Pedicled Buccal Fat Pad Flap as a Reliable Surgical Strategy for the Treatment of Medication-Related Osteonecrosis of the Jaw

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Purpose: The purpose of this study was to evaluate the coverage of the pedicled buccal fat pad flap (PBFP) and the long-term results of this treatment in patients with medication-related osteonecrosis of the jaw (MRONJ).

Patients and Methods: Ten patients (2 men and 8 women; average age, 72.9 yr old) diagnosed with MRONJ were selected. Patients were treated with a PBFP. Data from patients regarding MRONJ stage, defect size, bone exposure after surgery, operation time, admission period, duration of antibiotic therapy, recurrence of disease, and postoperative complications were analyzed retrospectively.

Results: Six patients were diagnosed with MRONJ stage 2, and 4 patients were diagnosed with MRONJ stage 3. The maximum defect in the study was 62 × 18 mm. Among the 10 patients, there was only 1 bony exposure, which occurred on postoperative day 2 after receiving the PBFP. This exposure might have been due to an incomplete resection of the affected bone. There were no severe donor site morbidities, and all patients showed satisfactory healing without incident.

Conclusions: According to this evaluation, the PBFP effectively covered a relatively large surgical defect. Complications were minimal, and there was no recurrence of bony exposure during follow-up. In conclusion, using the PBFP was a reliable treatment option for the management of denuded bone in patients with MRONJ.

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Medication-related osteonecrosis of the jaw (MRONJ) is a drug-related disease and has been frequently reported in the jaw bone.[1-3] One of the predisposing factors for MRONJ is a history of surgical trauma to the jaw bone.[4] Denuded necrotic bone after implant surgery or extraction of a tooth has frequently been associated with the clinical presentation of MRONJ. Although conservative treatment has been an option for MRONJ, painful disease states require intensive intervention.[5,6]

The surgical treatment for MRONJ is removal of the necrotic bone and covering the bone defect using a flap. Trials using local mucosal flaps have exhibited high failure rates owing to poor vascularity.[7] In addition, the size of the local mucosal flap is limited. Therefore, large mucosal defects cannot be covered using local mucosal flaps. Microvascular flaps might be more reliable in poorly vascularized regions than local mucosal flaps. Large soft tissue defects also can be covered successfully with microvascular flaps.

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However, donor site morbidity and extended operation times are disadvantages of the use of microvascular flaps.[8]

Fat tissue is highly vascularized. Some technical reports have found that pedicled buccal fat pad flaps (PBFPs) can be applied to many types of intraoral mucosal defects.[9] Autogenous fat grafts have been used to improve the quality of the recipient tissue.[10] In addition, autogenous fat grafts can accelerate revascularization in burn wounds.[11] Because patients with MRONJ have poorly vascularized beds, PBFPs might represent a good treatment option for covering denuded bone areas. Fat tissue also contains stem cells.[12] The stem cells in fat tissue can differentiate into many cell types.[13] Fat-derived stem cells act as endothelial progenitor cells and promote angiogenesis.[14] Indeed, patients with small maxillary defects have been successfully treated with PBFPs.[15] However, no studies on the PBFP coverage range, associated complications, or long-term follow-up in the treatment of MRONJ have been conducted.

Patients diagnosed with MRONJ were included in the present study. The purpose of this study was to evaluate PBFP coverage and the long-term consequences of using PBFPs. All complications associated with using PBFPs also were recorded.

Patients and Methods

PATIENTS

Ten patients diagnosed with MRONJ according to guidelines of the American Association of Oral and Maxillofacial Surgeons (AAOMS) were selected.[16] The guidelines for this diagnosis include the presence of exposed bone in the maxillofacial region over a period of 8 weeks, current or previous treatment with bisphosphonates, and no history of jaw radiation. The patients were treated by a PBFP. All operations were performed by a single surgeon. This study was approved by the institutional review board of Gangneung-Wonju National University Dental Hospital (Gangneung, Korea).

SURGICAL PROCEDURES

Under local anesthesia, the Stensen duct was identified using a probe to avoid potential damage during the dissection procedure (Fig 1). The mucosal incision line is illustrated in Figure 1. This incision could not be too close to the orifice of the parotid duct and was created by considering the passage of the parotid duct. Before PBFP grafting, the recipient site was prepared (Fig 2A). After the mucosal incision, the muscle overlying the pedicled fat pad was transected enough to allow the fat pad to come out spontaneously (Fig 2B). In this procedure, the dissection was performed carefully to avoid damage to the parotid duct; thus, the authors recommend confirming the passage of the parotid duct using the probe before beginning dissection of this area. During the dissection procedure, the capsule overlying the buccal fat pad was preserved, and the small vessels overlying the capsule of the buccal fat pad were preserved by careful dissection with a blunt instrument to maintain vascular supply. This point is very important because the small vessels provide the blood supply to the PBFP. To maintain the flaps in the appropriate positions, a tagging suture within the pedicled fat pad was created (Fig 2C). In this procedure, the operator should consider reducing the dead space and maintaining a vestibular depth that is not too shallow. Because the fat pad is very fragile, 4-0 or 5-0 sutures are recommended for tagging the fat pad. Mucosal suturing was performed just above the fat layer (Fig 2D). The primary closure of the overlying mucosa helps to protect the fat pad, but, if needed, some exposure of the fat pad can be allowed to maintain vestibular depth (Fig 3).

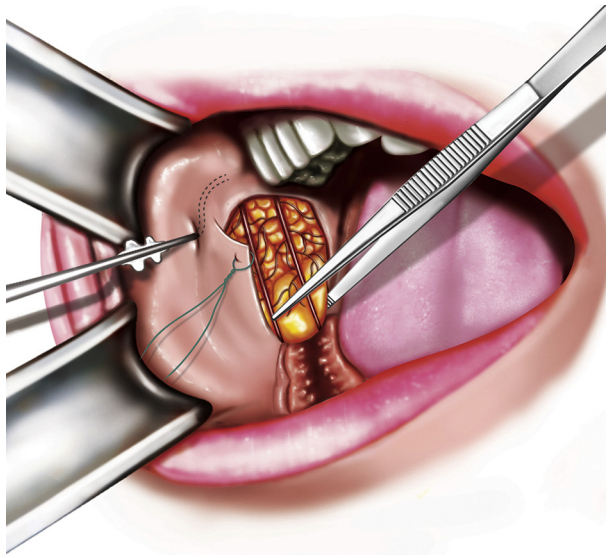

FIGURE 1. Schematic of surgical procedure. Note the identification of the parotid duct using the probe, the tagging suture in the corner of the mucosal flap, the preserved microvessels, and the capsule of the pedicled buccal fat pad.

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CLINICAL ASSESSMENT

The authors examined age, gender, type of medication, duration of medication, stage of MRONJ (AAOMS, 2009),[16] and follow-up duration. They also retrospectively evaluated the defect size, operation time, admission period, bone exposure after surgery, duration of antibiotic therapy, recurrence of disease, and postoperative complications.