and had to be restored with a casted metal post and a juxtagingival plate, in order to act as a rest under the saddle of the RPD,
- the left third molar, covered by a metal ceramic crown with a mesio-occlusal rest seat.

The denture was made with TCS polyamide and has a favourable aesthetic appearance (Fig. 3).

In the following case (60 year old female patient) the remaining teeth in the mandible were from left canine to right first premolar. The lower right canine and the right first premolar had previously been covered by metal-composite crowns. The first right premolar was restored with carbon fiber post and core material (Fig. 4).

The treatment plane was to cover them with metal ceramic crowns with a cervical proximal rest on the distal of the first premolar and to make a MOD preparation on the lower left canine for a resin bonded cervical proximal rest on the distal surface (Fig. 5). The cervical proximal rest can be cast with the crown of the abutment tooth or it can be resin bonded to it.

The rest has a highly polished mucosal

surface and a convex shape in contact to the gum in order to avoid plaque accumulation (Fig. 6).

An overall image after the cementation of the fixed restorations is shown in Fig. 7.



Fig. 1. Cervical proximal rest on first left lower premolar. Occlusal view.



Fig. 2. Case 1 after cementation of metal-ceramic crowns (crown on first left lower premolar and crown on lower right canine united with crown on first right lower premolar). Cervical proximal rest is seen on the distal side of the first left lower premolar; the same type of rest is placed on the distal side of the first right lower premolar.



Fig. 3. Flexible removable denture in place.



Fig. 4. Kennedy class I edentation. Two abutments in the right quadrant prepared for crowns (united) and cervical proximal rest on the distal of the premolar; cervical proximal rest to be resin-bonded on minimally prepared left canine. Treatment plan: polyamide RPD.



Fig. 5. Design of the preparation of the left canine detailed. Please see the next image – the metal frame to be resin-bonded to the tooth.



Fig. 6. Metal framework of the cervical proximal rest to be resin-bonded to the left lower canine.



Fig. 7. Fixed restorations cemented. Note the two cervical proximal rests.

DISCUSSIONS

If bonded to the teeth limiting the edentation, the cervical proximal rest is a minimal invasive solution ensuring the protection of the marginal periodontium and a good stability of the RPD. Contrary to most of the extra coronal attachments, the forces exerted on the tooth in case of crest resorption are minimal, as the polyamide clasps are extremely gentle and highly elastic.

An even better prognosis for the abutment teeth is achieved if there are two crowns united and cervical proximal rests associated. The rest and the polyamide clasp act similar

to an extra coronal attachment that does not wear, nor exerts damaging forces on the abutments.

CONCLUSIONS

Further tests should be carried out with resin bonded zirconia cervical proximal rests, that will ensure better aesthetics and will be better tolerated by the gums. Cementation of zirconia implies the use of organophosphate primers. Organophosphates should be applied to the entire surface of the zirconia restoration to avoid water sorption.

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