Esthetic Rehabilitation of Siebert’s Class II Case with Loop Connectors and Connective Tissue Graft
Byju Paul Kurian1, Manu Johns2, Jose Paul3, Seena Sam4, C R Karthikeyan5, Joe Mathew6

Contributors:
1Professor and Head, Department of Prosthodontics, Annoor Dental College and Hospital, Kerala, India; 2Assistant Professor, Department of Prosthodontics, Annoor Dental College and Hospital, Kerala, India; 3Professor and Head, Department of Periodontics, Annoor Dental College and Hospital, Kerala, India; 4Postgraduate Student, Department of Prosthodontics, Annoor Dental College and Hospital, Kerala, India; 5Reader, Department of Prosthodontics, Annoor Dental College and Hospital, Kerala, India; 6Consultant and Private Practitioner, Kerala, India.

Correspondence:
Dr. Kurian BP. Department of Prosthodontics, Annoor Dental College and Hospital, Kerala, India. Phone: +91 9447049455. Email: dr.byjupaulkurian@gmail.com

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Abstract:
Drifting of teeth to the edentulous area may reduce the available pontic space, whereas existing diastemata before an extraction may result in excessive mesiodistal dimension for the pontic. If implant treatment is not a feasible option, loop connector fixed partial denture (FPD) may be the simplest and best solution to maintain the diastemata and provide optimum restoration of aesthetics. A systematic approach is required to resolve esthetic problems predictably. Conventional fixed dental prosthesis can surrender to esthetic failure, which makes the clinician consider other treatment options. Implants may not be affluent considering the economical factor, conceding to FPDs for rehabilitation. In the present case report, loop connectors have been employed to project the spacing along with post-surgical gingival recontouring using the positive pressure technique to enhance the aesthetics. Anterior esthetic replacement with the loop connectors helps to maintain the diastemata with good aesthetic results. The patient was satisfied with the final outcome as the restoration achieved excellent form.

Key Words: Connective tissue graft, gingival contouring, loop connectors

Introduction
Esthetics have been the backbone of dentistry since the past two to three decades. The loss of anterior teeth is obvious for all patients unlike the posterior teeth. Dental implants, resin bonded bridges and conventional fixed partial dentures (FPDs) can be engaged for replacing missing teeth in the esthetic zone. However, an ideal treatment planning for every case may be beaten by the patient’s demand.

Pre-existing anterior spacing combined with extraction of any one of the teeth may result in excess space available for pontic. If space has to be maintained in restoration and implant is not a feasible choice, FPD along with loop connector is the next best treatment option. The FPD with loop connectors enhance the natural appearance of the restoration and help maintaining the spacing.

The appearance of the gingival tissues surrounding the teeth also plays a critical role in anterior aesthetics. The gingival perspective is concerned with the soft tissue envelope surrounding the teeth. Tissue graft surgeries may be essential to improve the aesthetic profile in edentulous spans prior to prosthetic rehabilitation.

The present article emphasizes the prosthetic rehabilitation of a partially edentulous patient with existing spacing between the anterior teeth and inadequate soft tissue envelope in pontic space. The gingival reconstruction and contouring of the defective area was followed by the prosthetic rehabilitation through loop connectors.

Case Report
A 49-year-old male patient reported to the Department of Prosthodontics for replacement of the missing maxillary left central incisor that was extracted 5 months back following endodontic failure (Figure 1). The right central incisor was endodontically treated 30 years back following a trauma and efforts towards prosthetic rehabilitation was nil. Recording of the patient’s history revealed existence of spacing between the upper six anterior teeth and he was keen on maintaining the same during the prosthetic rehabilitation. Hence a fixed dental prosthesis with loop connectors was planned to include both
the right and left maxillary central and lateral incisors. The maxillary lateral incisors were presented to have fair endodontic and periodontal prognosis.

The aesthetic zone portrayed a vertical soft tissue defect in relation to the missing left central incisor. To enhance the soft tissue contour, it was decided to harvest a connective tissue graft from the palate to rectify the defective area (Figure 2a).

To maintain the emergence profile, gingival contouring by provisional restoration using the positive pressure technique was intended with intermittent monthly follow-up and subsequently the definitive prosthesis after 3 months.

Correlating the findings of the clinical examination, study of the diagnostic models, photographic analysis, combined with esthetic evaluation, the following observations were noted:
1. Single anterior edentulous space
2. Existing spaces between the natural teeth
3. Endodontically treated right central incisor without periapical pathology
4. Unesthetic gingival contour (Siebert Class II).

A systematic interdisciplinary approach for treatment planning was initiated which included:
1. Gingival reconstruction by apposition of a connective tissue graft
2. Correction of unaesthetic gingival contour employing provisional restoration
3. Prosthetic rehabilitation utilizing the loop connector fixed prosthetic design.

Tooth preparation was carried out for the maxillary right central incisor and right and left lateral incisors, which was in conjunction with the Ante’s Law. The existing vertical soft tissue height was measured using a periodontal probe at the defective site and compared with the adjacent right central incisor region to evaluate the anticipated height of soft tissue reconstruction.

An alginate impression (Hydrogum 5, Zhermack, Italy) was made for the fabrication of a provisional restoration. On this cast, a mock-up of the connective tissue reconstruction was done. The provisional restoration with a sanitary pontic design for the proposed surgical site was then fabricated on the altered cast. Free connective tissue graft was then harvested from the palate of the patient, and subsequently soft tissue augmentation was performed to reconstruct the vertical defect (Figure 2b and c).

The sanitary pontic provisional restoration was cemented with quick setting provisional cement (Temp-Bond NE, Kerr) for the first three post-surgical days to facilitate optimum initial healing of the surgical site (Figure 3a).

Provisional restoration and the underlying sutures from the surgical site were removed on the third post-operative follow-up appointment. Subsequently an alginate impression was made and a cast was obtained. The gingival zenith of the pontic site was delineated using a graphite pencil (diameter of 0.4 mm) and then scored with a B.P. blade to appreciate the adjacent gingival contour. An immediate interim heat polymerized acrylic (Meliodent, Heraeus-Kulzer, Germany) provisional restoration with slight gingival over contouring was fabricated, disinfected and cemented (Figure 3b). The provisional restoration which was advanced with slow pressure demonstrated blanching in areas that constituted excessive augmented.

Figure 2: (a) Connective tissue graft harvested from the palate. (b) Graft sutured to the prepared bed. (c) Periosteal flap sutured over the graft.

Figure 3: (a) 3 days post-operative. (b) 10 days post-operative. (c) 2 months post-operative view.
tissue. The positive pressure technique was employed for the post-surgical gingival recontouring.3,4

The patient was reviewed weekly for 12 weeks, and periodontal maintenance therapy was done every alternative week. During this period of 12 weeks, the provisional restoration had conditioned and contoured the tissues favorably (Figure 3c). Once the desired tissue contour was achieved, definitive impressions were made. The casts were articulated following face-bow transfer, and the anterior guidance was established.

Partial coverage porcelain fused metal crowns with loop connectors were fabricated (Figure 4a and b). Try in was done and interferences were removed. After isolation, definitive restoration was cemented using Type-I Glass ionomer luting cement (Fuji, GC Corporation, Japan). Proper oral hygiene instructions were given. The patient was reviewed for the next 3 months at a regular interval of 2 weeks and the outcome was satisfactory (Figure 4c).

Discussion
Missing central incisor in a patient with generalized maxillary anterior spacing is a difficult esthetic problem to resolve with conventional FPD’s. Maximum esthetic results are obtained if the natural anatomic forms of teeth are protected.4 The modified FPD with loop connectors enhance the natural appearance of the restoration, maintain the inter-tooth spacing and preserves the remaining tooth structure of the abutment teeth.1 Connectors are the part of FPD that connect between retainer and pontic. They may be either rigid or non-rigid. Conventional FPD connectors are more rigid as compared to loop connectors. Loop connectors become more flexible and its flexibility depends on its lengths, diameter and its cross-section.5 The prosthesis design may cause difficulty in maintenance and may affect the phonetics especially linguopalatal sounds. However keeping the connectors round and small in size will not affect the phonetics.6

Positive pressure technique can invite ischemic blanching of tissues in the areas of pressure and can also hinder the placement of provisional restoration, but they are transitory in most cases.7 A well-controlled positive pressure produces only thinning of the epithelium and shortening of rete-peg without causing any inflammation.8

An appropriate gingival contouring with the aid of positive pressure technique using provisional restoration and subsequent prosthetic rehabilitation of the missing teeth by using loop connected fixed dental prosthesis could satisfy the patient both economically and aesthetically.

Conclusion
Implants, removable partial dentures, and conventional FPDs are different treatment options available to replace a single missing anterior tooth. This paper has described a conservative approach for anterior esthetic replacement with the loop connectors to help maintain the spacing with good esthetic results. The patient was satisfied with the final outcome as the restoration achieved excellent form.

Clinical significance
An interdisciplinary approach for maximizing the macro and micro-esthetic factors for the rehabilitation of combined soft and hard tissue defects can satisfy both the patient and the clinician. Edentulous anterior region with underlying soft and hard tissue defect in a patient with diastema can be treated with significant results. Connective tissue graft placement and subsequent pressure contouring will enhance the esthetic outcome when rehabilitating such patients with loop connectors.

References