ABSTRACT

Bone and soft tissue loss are common problems after loss of tooth and that can lead to excessive length of clinical crowns. In large amount of bone loss, a number of graft materials have been used in vertical and horizontal ridge augmentation to enable implant placement in optimal positions. Autogenous block grafts from intraoral or extraoral regions have been used with positive results. Allograft blocks with cortical bone are also used for ridge augmentation. In this case report a 21-year-old male patient with maxillary and mandibular bone loss due to traffic accident was rehabilitated. An allograft block was used for horizontal and vertical augmentation of the maxilla and mandible. The observed increase in ridge width allowed subsequent implant placement after a 5 month healing period. After 4 months from placement of the implants, implant-retained fixed prosthesis was performed

Key Words: Implant, traffic accident, bone loss

ÖZET

Diş kaybından sonra kemik ve yumuşak doku kaybı en sık görülen sorunlardan biridir ve yapay dişlerin boyunun normalden uzun yapılması neden olur. Büyük miktarda kemik kaybında, implantı uygun poziziyonda yerleştirmek için vertikal ve horizontal sırtların yükselttilmesinde bir miktar greft kullanılabılır. Ağrı içi ve diş bölgesinden alınan otojen blok greftler olumlu sonuçlar vermektedir. Allogreftler ise genellikle, kemik sırt yükseltme amacı ile kullanılır. Bu vakada trafik kazası sonucu maksiller ve mandibular kemik kaybına uğramış 21 yaşındaki hastanın tedavisi anlatılmaktadır. Maksilla ve mandibulayi yükseltmek için bir allograft kullanılmıştır. 5 aylık iyileşme süresince sonra kemikte yeterli oluşum sağlanmış ve implantlar yerleştirilmiştir. 4 ay sonra implant üstü protezler yapılmıştır.

Anahtar Kelimeler: Implant, trafik kazası, kemik kaybı

INTRODUCTION

Providing maxillofacial prosthetic treatment for patients with congenital and craniofacial defects should not only address physical and functional deficiencies but, ideally, should also evaluate the possible psychological effects of these deformities. The main reason for the bone loss, especially in the mandible, is generally the resorption depending on aging or because of unfavorably balanced prosthesis, but tumours and traumatic injuries are also among the reasons of severe mandibular bone loss.1,2,3

Dental implants are a biologically compatible and predictable treatment modality for both partial...
and complete edentulism. The predictability of dental implants is also accepted in the rehabilitation of maxillofacial defects. Defects that are congenital or acquired by trauma and ablative tumor resection surgery can result in significant esthetic deformities and functional disorders, and may result in psychological sequelae.

In many cases due to trauma, loss of bone volume from periodontal disease, neoplasms, or long-term edentulism, alveolar ridge augmentation is necessary for proper positioning of implants. Especially, the severe postoperative tissue loss by the total or partial resection of the mandibula, owing to the malign and benign tumors, leads to some difficulties in prosthodontic process, both for the patient, such as reduced stability, insufficient retention, impaired load bearing capacity, and for the clinician, such as establishment difficulties.

The incapacitating nature of the defect makes the reconstruction of the maxilla and mandibula challenging. The primary goal of reconstruction is to restore the structural integrity and continuity lost as a result of maxillary and mandibular defects, including an alveolar ridge with appropriate dimension and form.

Extensive soft and hard tissue loss usually requires an implant-supported or retained prosthesis to obtain adequate facial support and restoration of oral functions. Rehabilitation of oral function can be accomplished with the placement of endosseous implants to support dental prostheses with improved stability and retention. The purpose of this report is to present esthetic and functional reconstruction of a patient with maxillary and mandibular bone loss due to traffic accident using an implant-supported fixed partial denture (FPD) in combination with 4 maxillary and 6 mandibular implant-supported, cemented, metal-ceramic crowns.

**CASE REPORT**

A 21-year-old man with a surgically reconstructed mandibular and maxillary traffic accident defect was referred to the Department of Prosthodontics. The patient’s history revealed that a number of reconstructions had been previously performed involving hard and soft tissue(Figure 1). The medical history did not reveal any conditions that would compromise periodontal treatment and the patient was a nonsmoker. A comprehensive examination was done to determine the periodontal status of all teeth. Probing depth, bleeding sites, and mobilities were within normal limits. In clinical and radiographic evaluation, mandibular right first molar, first and second premolar, canine and central and lateral incisors had been previously extracted. The mandibular left root of second premolar, maxillary lateral incisors’ roots and mobil canine teeth were extracted. Also, the bone loss was determined in mandibular and maxillary anterior region.(Figure 2)

![Figure 1](image1.png)

Figure 1. a-Reconstructions of hard and soft tissue before implant and prosthetic therapy, b- the bone loss of maxillary anterior buccal region, c,d,e,f- Mandibular and maxillary implant placement

![Figure 2](image2.png)

Figure 2. a,b-Casting individual abutments, c,d,e,f-Definitive restorations

Three different treatment plans were considered: a cement-retained FPD, a bar-retained removable partial denture supported by 6 implants, and a screw-retained FPD for the mandibula. The patient was informed about clinic and laboratory procedures of three definitive prosthodontic treatment. The patient importuned implant supported fixed partial denture. Due to high-cost of screw-
retained FPD, consequently, the option of a cement-retained FPD for the mandible and maxillary anterior region was selected.

Written informed consent was obtained before the surgery. Following exraction, the reconstruction of these regions had been accomplished formerly via bone grafting with allograft. After a 5 month healing period, four internal implants (BioHorizons Implant Systems Inc, Birmingham, AL) were inserted maxilla, which were 3.5 mm in diameter and 15 mm and 12 mm in length. Five tapered internal implants and one internal implant were inserted in the mandibula which were 4.6 mm, 3.8 mm and 3.5 mm in diameter and 15 mm and 12 mm in length (Figure 3). The implants were left in place for 4 months, then the site was re-entered to uncover the implant cap and those placed distally; gingival healing cuffs 3 mm in height and 3.5 mm and 4.5 mm in diameter were placed. The soft tissue was then allowed to heal for two weeks before starting the planned restorations.

Despite many esthetic and functional surgical treatment of soft and hard tissues, mandibular vertical height was unsatisfactory. Therefore, standart prefabricated abutments could not be used. Plastic transfer copings (BioHorizons Implant Systems Inc, Birmingham, AL) 12 mm height were used to provide casting individual abutments (Figures 4,5). The healing abutments were removed, plastic transfer copings were attached to mandibular implants. Standart prefabricated abutments were attached to maxillary implants. Impressions of both arches were taken using polyether impression material (Impregum Duo Soft, 3M ESPE, Seefeld, Germany). After the impressions were removed, plastic transfer copings and standart prefabricated abutments were removed and attached to implant laboratory analogues (BioHorizons Implant Systems Inc, Birmingham, AL), then were placed to the sockets into the impression. Silicone-based resilient lining material (Ufi Gel, Voco, Cuxhaven, Germany) was placed around the cervical portion of the analogues. Type IV improved dental stone (FUJIROCK EP, GC America Inc. USA) was poured into the impressions to obtain final casts. The individual abutments were cast by laboratory technician. Metal-ceramic fixed partial dentures were fabricated. Final casting and prefabricated abutments were screwed to maxillary and mandibular implants. Metal-ceramic restorations were adjusted and were cemented by zinc polycarboxylate cement (Adhesor Carbofine, SpofaDental, Czech Republic) (Figure 6).

DISCUSSION

When significant trauma or surgery causes serious difficulty in solving esthetic or occlusal problems, the use of an implant-supported removable or fixed partial denture may be beneficial. The main goal in the prosthetic rehabilitation of the mandibula with severe atrophy or large bone defect is to establish such a prosthesis that ensures full patient satisfaction, as well as ease of cleaning ability. In this case report, an alternative treatment to the implant supported fixed partial denture might be a mandibular removable partial denture over the implant abutments, but the patient persistently refused to use such a prosthesis. Feine et al noted that patients' attitudes should be considered when the design of a prosthesis was being planned for an individual patient; so constructing an implant supported fixed partial denture was chosen, as mandibular and maxillary anterior regions with bone defect could be reconstructed. Maintenance of the prostheses and implants to be constructed was the most important factor for selecting the type of treatment.

An other possible treatment option could be fabrication of a screw-retained metal-acrylic FPD supported by 6 implants and it would have been the most acceptable treatment option. The patient could have more easily maintained hygiene with this type of restoration. However, high-cost of screw-retained FPD impeded such a treatment. Acceptable placement of mandibular and maxillary implants enabled that a cement-retained FPD for the mandibular and maxillary anterior region could be used.

The surgical decision to reconstruct, augment, or perform osteoplasty should depend primarily on, and be dictated by, the desired prosthetic result. The diagnostic arrangement is critically important, as the definitive prosthesis, the number and location of ideal implant sites, and the occlusal scheme must be selected before surgery. In this clinical situation, detailed presurgical planning and evaluation would have minimized the difficulty of the prosthetic rehabilitation. It is important to control implant occlusion within physiologic limit and thus provide optimal implant load to ensure a long-term implant success.
SUMMARY
This clinical report details the clinical evaluation of a 21-year-old man with a mandibular defect due to traffic accident and surgical-prosthetic rehabilitation using an implant-supported cement-retained FDP. Despite the limitations imposed by implant malposition, the esthetic and functional demands of the patient were fulfilled by this prosthetic rehabilitation. The importance of detailed prosthetic planning and evaluation before implant surgery is emphasized.

REFERENCES