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Case Report

Implant treatment followed by living donor lung transplant: A follow-up case report



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ABSTRACT

Patients: Dental implant treatment in patients with complicated systemic disease has been discussed, especially in the context of achieving osseointegration. However, some patients with no pre-existing systemic disease develop it later, during their implant maintenance periods. Organ transplants, and the lifelong administration of immunosuppressants that follows, are also of relevance to post-implant oral health. Thus, strategies to maintain the health of peri-implant tissue in these patients should be considered. Here, we present the case of a patient receiving a living-donor lung transplant during her implant follow-up period. The condition of the lung is affected by that of the oral cavity, so the maintenance is of utmost importance. Throughout the follow-up period, we provided periodical professional maintenance care.

Discussion and conclusion: The patient experienced no complications, alterations in her radiographic findings, or worsening of periodontal indices, despite being extensively medicated with immunosuppressants, steroids and bisphosphonate.

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1. Introduction

Since its inception over forty years ago, implant treatment is rapidly becoming the most important treatment modality for edentulous patients. Several attempts being made to expand this field such as immediate loading, immediate implant placement after extraction and implant-related bone regeneration/expansion [1–3] are gaining momentum as promising evidence-based treatment protocols.

As the field of implant dentistry widens, it is more likely to encounter patients with severe systemic disease. However, the predictability of implant characteristics and, ultimately, success in patients experiencing systemic disease has not yet been fully discussed. Organ transplant therapy, an extreme therapeutic response to irreversible systemic disease, is necessarily accompanied by a lifelong regimen of immunosuppressant medication. Because there is a strong interplay between immunosuppressants and oral and systemic health, the effects of this therapy on oral hygiene

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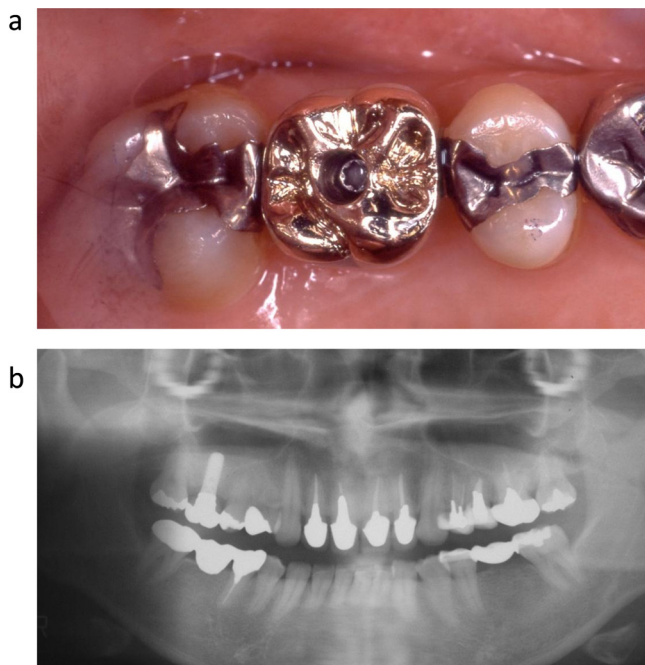


Fig. 1 – At the time of superstructure delivery. (a) Occlusal view and (b) panoramic radiograph.

indices and radiographic findings of the implant may demand attention.

The relationship between implants and immunosuppressive therapy has been discussed previously, and controversial results were reported [4–8]. Many studies conducted in animals have described how osseointegration is achieved. Extrapolation of this evidence to humans requires further study and discussion.

In the present case report, we described the 10-year follow-up of a female patient (45 years old at the initial visit) who received a living-donor lung transplant during the follow-up period after dental implant placement. We focus on the status of the implant (i.e. radiographic findings and periodontal indices) in this patient, who was receiving polymedication including immunosuppressants and steroids for transplant therapy.

2. Outline of the case

A 45-year-old Japanese woman was referred to our clinic in October 1999 for comprehensive evaluation. She complained of discomfort in the upper right first molar (#3). The surrounding gingivae were swollen and radiographic findings revealed evidence of bone resorption around the palatal root. At the initial visit, no significant family or personal medical history was reported. The situation showed negligible improvement after routine treatment for periodontal disease such as scaling, root planing and local/systemic administration of antibiotics. In March 2000, the tooth was extracted, followed by a healing period of 5 months before placement of a titanium implant (Straumann Standard SLA[®] Implant: 4.8 mm diameter, 10 mm length) (Institut Straumann AG[®], Waldenburg, Switzerland), combined with an osteotome vertical sinus floor elevation

Table 1 – Medications (and function) at the time of lung transplantation.

Prednisolone (steroid hormone)
Tacrolimus (immunosuppressant)
Mycophenolate mofetil (immunosuppressant)
Famotidine (histamine H ₂ -receptor antagonist for peptic ulcer)
Alprazolam (benzodiazepine anxiolytic)
Trimethoprim/sulfamethoxazole (anti-infective)
Aciclovir (antiviral)
Itraconazole (antifungal)
Insulin (hypoglycemic)

Table 2 – Current medications (and function), as at September 14, 2011.

Prednisolone (steroid hormone)
Tacrolimus (immunosuppressant)
Amphotericin B (antifungal)
Trimethoprim/sulfamethoxazole (anti-infective)
Aciclovir (antiviral)
Alendronate (bisphosphonate for osteoporosis)
Insulin (hypoglycemic)
Rabeprazole sodium (proton-pump inhibitor for peptic ulcer)
Entecavir monohydrate (antiviral for hepatitis B)
Sodium ferrous citrate (iron preparation for anemia)

procedure. In December 2000, a screw-retained composite resin-facing crown as a superstructure was delivered (Fig. 1). From the date of delivery of this superstructure to February 2007, the patient visited the clinic a further five times for maintenance treatment. We checked for the presence of any periodontal and occlusal complications, or other implant-specific problems such as screw loosening, or detachment of the access hole filling. No such complications were detected.

In 2001, the patient was diagnosed with pulmonary alveolar proteinosis at Nagasaki University Hospital in Nagasaki Prefecture, Japan. She received bronchoalveolar lavage seven times under general anesthesia, which was unsuccessful. She then received a bilateral living-donor lung transplant at Nagasaki University in April 2008, the first time such procedure for a patient with pulmonary alveolar proteinosis had been performed in Japan. Administration of the steroid and immunosuppressant medication regime was initiated immediately after the transplant surgery (Table 1). During hospitalization, oral care including tooth brushing and rinsing with povidone–iodine solution (3 times/day), and local application of the antifungal agent, amphotericin B (4 times/day), was provided for two months after surgery. Recurrent laryngeal nerve palsy and steroid diabetes were recognized as postoperative complications, the former being resolved within one month of surgery. The patient resumed oral ingestion of food one month after surgery, and was discharged from hospital in June 2008. Her latest medication is listed in Table 2. Six months after the surgery, the patient was affected by pulmonary aspergillosis, from which she also recovered.

Two months after transplantation, the patient visited our clinic for professional maintenance care, which she has been receiving every two months since. Care includes mechanical cleaning using a toothbrush, tuft brush and interdental brush; irrigation with chlorhexidine; and oral hygiene instruction (i.e. toothbrushing technique, etc.). We also performed X-ray

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