

Panacea to lost gingival tissue architecture and spacing: Silicone gingival prosthesis

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Abstract The positive psychological effects of improving patients' smile often contribute to an improved self-image and enhanced self-esteem. Periodontal disease may lead to tooth and tissue loss that can result in esthetic problems. Combined periodontal/prosthodontic treatment for patients with advanced disease is well documented. This case report illustrates a method of treatment for an advanced tissue loss in an esthetic area using a removable silicone gingival prosthesis/mask.

Key Words: Black triangles, gingival esthetics, gingival recession, silicone gingival prosthesis

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INTRODUCTION

Periodontal disease may lead to bone loss and soft tissue loss resulting in enlarged gingival embrasures and increased crown length causing esthetic problems.^[1-3] Selecting the best esthetic and prosthetic treatment for teeth with gingival recession in the anterior region may be challenging. In these situations, lip line, gingival line, and anatomic crown length are important factors for esthetic results.^[4]

Gingival replacement prostheses have historically been used to replace lost tissue, when other methods (e.g., surgery or regenerative procedures) were considered unpredictable or impossible. With relatively new method, in this case, large tissue volumes are easily replaced. Gingival prostheses take several forms, and many authors have described their uses and methods of construction.^[5-13]

Tissue replacement prostheses may be used to replace tissue lost because of periodontal surgical procedures, trauma, ridge resorption, or traumatic tooth extraction. From a prosthodontic point of view, restoration of these areas can be accomplished with either fixed or removable prosthesis.

Materials used for gingival prostheses include auto-cured and heat-cured acrylics, porcelains, composite resins, and thermoplastic acrylics, as well as silicone-based soft materials. This case report illustrates a method of treatment for an advanced tissue loss in an esthetic area using a removable silicone-based gingival prosthesis/mask.

CASE REPORT

A 25-year-old female patient visited the Department of

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Periodontology with the chief complaint of bleeding gums. She was diagnosed as a case of chronic-generalized periodontitis.

During preliminary periodontal phase, scaling and root planning were done followed by oral hygiene reinforcement, after 1 month of maintenance, patient was re-evaluated for periodontal pocket. It was found that pocket depth was 5 mm w.r.t. 14, 13, 12, 22, 23, and 24 and 7 mm with angular bone loss w.r.t. 11 and 21.

Presurgical medication was given 1 day before surgery and continued until 3 days after surgery, open flap debridement was done using Kirkland's flap, biograft was placed w.r.t. 11 and 21 followed by placement of interrupted suture, and patient was recalled after 1 week for suture removal.

After 3 months, patient was again re-evaluated for periodontal status and the amount of gingival recession. Gingival recession was classified as Miller's class III gingival recession [Figure 1].

The present condition could not be managed by periodontal therapy, as the patient was very much concerned about esthetics. A prosthodontics approach to mask the exposed surface and spacing by means of gingival prosthesis was considered.

Procedure

A preliminary impression was made with irreversible hydrocolloid impression material (Algitex, DPI, India) and was poured in type III dental stone (Dentstone, Neelkanth Healthcare Products, India). Over the preliminary cast, a sheet of modeling wax spacer was placed from upper right first premolar to upper left first premolar in such a way that it extends from the depth of the vestibule apically, onto the incisal surfaces.

Three relief stops were given one anteriorly on the incisal edge of central incisor, and two on both the occlusal surfaces of the first premolars acting as vertical stops during placement of the special tray.

A labial special tray [Figure 2] was then fabricated using an autopolymerizing clear acrylic resin, covering the wax spacer with a handle extending from the center of the tray, and the tray was checked in the patient's mouth for proper placement and removal.

To prevent impression material from flowing out of palatal aspect of the embrasures, silicone putty barrier [Figure 3] was formed on the palatal aspects of the teeth to be treated (Express, XT, Penta, Putty, 3M ESPE, India, Limited).



Figure 1: Intraoral view of the lost gingival architecture



Figure 2: Labial special tray extending from 14 to 24 with handle



Figure 3: Intraoral view of palatal putty barrier

Wax spacer was removed before final impression making, and the tray was perforated. Impression was made by double mix single impression technique using addition silicone impression material [Figure 4] (Express Putty and lightbody 3M ESPE US).

The impression was poured in type III dental stone (Dentstone, Neelkanths Healthcare Products, India) [Figure 5]. Proposed extension of the prosthesis was marked on the cast after assessment of patient's lip line and labial fullness. 1 mm thickness of modeling wax (Modeling Wax, Hindustan, India) was adapted on the cast, and the wax pattern of the desired shape and size was properly carved and finished [Figure 6]. Finished waxed up tried in the patient's mouth. After satisfactory try in, wax-up was resealed on working model.

Flasking and dewaxing was done such that it was embedded in plaster and reverse was formed in dental stone [Figure 7].

Then, the room temperature vulcanization (RTV) silicone was mix and shade matching was done with intrinsic silicone stains to mimic the patient's adjacent tissues to make it more esthetically pleasing, and then the mixed material is packed into the flask and allowed to set. After an overnight curing at room temperature and a short curing cycle at an elevated temperature of 74°C inside the hot water bath for 3 h, the mold was allowed to return to room temperature. The RTV silicone gingival prosthesis was then retrieved from the flask [Figure 8].

Finishing and polishing was done with Silicone trimming wheels.

The patient was advised to insert the prosthesis by placing it interdentally and pressing it in position [Figure 9]. The patient readily adapted to the prosthesis and was satisfied with the result. The follow-up for the prosthesis was done and checked for adaptation, plaque control, and cleanliness at each recall visit every month. Also, instructions were given to clean it every time after having food. The prosthesis was to be kept in water during night to prevent warpage of the prosthesis.

DISCUSSION

Gingival defects can be treated with surgical or prosthetic approaches. The original tissue contours can be mimicked with successful surgical treatment. The disadvantages of surgical approach include need for bone augmentation, surgical costs, healing time, discomfort, and unpredictability when large volume of tissue is missing. In such cases, prosthetic replacement is a more predictable approach for replacing the lost tissue architecture.



Figure 4: Final elastomeric impression



Figure 5: Master cast for wax-up



Figure 6: Wax-up for prosthesis



Figure 7: Flasking of waxed up prosthesis



Figure 8: Silicone gingival prosthesis

In contrast to a fixed prosthesis, a removable gingival prosthesis can replace a large volume of tissue without disturbing the other dental units and create an ideal tissue contour as well as esthetics with thorough oral hygiene maintenance.^[14]

Removable gingival prostheses can be made using different materials and methods of fabrication and should possess adequate retention to avoid displacement during mastication, speech, and soft tissue movements. Ideal tissue contours are waxed, processed, and then shade-matched to the adjacent tissues to provide an esthetically pleasing, functional restoration. The procedure is simple, noninvasive, economical, and less time-consuming for both the patient and clinician.

Removable veneers made from heat-cured acrylic had more color stability compared to silicone or co-polyamide materials which were prone to staining from tea and coffee. On the other hand, acrylic materials have the disadvantage of being hard, ridged, easy to fracture, and difficult to fit around teeth. In comparison, silicone base materials are flexible, have improved comfort and increased resistance to fracture.^[15]

This type of prosthesis has limitations. Retention may be difficult, and because of the inherent porosity of the silicone-based material, staining and plaque accumulation may be a problem.

The main drawback is that it requires reconstruction once every 6 months, as the prosthesis loses its physical properties such as color, flexibility and also dimensional changes are observed. Plaque control and cleanliness are of prime importance. Smoking and frequent drinking of tea or coffee are discouraged.

With advances in bonding agents and the development of pink ceramics and resin composite materials, it is possible to use gingival colored porcelain or composites over the root surface to eliminate black triangles as well as spacing in the present condition.^[16]



Figure 9: Intraoral view of the gingival prosthesis

CONCLUSION

This case report highlighted the fabrication of a sleek lightweight and flexible, removable type of silicone gingival prosthesis for the reconstruction of a large volume of lost gingival architecture while accomplishing adequate retention and finer esthetic results.

A removable gingival prosthesis/mask may be an alternative prosthetic procedure to treat advanced tissue loss achieving esthetic results and patient satisfaction at an affordable cost.

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Conflicts of interest

There are no conflicts of interest.

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