

Successful Interdisciplinary Treatment Approach For Dental And Gingival Esthetic Rehabilitation: A Case Report

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Abstract: Attractive smile is a crucial concern of today's dentistry and the harmony of smile is determined not only by the shape, position and color of the teeth but also by the gingival esthetic features. This article describes an esthetic rehabilitation of a case with an interdisciplinary treatment approach (orthodontic, periodontic, Restorative Dentistry) to achieve the desirable esthetic outcome. At first, the patient received fixed orthodontic therapy to achieve the goals of space distribution. Crown lengthening by external bevel gingivectomy followed by the depigmentation procedure constituted the surgical phase of treatment. Finally direct composite technique was applied to improve the color, shape and alignment of the teeth.

Keywords: dental Esthetic, dental veneers, gingivectomy

I. Introduction

The demand for esthetic dentistry has never been greater.¹ Obviously the contemporary dental treatment does not just consider teeth to make them better for chewing, but also try to Supply the growing esthetic demands of today's dental patients.

The public is aware of the importance of a beautiful, natural-looking smile along with good function. Attractive smile is a crucial concern of today's dentistry and the harmony of smile is determined not only by the shape, position and color of the teeth but also by the gingival esthetic features.²⁻⁶ To achieve ultimate esthetic outcomes a greater collaboration for close interaction among all of the dental disciplines are necessary. An interdisciplinary approach among the restorative dentist, periodontist, orthodontist, and other specialties could lead the results of therapy to the patient's objectives and goals.^{7,8} In this case report we present an interdisciplinary treatment approach between various branches of dentistry to achieve the desirable esthetic outcome.

Case report:

A 29-year-old female with a chief complaint of black gingiva in upper jaw and unaesthetic smile was referred to the faculty clinics (figure1). The reported medical history was unremarkable. In primary evaluation, the teeth and gums were assessed visually. The patient had short teeth with uneven gingival margins, anterior diastema, high lip line, and generalized gingival pigmentation. The patient didn't receive any cosmetic dental treatment ever.

At first, irreversible hydrocolloid impressions of both maxillary and mandibular arches were taken, and diagnostic wax up was performed to make decision about the treatment plan. Moreover a panoramic radiography was requested. Following the design of treatment plan, the patient received fixed orthodontic therapy to achieve the goals of space distribution.

The MBT brackets (Orthodontic design and production Inc., USA) were bonded to the anterior and premolar maxillary teeth according to their related positions, wire Ni-Ti 16(Gestenco,Sweden) was inserted, then elastic chain (Orthotechnology, USA) was inserted between tooth #8 and #9, in order to move tooth #9 in mesial direction. The next session, a 16-22 Ni-Ti wire was inserted, push coil springs (Dentaurum, USA) were inserted between tooth #7 and #8 and between tooth #9 and #10, and closed coil spring inserted between tooth #8 and #9 to increase diastema between tooth #7 and #8 and between tooth #9 and #10.

The recall checks were carried out with one month intervals. The careful observation of teeth movements was fulfilled. After 1 week following the start point of orthodontic therapy, the patient was prepared for periodontal surgery. As the orthodontic brackets, wires and springs were not important obstacles regarding the periodontal surgery, we conduct the surgery as soon as the patient was prepared and content psychologically.

A complete medical history and routine blood tests were carried out to rule out any systemic contraindication for surgery. After necessary explanations for the patient about the surgical procedure, labial and palatal surface of the anterior segment of the upper jaw was anesthetized with infiltration injection (2% Lidocaine) The surgical template which was fabricated and sterilized previously was installed and the required gingival margins were marked. The bleeding points on the gingival surface created by the probe were taken as reference points for placing the external bevel incision.

In the first step, Crown lengthening by external bevel gingivectomy was completed by following the lines which was indicated by the surgical template.

The incision was made using a no.15 surgical blade from the attached gingiva to a level just apical to the bleeding points. The gingivectomy was followed by the depigmentation procedure. Surgical abrasion using large round diamond bur was performed to gently remove the entire pigmented epithelium along with a thin layer of connective tissue. A high speed handpiece and a # 6 round diamond bur under water spray was used over the epithelial layer until whitish connective tissue was exposed.

Hemostasis was obtained with sterile saline-soaked gauze which was pressured on the recipient site to control bleeding. The surgical area was covered with periodontal dressing for 1 week. After the surgery, patient received antibiotic (20 capsule Amoxicillin (Amoxicillin, Darupakhsh, Tehran, Iran) 500 mg 3 times a day) and Gelofen (20 pearls, 400 mg 4 times a day) for pain control if needed. The patient was advised to use chlorhexidine mouthwashes for the immediate two weeks postoperative period to aid in plaque control.

No post-operative pain, hemorrhage, infection or scarring occurred. Although mild inflammation at the right central and lateral incisor area was observed, healing was uneventful.

The area healed well after two weeks. Pigmentation was absent from the newly formed epithelium and it appeared red after 3 weeks. Upon final healing, the gingiva appeared pale pink, which was very satisfactory for the patient. Crown length was adequate and the patient was referred for restorative treatment.

The restorative procedure began after 6 weeks of surgical healing interval. Before the restorative procedure, the patient's upper arch was molded using an alginate material (Chromogel, Marlic, Iran) and poured with die stone. The dental cast was waxed so that a silicone index could be made and a plan of proposed esthetic treatment could be presented to the patient.

Once the silicone index was positioned, the direct restorative procedure began according to the protocol as follows.

At first, 0.5 mm-deep walls were prepared on the labial surfaces of the teeth, cervical borders of the preparations were arranged just at the same line of the gingiva by using a tapered diamond bur (teeskavan, Iran). Then, Isolation of the operative field with insertion of a gingival retraction cord and Teflon tape was conducted. For distal and mesial sides of the tooth #7, transparent matrix bands were sized up, cut and fixed with proper wedges. 37% phosphoric acid (Star Etch, Scheftner, Germany) was applied on the enamel surfaces for 30 seconds, rinsed with water spray for 30 seconds and dried slightly. One-bottle bonding agent (Adper Single Bond, 3M ESPE, USA) was applied in two layers on the prepared tooth surfaces. The adhesive was light cured for 20 seconds), and the tooth was built with composite resin, shade A2 and A3 (Gradia Direct Anterior, GC, Japan) by employing the incremental technique. Finally, finishing and polishing procedures were performed by using a yellow-banded knife-edge bur (Teeskavan, Iran) in combination with a high-speed handpiece (NSK Pana Air, Japan). After all, the polishing discs (Sof-lex, 3M, USA) from coarse to fine grits were used to accomplished the procedure.

In this step, the reactive layer of composite resin was removed to avoid bonding with the contact area of the adjacent teeth to be restored. After this stage, the same procedures were accomplished for tooth #10, #8 and #9 respectively.

II. Discussion

There have been various reports of successful morphologic and esthetic changes after direct composite restorative treatment in patients with unaesthetic smile.^{9, 10} in the other hand there are several reports regarding the soft tissue esthetic interventions.¹¹⁻¹³ however, few reports have described the outcomes of an interdisciplinary treatment approach between various branches of dentistry to achieve

the desirable esthetic outcome.^{1,7,8,14} In this case, the patient had short teeth with uneven gingival margins, anterior diastema, high lip line, and generalized gingival pigmentation.

This type of esthetic problem is a great challenge to clinicians providing the proper treatment because of the degree of complication and variety of the involved tissues. Thus we designed an interdisciplinary treatment plan involving orthodontic therapy, periodontal plastic surgery, restorative rehabilitation and a strictly supervised oral hygiene program. This interdisciplinary approach resulted in patient satisfaction and improved her self-confidence.

III. Conclusion

Patient treatment with an interdisciplinary approach can result in a good esthetic, function, and patient satisfaction.

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Image 1: Preoperative view of the patient with an anesthetic smile as her chief complaint

Image 2: Preoperative Facial view of the dentogingival complex showing the short teeth with uneven gingival margins, anterior diastema and generalized gingival pigmentation.

Image 3: Facial view of the dentogingival complex, 1 week after crown lengthening and depigmentation procedure

Image 4: Final Facial view of the dentogingival complex

Image 5: postoperative view of the patient with a desirable smile

Image 1:



Image 2:



Image 3:



Image 4:



Image 5:

