Dental implant treatment after healing of bisphosphonate-related osteonecrosis of the jaw (BRONJ) in the same region: a case report

Ji-Wan Kim¹, Jin Baik², Ju-Hong Jeon¹

Departments of ¹Oral and Maxillofacial Surgery and ²Prosthodontics, Asan Medical Center, Seoul, Korea

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Although pathophysiology, incidence, and factors associated with the development of bisphosphonate-related osteonecrosis of the jaw (BRONJ) and management strategies for patients treated with bisphosphonates or patients with BRONJ are well-established, few guidelines or recommendations are available for patients with a history of successfully healed BRONJ. We present a case of successful dental implant treatment after healing of BRONJ in the same region of the jaw, and speculate that implant placement is possible after healing of BRONJ surgery in select cases.

Key words: Reimplantation, Dental implants, Bisphosphonate-associated osteonecrosis of the jaw, Osteonecrosis, Bisphosphonates

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I. Introduction

Bisphosphonates have been used to treat bony sequelae of malignant diseases such as multiple myeloma, metastatic diseases such as breast cancer, and osteoporosis1.

Patients receiving oral bisphosphonate therapy are at considerably low risk of bisphosphonate-related osteonecrosis of the jaw (BRONJ). BRONJ adversely affects the quality of life, producing significant morbidity in afflicted patients2. The American Association of Oral and Maxillofacial Surgeons (AAOMS) developed a task force to provide the best recommendations to clinicians for the management of BRONJ2,3. Furthermore, many articles and textbooks dealing with the pathophysiology, incidence, and factors associated with the development of BRONJ and management strategies for patients treated with bisphosphonates or patients with BRONJ have been published4-7. Unfortunately, few guidelines or recommendations have been released for patients with history of successfully healed BRONJ8.

Generally, the placement of implants in patients with a history of successfully healed BRONJ is not recommended because patients who have already experienced BRONJ are at high risk of implant failure even though this conclusion is based on empirical data and not scientific evidence8.

We present a case of successful dental implant treatment after successful healing of BRONJ in the same region.

II. Case Report

In March 2013, a 73-year-old female patient was referred to our clinic complaining of painful gingival and facial swelling at the left upper canine and first premolar area that began six months prior. Three dental implants had been placed in the left upper canine, first premolar, and first molar area at a private clinic three years earlier.

Upon physical and radiographic examination, the patient exhibited tenderness, gingival swelling, and redness on the buccal side of the two implants of the left upper canine and first premolar. Exposure of necrotic bone and alveolar bone resorption were observed at those sites. (Fig. 1)

The patient had been treated with surgical debridement therapy and antibiotic administration at a private clinic two months earlier in an attempt to relieve the symptoms. After the symptoms worsened, the patient was referred to our clinic. It was determined that the patient had been taking an...
the patient took medication for hypertension and coronary artery disease.

We prescribed antibiotics (amoxicillin with clavulanic acid and azithromycin), and the patient was instructed to maintain oral hygiene using chlorhexidine as a mouth rinse for two months, but the condition did not improve.

In May 2013, we diagnosed the patient with BRONJ and decided to remove the necrotic bone and implants. A sequestrectomy was performed at the left upper canine and first premolar area and the two implants were removed. (Fig. 2) After surgery, mucosal healing without any necrotic bone was achieved and a conventional fixed dental prosthesis was fabricated. (Fig. 3)
In March 2015, after an osseointegration phase of five months, the implants were exposed and healing abutments were placed. The implants exhibited excellent stability and the implant supported fixed prosthesis was fabricated. Eighteen months after implant surgery and thirteen months after restoration of the implants, the peri-implant region remained stable. (Fig. 7)

III. Discussion

Generally, non-invasive procedures such as mucosa-supported removable dentures are recommended for dental prosthetic rehabilitation in patients with a history of BRONJ. Unfortunately, removable dentures are often not tolerated in many patients, as seen in our presented case, and can also cause pressure spots or ulcers that might result in necrosis of the jaw. As a result, clinicians are tempted to consider implant supported prosthetic treatment as an alternative. The insertion of implants in patients who have successfully healed from BRONJ has been known to be highly risky and is not recommended.

In this case, we decided to place dental implants in the same region of the jaw with a history of BRONJ for several reasons. First, healing after surgical debridement of BRONJ was uneventful, and excellent gingival and mucosal coverage was obtained. During surgical debridement, most of the alveolar bone, which has a higher turnover rate and may be more susceptible to the osteoclastic inhibition of bisphosphonate than the basal bone of the jaw, was removed. We speculated that the basal bone of the jaw, which has a slower turnover rate, might be at less risk of recurrence than alveolar bone where BRONJ usually take place.
The patient had a history of taking oral bisphosphonates, the potency of which is usually lower than intravenously administrated bisphosphonates. Following the appropriate surgical protocol, several promising results after implant therapy were reported in patients with a previous history of oral bisphosphonate therapy. Furthermore, the patient discontinued oral bisphosphonate therapy eighteen months before the re-implantation procedure.

Sound surgical principles of infection prevention and minimizing surgical invasiveness at the time of implant placement should be observed. The patient was prescribed a prophylactic antibiotic and was encouraged to maintain her oral hygiene. During implant surgery, the usage of new drill equipment, copious saline irrigation, and avoidance of excessive insertion torque of the implant were performed. The submerged technique of implant placement was chosen.

Patients who have already experienced BRONJ are considered to be at high risk of failure for the placement of dental implants. Therefore, implant treatment has been suggested up to this point from empirical, not scientific, evidence. In our case, implant placement was successful in the same area with a history of healed BRONJ. There are very few similar reports published so far to our knowledge. This report indicates that implant placement could be possible after healing of BRONJ surgery in select cases. However, further long-term follow up and studies are necessary to confirm the viability of such a treatment.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

ORCID

Ji Wan Kim, http://orcid.org/0000-0001-7761-0649
Jin Baik, http://orcid.org/0000-0002-3622-3113
Ju-Hong Jeon, http://orcid.org/0000-0003-4730-1102

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