Clinical Report

Ersatz Gingiva

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Artificial gingival substitution is a compliant entity for managing gingival recession conditions, where muco-gingival surgery is anticipated to produce less than sought-after outcome. Although there are illustrated methods of prosthetic gingival replacement in association with fixed partial dentures in literature, there is no accessible documented method in hand for gingival substitution in combination with removable partial dentures. This article will establish and state novel methods of artificial gingival substitution, in union with removable partial dentures. Three different modalities are depicted, each with a case report, thereby emphasizing the science, materials and techniques in the wake of each modality.

Key words: Black triangle, block-out impression, gingival veneer

INTRODUCTION

Gingival recession is the most common clinical manifestation of all the oral diseases, as it has an incidence rate of as high as 100% in adults above 50 years of age.[1] A gratifying smile is an assembly of various components. Marginal gingiva and inter-dental papilla, having high aesthetic value, are mulled over as the chief components of a smile. Gingival recession can cause loss of inter-dental papilla and lead to open embrasures, which show in the form of black triangles.

The black triangles that appear as a result of gingival recession will distort an amiable smile. The condition can be corrected or managed by two approaches. The first option is muco-gingival surgery or gingival plastic surgery, with gingival augmentation coronal to the recession. This is suitable for mild to moderate type of gingival recessions. In severe gingival recession conditions, as in grade III and grade IV recessions, muco-gingival surgeries may give less predictable esthetic results or might cause recurrence.

The second option, gingival replacement with artificial substitutes, is more helpful in managing severe gingival recession situations. Prosthodontists can unravel the problem of severe gingival recession through this second option. There are methods of replacing gingiva in association with a fixed partial denture, by using gingival porcelains and silicones etc., that have been already stated in the literature.[2,3] But there is no documented method available that describes gingival substitution in combination with a removable partial denture.

The objective of this article is to establish and state novel methods of artificial substitution of gingiva, in union with removable partial dentures. Three different modalities of gingival replacement are depicted and each modality is described with a case presentation, thereby illustrating the science, materials and techniques involved in it.

The term *ersatz gingiva* designates gingival replacement with artificial substitutes, in association with a removable partial denture. The type of gingival prosthesis suited for a specified condition is decided, based on three determinants: (1) Nature of edentulous span (2) Availability of retentive features for the gingival prosthesis, in the form of open inter-dental embrasures, and (3) Type of removable partial denture preferred.

Based on these three determining factors, the article proposes three modalities of artificial gingival replacements, in union with removable partial dentures. They are: (1) Silicon gingival prosthesis (2) Soft liner gingival veneer as a component part of the partial denture and (3) Flexible partial denture as gingival veneer. The first modality can be preferred when adequate retentive features are available for the gingival prosthesis in the form of open gingival embrasures. The second modality can be chosen when there are insufficient retentive features for the gingival prosthesis and hence there is a need to be integrated with the removable partial denture for

retention. When there are insufficient retentive features and there is an anterior edentulous space, the third modality, flexible partial as gingival veneer, can be chosen. The anterior edentulous space can be utilized as a retentive aid and flexible partial denture with integrated gingival veneer can be given in such cases. The science, materials and techniques concerned with these three modalities will be depicted with the help of a case presentation each.

CLINICAL REPORTS

First modality - Silicon gingival prosthesis

The case shown in Figure 1 presented with bilateral posterior edentulous spans in the maxillary arch and gingival recession in the maxillary anterior region. There were adequate retentive aids for the gingival prosthesis, in the form of open gingival embrasures. Hence, the first modality, silicon gingival prosthesis, was intended for the case. A cast partial denture was considered for restoring the maxillary arch. This denture framework would provide additional retention for the gingival prosthesis, through the proximal plates and the gingival approaching arm of the clasps.

A block out impression[4] was made of the maxillary dental arch for accurate reproduction of the inter-dental region. The inter-dental region was blocked out with putty consistency addition silicone elastomeric impression material [Figures 2-3]. A single stage putty light body impression was made and the cast obtained. The wedges were incorporated within the cast and they were removed after retrieval of the cast. Thus the inter-dental open gingival embrasures were reproduced exactly, which is not easy to achieve with regular impression techniques.

Wax-up was done for the inter-dental papilla and gingival prosthesis. The wax pattern was extended beyond the proximal aspect of the distal most teeth. This would aid in the retention of the gingival prosthesis by means of the placement of the cast partial denture, which thereby brings the proximal plate of the framework in close adaptation over the gingival prosthesis. The pattern was completed, tried and verified in the patient's oral cavity.

A customized gingival shade guide was fabricated using the ferro and earth based color pigments that are supplied with factor II silicone. Shade matching of the gingiva was done with the help of this shade guide.

The silicone used for the fabrication of the prosthesis was an intra oral silicone.[5] Chemically it is known as Methacryloxypropyl-terminated polydimethylsiloxane (MPDS). It is a room temperature vulcanizing silicone, which is commonly used for fabricating tongue prosthesis. Its commercial name is MDX 4-4210 Silicone. Mold space was created and the material was packed under pressure into the mold space. Working time and initial setting time of the material are four to five minutes and 15 minutes, in that order.

The prosthesis was not retrieved until the final setting time of 24 hours was fulfilled. A curing temperature of around 23° C [73° F] was maintained throughout this period. The prosthesis was retrieved and placed in the patient's oral cavity. Ample retention and adaptability was accomplished due to the flexibility of the material and engagement of the prosthesis into the inter-dental open gingival embrasures, which act as retentive aids [Figure 4]. Satisfactory esthetics was also attained. Retention was further enhanced by the placement of the cast partial denture framework by the engagement of the proximal plates and the gingival approaching arm of the clasps [Figure 5].

Second modality - Soft liner gingival veneer integrated with acrylic partial denture

The case shown in Figure 6 presented with edentulous condition and generalized gingival recession. There were no adequate retentive aids for the gingival prosthesis, in the form of open gingival embrasures. Hence, the first modality, silicon gingival prosthesis, could not be proposed for this case. Retention for the gingival prosthesis could be obtained by integrating the prosthesis with the acrylic partial denture. Block out impression technique was followed for the accurate duplication of the inter-dental open gingival embrasures. A couple of impressions were made and two casts were acquired.

Wax-up of the gingival veneer part and partial denture part were done together over the first cast. The gingival veneer part alone was sectioned and held in reserve. The partial denture part alone was invested and actylic dentures were obtained. The labial flange of the denture was trimmed and segmented. The denture was placed on the second cast. The wax pattern of gingival venner part was placed back and

Table 1: Summary of gingival prosthesis modalities

Type of modality	Indications	Advantage
Modality 1 - Silicon gingival prosthesis	* Adequate retentive features available	- Good color matching and color stability
Modality 2 - Gingival veneer as part of RPD	* Lack of retentive features * Gingival veneer to be given as a part of RPD	- Gingival veneer and removable partial denture given in combination
Modality 3 - Flexible denture as gingival veneer	* Anterior teeth missing - edentulous space to be used as a retentive aid	- Gingival veneer and denture given in combination - Comparatively easier fabrication than the other two modalities

Figure 1: Patient 1 preoperative

Figure 2: Patient 1 Interdental block out with putty wedges

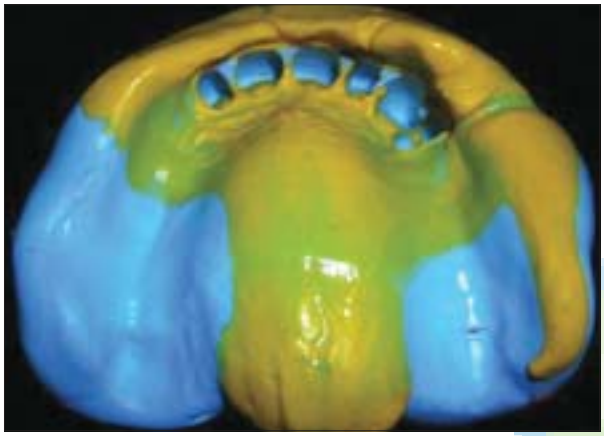

Figure 3: Patient 1 Impressions

Figure 4: Patient 1 post operative 1

Figure 5: Patient 1 Postoperative 2

Figure 6: Patient 2 preoperative

a final wax up was done. The pattern was invested and only the labial flange portion of the denture was replaced with soft liner.

Shade matching was done with the customized shade guide for both pigmented marginal gingiva and attached gingiva. An acrylic based soft liner (Permasoft Soft Liner) was used for the fabrication. This material is commonly used for the fabrication of intraoral stents. It maintains its resiliency for a period of five to six months. Hence the labial portion of the partial denture, along with the gingival prosthesis, should be replaced once in five months. The prosthesis was carefully retrieved from the mold, without distorting the flexible labial flange portion. Pigmentation was done with acrylic pigment colors selected according to the shade matching guide [Figure 7]. The prosthesis

was tried in the patient's mouth [Figure 8].

Third modality - Flexible partial denture as gingival veneer

The case shown in Figure 9 presented with Kennedy's Class IV type edentulous condition, with missing anterior teeth and generalized gingival recession. There were no adequate retentive aids for the gingival prosthesis in the form of open gingival embrasures. Retention for the gingival prosthesis could be obtained by utilizing the anterior edentulous section as a retentive aid in the form of a tooth supported partial denture. Since the occlusal forces were not of major concern in the anterior region, planning was done for a flexible partial denture with labial flanges that would act as gingival veneer.

Block out impression was made as discussed earlier and the cast was obtained. Wax pattern for the flexible denture was made and verified in the patient's oral cavity. Shade matching was done with the help of the customized shade guide.

The pattern was invested and flexible denture was processed with Permasoft Soft Liner. The prosthesis was retrieved. Pigmentation was done with acrylic pigment colors and the prosthesis was tried in the patient's oral cavity [Figure 10]. The prosthesis had to be replaced once in five months due to loss of resiliency

CONCLUSION

Three types of modalities of gingival prosthesis are recommended [Table 1]. Based on the accessibility to retentive features in the form of open gingival embrasures, the type of modality pertinent for any given circumstance can be chosen. The first modality of silicon gingival prosthesis is preferable whenever the retentive aids are available, because of the better surface finish, better shade matching and longer duration of allocation than the soft liners, which need to be replaced once in six months, owing to loss of resiliency.

REFERENCES

1. Woofter C. The prevalence and etiology of gingival recession. Periodont Abstr 1969;17:45-50.
2. Cronin RJ, Wardle WL. Loss of interdental tissue:

Figure 7: Patient 2 Prosthesis

Figure 8: Patient 2 postoperative

Figure 9: Patient 3 Preoperative

Figure 10: Patient 3 Postoperative

Periodontal and Prosthodontic solutions. J Prosthet Dent 1983;50:505-9.
3. Studer S, Naef R, Scharer P. Adjustment of localized alveolar ridge defects by soft tissue transplantation to improve muco-gingival aesthetics: A proposal for clinical classification and an evaluation of procedures. Quintessence Int 1997;28:785-805.
4. Hummert TW, Kaiser DA. Block out technique for impression of teeth with increased open gingival embrasures. J Prosthet Dent 1999;82:100-2.
5. Chalian NA, Philips RW. Materials in maxilofacial prosthodontics. J Biomed Mat Res 2004;8:349-63.

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