II. Case Report

A female patient in her seventies presented with signs of swelling and pain in the palate around the second molar region of the right maxilla. There were signs of drainage from an oroantral fistula and there was mobility of the tooth, but the patient exhibited no percussion reaction or any other abnormal findings.

Osteomyelitis was suspected based on radiographic exam. About 14 months before her visit for the treatment of maxillary osteonecrosis, the patient had been hospitalized for uncontrolled diabetes.

After incision and drainage, she was administered amoxicillin/clavulanic acid (Amocla Tab. 375 mg; Kuhnil Pharm., Seoul, Korea), decongestants, and mucolytics to reduce maxillary sinusitis symptoms for two weeks following treatment. Her blood glucose level was appropriately regulated.

The patient returned 14 months later chief complaint of swelling in the left maxilla molar, buccal, and palatal areas, and an oroantral fistula. (Fig. 2) Panoramic radiograph and cone-beam computed tomography were taken, and the osteonecrosis now appeared broader than previously seen. (Fig. 3) A bone scan of the lesion also showed increased intake for both sides of the maxilla relative to the prior scan. (Fig. 4) She was therefore diagnosed with extensive osteomyelitis of the
maxilla and surgery was planned.

When the patient had been hospitalized for treatment of uncontrolled diabetes mellitus, her blood glucose level was estimated to be about 309 mg/dL, given that her glycosylated hemoglobin A (HbA1c) was approximately 12.4. During the 14 months when the patient was not seen, her blood glucose level was estimated to be about 200 mg/dL, given that her HbA1c was approximately 8 on follow-up in the Department of Endocrinology. After the patient was admitted to the Department of Endocrinology, her blood glucose level was controlled (HbA1c, 5.7; blood glucose level, 111 mg/dL) and surgery was performed.

Under general anesthesia, partial maxillectomy was performed to remove lesions in the canine and molar regions on the left maxilla. Sequestrectomy of the lesions in the right molar region was also performed. The defect site was covered with a buccal fat pad flap. From the removed tissue, widespread necrosis and sequestrum extending to palate area was found and a sequestrum was also observed on the right side. (Fig. 5)

The histopathologic lesions on the upper right and left maxilla were diagnosed as acute and chronic osteomyelitis.
clude dental infections, maxillary sinusitis, trauma, radiation therapy, and bisphosphonate treatment. Dental infections and sinusitis are the main causes of maxillary osteomyelitis, followed by trauma. Osteomyelitis caused by sinusitis occurs frequently in the frontal bone and rarely in the maxilla as the maxilla has relatively well-developed vascularity and a thin bone structure. However, these features can allow the lesion to spread to the surrounding soft tissue and the sinuses.

In this case, necrosis of the maxilla caused by bisphosphonate-related osteonecrosis of the jaws (BRONJ) was strongly suspected because the number of general osteomyelitis cases caused by infections has decreased and BRONJ has become more common. However, we ruled out BRONJ because the patient had no history of bisphosphonate treatment. The patient also had no history of radiation treatment.

Patients with diabetes, anemia or immunodeficiency, and patients who have been prescribed bisphosphonate are at higher risk of osteomyelitis. Diabetes has well-known effects on patients’ immune systems. According to Peravali et al., 20% of mandibular osteomyelitis cases are related to diabetes, and 68% cases of osteomyelitis of the maxilla are related to diabetes. This is because high blood glucose levels reduce with actinomycosis.

The patient underwent prosthodontic treatment and there were no signs of recurrence during 13 months of follow-up.

### III. Discussion

Predisposing factors for osteomyelitis on the maxilla include dental infections, maxillary sinusitis, trauma, radiation therapy, and bisphosphonate treatment. Dental infections and sinusitis are the main causes of maxillary osteomyelitis, followed by trauma.

Osteomyelitis caused by sinusitis occurs frequently in the frontal bone and rarely in the maxilla as the maxilla has relatively well-developed vascularity and a thin bone structure. However, these features can allow the lesion to spread to the surrounding soft tissue and the sinuses.

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...immune system efficiency by altering the blood flow distribution of the lesion, and thereby may contribute to the onset of osteomyelitis.

It is difficult to find particular odontogenic causes, and it is thought that a history of uncontrolled diabetes is an important etiological factor. Therefore, we suspect that the widespread maxilla necrosis was due to the spread of preexisting chronic maxillary sinusitis in the context of impeded blood flow and a weakened immune system due to infection. At the same time, the patient underwent amputation of the lower extremities due to diabetic foot complications, indicating poor glycemic control, and that she was susceptible to infection due to a weakened immune system.

There are many treatment methods for osteomyelitis ranging from non-invasive approaches to radical, invasive surgery. The use of antibiotics in combination with surgery is known to be effective in the treatment of osteomyelitis of the jaw. In this case, because there was widespread necrosis and...
compromised blood supply, effective penetration with antibiotics was unlikely. The thick and well-vascularized palatal mucosa remained intact even with maxillary necrosis spreading to the palate.

Therefore, in combination with antibiotics, sequestrectomy and partial maxillectomy were performed. No signs of recurrence have been observed over the course of 13 months of follow-up.

In this case, the patient’s immunocompromised state due to uncontrolled diabetes is believed to have worsened the chronic maxillary sinusitis, allowing spread into the maxillary bone. Proper control of the underlying conditions that can hinder healing is mandatory to prevent such devastating infections.
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