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AUTHORS: Murat İnancı CENGİZ,Seda CENGİZ,Nihan ATALAY,Nurol ARIK

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# Outcome of Implants in Kidney Transplant Patient Undergoing Immunosuppressive Therapy: Case Report

## İmmünoşüpresif Tedavi Gören Böbrek Nakli Hastasında İmplantların Sonuçları: Olgu Sunumu

### ABSTRACT

Since the beginning of oral implant surgery, it has been recommended to exclude certain patients with systemic health problems from implant therapy. Although many studies have been done about the effect of systemic disease like diabetes and osteoporosis on implant success but there wasn't enough data about the effect of organ transplantation and immunosuppressive therapy on implant success in the literature. As the success rate of organ transplantations increased, the number of patients on immunosuppressive treatment increased. It has been reported in the literature that organ transplant patients undergoing immunosuppressive therapy may experience periodontal side-effects such as gingival overgrowth and implant failure. In our case 10 year of implant success was examined on the patient who are exposed to kidney transplantation 8 years ago and who takes cortisone and immunosuppressive.

**Key words:** Oral implant surgery, Immunosuppressive treatment, Organ transplantation.

### ÖZ

Oral implant cerrahisinin başlangıcından bu yana bazı sistemik sağlık problemlerine sahip hastalarda implant tedavisi önerilmemektedir. Diyabet ve osteoporoz gibi sistemik hastalıkların implant başarısına etkisi ile ilgili pek çok çalışma yapılmasına rağmen organ transplantasyonu ve immünoşüpresiflerin etkileri konusunda literatürde yeterli bilgi bulunmamaktadır. Başarılı organ transplantasyonlarının gerçekleşmesiyle immünoşüpresif tedavi gören hastaların sayısı artmıştır. İmmünoşüpresif tedavi alan transplantasyon hastalarında gingival büyümeler, implant başarısızlıkları gibi periodontal yan etkilerle karşılaşılabilceği bildirilmiştir. Olgumuzda 8 sene önce böbrek transplantasyonu geçirmiş, kortizon ve immünoşüpresif kullanan hastada 10 yıllık implant başarısı incelenmiştir.

**Anahtar sözcükler:** Oral implant cerrahisi, İmmünoşüpresif tedavi, Organ transplantasyonu.

Murat İnanç CENGİZ<sup>1</sup>

Seda CENGİZ<sup>2</sup>

Nihan ATALAY<sup>3</sup>

Nurol ARIK<sup>4</sup>

<sup>1</sup> Department of Periodontology, Faculty of Dentistry, Bülent Ecevit University, Zonguldak, Turkey

<sup>2</sup> Department of Prosthetic Dentistry, Faculty of Dentistry, Bülent Ecevit University, Zonguldak, Turkey

<sup>3</sup> Periodontolog, Pricate Implant Academy Clinic, İstanbul, Turkey

<sup>4</sup> Department of Nephrology, School of Medicine, Ondokuz Mayıs University, Samsun, Turkey

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### INTRODUCTION

In medically healthy patients, the success rates of some dental implant systems have reported to be between 90 and 95% at 10 years. In fact, it has been suggested that some local and systemic factors could represent contraindications to dental implant treatment (1). The use of immunocompromise after organ transplantation has been generally regarded to be a contraindication for dental implants in these patients due to possible early failure (impaired healing) or oral infections due to the fragile immunologic system, and this uncontrolled late healing of the wound and oral infection could

### Corresponding Adress/İletişim Adresi:

Murat İnanç CENGİZ  
Bülent Ecevit Üniversitesi Diş Hekimliği  
Fakültesi, Periodontoloji Anabilim Dalı,  
Zonguldak, Turkey  
E-mail/E-posta: dtinanc@mynet.com

ruin the transplanted organ and even be fatal (2,3). Also the bone metabolism disorders have been reported as a consequence of immunosuppressant therapy (4-8). This undesirable impact of the immunosuppressive drugs on the process of healing of bones around implants was confirmed in animals (9).

In fact the number of immunocompromised patients is increasing as a consequence of successful organ transplantation (10,11). Also in preparation for transplantation procedures, the patients must have all potential sources of inflammation removed, so in the course of dental treatment, most often to heal the oral cavity, they have numerous teeth extracted, thus leading to vast denture losses, and after successful transplantation they need to rehabilitate their masticatory system (12). That is why the replacement of missing teeth with the use of dental implants would be of such great importance, and at the same time only a few studies on this topic have been reported, with all of them showing the dental implant success rates in transplant patients to be similar to those in healthy subjects (1,2,11,12). The following case report describes the placement of dental implants in a kidney transplant patient.

## CLINICAL REPORT

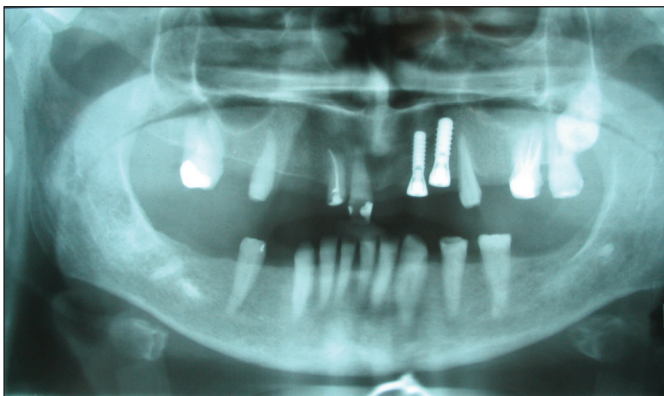
A 54 year-old female was referred to the Department of Prosthetic Dentistry Faculty of Dentistry Bülent Ecevit University in Turkey, with lack function of teeth. In her medical history appeared that she underwent kidney transplantation 10 years ago. She has been receiving immunosuppression since the transplantation, immunosuppression included cyclosporine and prednisolone. The

patient's request was a fixed partial dentures (FPDs), but there was no enough supporting teeth for FPDs. After consulting a nephrologist, and after radiological study two dental implants were planned to insert in the regions of 22 and 23 teeth. Radiologic measurements revealed that there was enough bone to insert two implants: the first in 22 tooth region with 3.3 mm in width and 12 mm in length, and the second in the region of 23 tooth with 4.1 mm inn width and 12 mm in length. Surgical stent was made from self-curing acrylic resin to ensure that the implants will insert in the desired positions (10).

One hour before surgery 600 mg of klindamycin was given to patient. The surgical mucoperiosteal flap was designed to provide a clear vision and preserve the dental papilla, then two implants (ITI Straumann) were inserted successfully as desired, with at least 1 mm of bone covering the buccal and palatal sides of implants which were clinically stable after insertion (Figure 1). Then the mucoperiosteal flap carefully adapted around the healing abutments and sutured, the prophylactic antibiotic continued for 5 days, and 0.2% chlorhexadine used as a mouthrinse for 10 days.

After 5 months of implantation (Figure 2) the steps of prosthetic restoration was started, and one implant required angled abutment. Finally functional loading of implants was done by metal-ceramic FPDs (Figure 3). The patient was recommended to use proximal brushes and dental floss. The patient was satisfied with cosmetic and functional results (Figure 3,4).

After functional loading of implants; clinical monitoring of the implants was performed and clinical parameters were recorded immediately after prosthetic loading, at



**Figure 1:** Oral panaromic radiography.

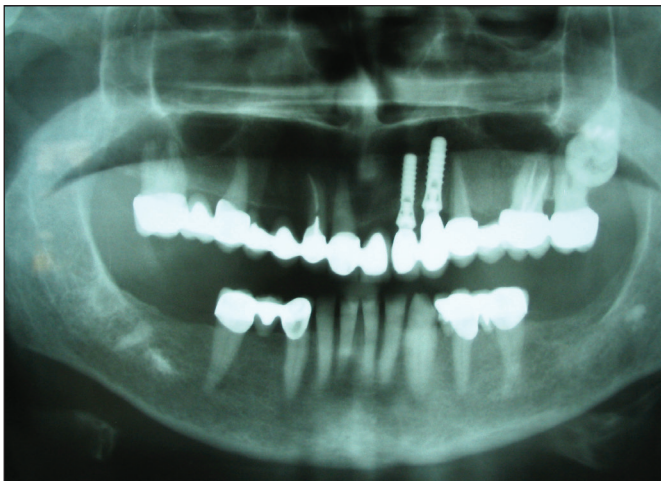


**Figure 2:** Postop view after 1 month of insertion.



3, 6, 12, 24, and 36 months after loading. The clinical examination involved: evaluation of the peri-implant mucosa for any signs of inflammation (redness, swelling, or bleeding on probing), along with percussion and manual manipulation to check for implant and prosthesis mobility and pain. Panoramic radiographs were used for the evaluation of periimplant radiolucency, the radiographs were taken at the same times of clinical examinations.

After 2 years of insertion the two implants (1.5 years of functional loading), the radiographic analysis showed a good contact between the bone and the implant surface which means existence of adequate osseointegration without any peri-implant radiolucencies (Figure 3). In clinical examination there was no pain, discomfort, infection or mobility in the implants. The attachment



**Figure 3:** Panoramic radiography after 2 years of function.



**Figure 4:** The patient's esthetic and functional expectations were satisfied.

level (AL) was between 2.9 and 3.3 mm and probing depth (PD) approximately 3 mm.

Gingival enlargement was seen around one implant, and bleeding index BI values indicated to presence of inflammation (Figure 5). Biopsy was taken for histological examination which showed increasing in the ground substance of connective tissue, inflammation in different levels, thickening of epithelium and elongated rete pegs (Figure 6).

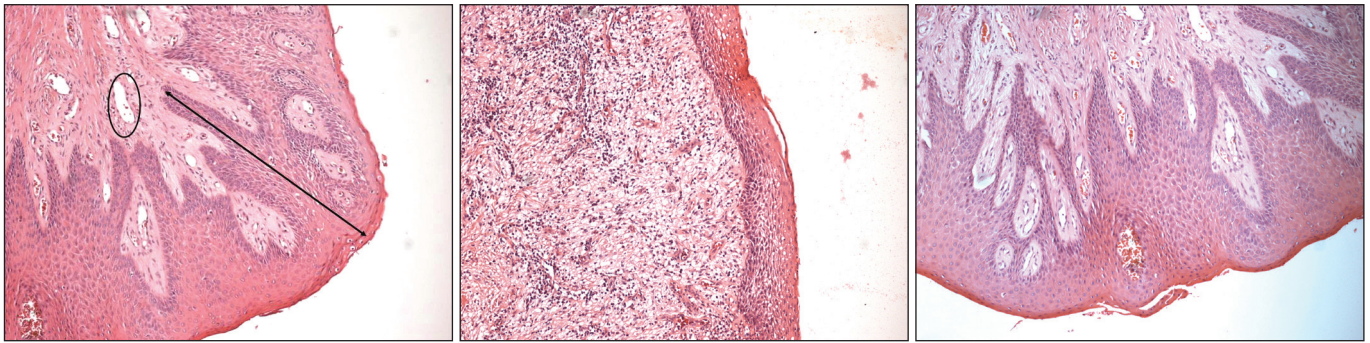
So during the 10 year follow up period, no implants were lost and none were mobile. The patient did not complain about the implants and prosthesis, she was pleased with her improved mastication (Figure 7).

## DISCUSSION

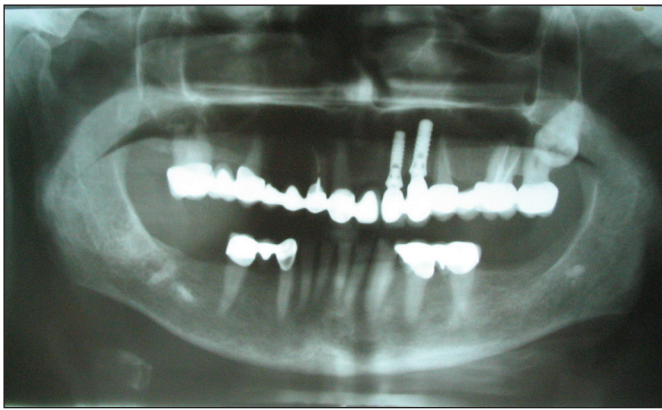
As a result of the evolution of transplantation and transplant immunology (immuno-suppressive drugs) the transplantation of vascularized organs has become an effective method of treating patients with end-stage organ failure, and thus an increasing number of patients undergoing transplantation of organs and tissues, there is a growing need to implement regular dental care especially the dental implants (13). Most of these patient have numerous teeth extracted before transplantation because the chronic renal failure and dialysis results in the exacerbation of dental caries indices, aggressive periodontitis, dry mouth and xerostomia, and in preparation for transplantation procedures, the patients must have all potential sources of inflammation removed (12,13). But the use of



**Figure 5:** Gingival enlargement due to CsA.



**Figure 6:** Histologic view of gingival enlargement mag: x100, x200, x400 respectively.



**Figure 7:** Panoramic radiography after 10 years.

immunocompromise after organ transplantation has been generally regarded to be a contraindication for dental implants (2,3). Pre-clinical studies have shown that use of immunosuppressive drugs reduces bone density and also impairs healing of vascularized allografts and dental implant osseointegration (14,15). Also bone metabolism is significantly altered by chronic exposure to glucocorticoids, chronic exposure to glucocorticoids constituted the most common cause of secondary osteoporosis, mainly affecting trabecular bone (16).

Although all of that, publications describing cases of therapies which used implants among organ transplant recipients appeared, and the follow up of the dental implants in transplant patients showed an acceptable results near to those in healthy persons, and showed that it is possible to place dental implants in patients in the course of their long-term immunosuppressive therapy following organ transplants (17,18,19,20). so the result appeared in this case report agree with results of previous publications.

Although the molecular mechanisms for the immunosuppression caused by CsA have been investigated, the

precise mechanism of action of CsA on bone is not clear (3). Mc Cauley et al have shown that CsA has no detrimental effect on cell viability (21). In addition, Buchinsky et al reported that the direct effect of CsA on circulating calcitropic factors or any of its direct effects on bone cells are insufficient causes for the bone loss (22). In addition, the immuno-suppressant have been altered considerably, and became less toxic toward the bones (18,20). Also using prophylactic antibiotic therapy and chlorhexidine mouthrinse, in addition to untraumatic surgical procedure may be played a significant role in prevent complication in this case and in previous published cases.

Gingival hyperplasia is most frequently observed in patients treated with cyclosporine. The mechanism of hypertrophy after application of CsA is still unknown. It is believed that CsA affects the fibroblasts, increasing their proliferation, as well as other extracellular factors. This suggests a significant role of dental plaque, in which CsA can accumulate (13,23, 24 ).

So as previous publications had showed, it is possible to place dental implants in patients with long-term immunosuppressive therapy following organ transplants, but this subject needs further and more extensive research.

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