
SUMMARY

In the analysis of characteristics of a pleasant smile, a gummy smile has negative effects. A 25-year-old female patient was referred to the Marmara University, Faculty of Dentistry, Department of Prosthodontics. On the basis of radiographic, cephalometric and oral examinations, the patient was diagnosed with Class II skeletal malocclusion, high angle facial profile and partially edentulous. There was a severe aesthetic problem in the anterior maxillary segment because of high lip line and an excessive vertical growth of the maxillary anterior jaw. A surgical approach was performed and excessive bone in the maxillary anterior region was removed after extraction. 9 implants (SwissPlus, Zimmer Dental, Carlsbad, CA, USA) were inserted in maxilla and 8 implants in the mandible. The stability of the implants was evaluated by the resonance frequency analysis. After prosthodontic treatment, the patient was recalled up to 5 years. The implants were successful and patient satisfaction was high.

Keywords: Implants; High Lip Line

CASE REPORT (CR)

Introduction

In the analysis of characteristics of a pleasant smile, a gummy smile has negative components, which most affects aesthetics of non-verbal communication. The nature of a high smile line can be: dento-gingival, connected to an abnormal dental eruption, which is revealed by a short clinic crown; muscular, caused by hyperactivity of the elevator muscle of the upper lip; dento-alveolar (skeletal), due to an excessive protuberance or vertical growth of the jawbone (maxillary); lastly, a mixed nature, in the presence of more than 1 of the above described factors. Location of the lip during speaking, smiling, and at rest is of key importance in treatment planning for missing teeth in the aesthetic zone. Orthognathic surgery, orthodontic therapy, maxillary and mandibular overlay removable partial dentures and fixed partial dentures could be treatment alternatives for patients with mixed dental and skeletal malocclusions. In this study, surgical approach was performed in a female patient with gummy smile, and excessive bone in the maxillary anterior region was removed. The patient was treated with implant retained fixed partial dentures, and an aesthetic outcome was improved.

Case Report

25-year-old female patient was referred to our clinic for evaluation. Her chief complaints were aesthetic and functional deficiency. Cephalometric, panoramic and periapical radiographs were taken and Rickett’s cephalometric analysis was completed. There was severe aesthetic problem in the anterior maxillary segment because of the high lip line. On the basis of radiographic, cephalometric and oral examinations, the patient was diagnosed with Angle Class II occlusion and high angle (Figs. 1 and 2). Intraoral examination revealed that several teeth were lost as a result of poor endodontic therapy and periodontal disease. There was an excessive protuberance and vertical growth of the maxillary anterior jawbone. The patient's oral hygiene was poor. The temporomandibular joint was asymptomatic and associated muscles were not painful. The remaining dentition included 8 maxillary teeth (right lateral incisor, right canine, right first premolar, third molar, left canine, left first and second premolars, left third molar) and 4 mandibular teeth (left canine, left first premolar, left second and third molars).

Several different restorative options were discussed with the patient, ranging from maintaining the existing
dentition to extraction of the remaining maxillary and mandibular teeth. The patient expressed a desire to keep as many of the remaining teeth for as long as possible. In the maxillary and mandibular arches, the use of a fixed partial denture was contraindicated because of the extensive tooth loss. Therefore a decision was made to insert implants in the posterior edentulous parts.

![Figure 1. Extraoral view before treatment at rest position](image)

The maxilla and mandible were prepared with a chamfer finish line and provisional restorations were performed and used for 2 weeks. The patient was unsatisfied with the aesthetic outcome in the maxillary anterior region, so it was decided to extract all the remaining maxillary teeth. A surgical approach was performed and excessive bone in the maxillary anterior region was removed after extraction. 4 implants were inserted in the maxillary anterior region in harmony with the lip line. The third molars in the maxilla and left mandible were extracted and the vertical dimension was decreased. Mandibular left canine and left first premolar were extracted because of periodontal tissue loss and 2 implants were placed.

The patient was referred for prosthetic rehabilitation following 3 months to allow for osseointegration and full maturation of the soft tissue. Diagnostic casts and record bases were fabricated and then mounted in an articulator (Artex; Girrbach Dental GmbH, Pforzheim, Germany). Metal ceramic restorations (VMK-95 Metal Keramik; Vita Zahnfabrik, Bad Sackingen, Germany) were fabricated (Figs. 3 and 4) and cemented with glass ionomer cement. After prosthodontic treatment, the patient was recalled 3, 6, 12 and 24 months later. The implants were evaluated by clinical and radiographic parameters.

The operation was done under general and local anesthesia. 5 implants (SwissPlus, Zimmer Dental, Carlsbad, CA, USA) were placed in the maxilla and 6 implants were placed in the mandible. The stability of the implants was evaluated by the resonance frequency analysis (Osstell, Integration Diagnostics, Savedalen, Sweden) test during the osseointegration period of 8 weeks. The diagnostic models were examined in the articulator and it was decided to make temporary restorations in the ideal occlusion. All the teeth in maxilla and mandible were prepared with a chamfer finish line and provisional restorations were performed and used for 2 weeks. The patient was unsatisfied with the aesthetic outcome in the maxillary anterior region, so it was decided to extract all the remaining maxillary teeth. A surgical approach was performed and excessive bone in the maxillary anterior region was removed after extraction. 4 implants were inserted in the maxillary anterior region in harmony with the lip line. The third molars in the maxilla and left mandible were extracted and the vertical dimension was decreased. Mandibular left canine and left first premolar were extracted because of periodontal tissue loss and 2 implants were placed.

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![Figure 2. Intraoral view before treatment](image)

![Figure 3. Extraoral view with provisional restorations at smile position](image)

![Figure 4. Location of implants at surgery](image)
The patient’s comfort with the decreased interocclusal dimension and the patient satisfaction was high at 24 month evaluation. The patient was very satisfied with the aesthetic outcome (Figs. 5 and 6). In this case there were no complications after implant placement. Evaluation of clinical parameters 5 years after final prosthodontic treatment demonstrated stable attached gingiva around the implants. Radiological evaluation demonstrated that peri-implant bone loss was in the clinically acceptable levels.

Discussion

The diagnosis of gummy smile must be precocious and based, with reference to specific parameters, upon a careful analysis of the etiopathogenetic factors and the degree of seriousness of the alteration. A correct treatment plan must contemplate the possibility of an orthodontic, orthopaedic and/or surgical therapeutic solution considering the seriousness and complexity of the gums exposures in connection with age of the subject1. In this case, at first, the remaining teeth were not extracted according to the wish and expectation of the patient, but the aesthetic outcome with the provisional restorations was not satisfactory; so, a surgical approach was preferred - to remove the excessive bone in the anterior maxilla.

References


Correspondence and request for offprints to:
Burçin Vanoğlu
University of Marmara
Department of Prosthodontics
Büyükçiftlik Sokak, No: 6 Güzelbahçe, 34365, Nişantaşı
Istanbul, Turkey
E-mail: drburcinakoglu@hotmail.com