Mandibular osteonecrosis following herpes zoster infection in the mandibular branch of the trigeminal nerve: a case report and literature review

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Abstract

Herpes zoster virus (HZV) infections are caused by reactivation of the varicella zoster virus. Reactivation symptoms commonly affect the thoracolumbar trunk, and rarely affect the mandibular branches of the trigeminal nerve. When the mandibular branches are involved, lesions appear proximal to the innervation area. This condition may be associated with exfoliation of the teeth and osteonecrosis of the jawbone. We report a case of mandibular osteomyelitis after herpes zoster infection and we present a review of the literature on mandibular-branch involvement of HZV-related osteonecrosis.

Key words: Herpes zoster, Osteonecrosis, Trigeminal nerve

I. Introduction

Varicella zoster virus (VZV) causes chickenpox and herpes zoster (HZ). Though chickenpox usually only results in benign childhood illness, the virus remains in the sensory ganglia in a latent state. Reactivation of the latent virus causes HZ, which presents as a cutaneous vesicular eruption in the area innervated by the affected sensory nerve. HZ usually occurs in middle-aged and elderly people, at an average rate of approximately 2-3 per 1,000 people per year. The incidence increases with age: the rate is 5 per 1,000 people per year among patients >50 years old, 7-8 per 1,000 people per year among patients >60 years old, and 10 per 1,000 people per year among patients >80 years old. Predisposing factors include having human immunodeficiency virus (HIV)/AIDS, leukemia, lymphoma, or diabetes mellitus, or undergoing systemic steroid treatment, chemotherapy, or radiotherapy.

Stress or trauma can also induce HZ. The most commonly affected sites are the thoracic dermatomes (T3-L3, 56%) and the trigeminal ganglia (~20%). Of the three branches of the trigeminal nerve, the one that leads to the ophthalmic nerve is affected most frequently. Oral manifestations accompany other more common symptoms when the maxillary or mandibular branches are involved. When there is maxillary or mandibular involvement, complications, such as alveolar bone necrosis or tooth exfoliation, are reported to occur.

Herein, we report a case of osteonecrosis in the mandible after a HZ infection that involved the mandibular branch of the trigeminal nerve and we present a literature review of similar cases.

II. Case Report

A 64-year-old male patient visited at Department of Oral and Maxillofacial Surgery of Pusan National University Hospital (Busan, Korea) on December 16, 2013 and his chief complaint was alveolar bone exposure of the left mandible. Five weeks before he presented to the hospital, a skin lesion appeared along the left mandibular area and he was given an antiviral agent by a dermatologist. (Fig. 1. A) He no other relevant medical history. Intraoral examination showed alveolar bone exposure in the #34, #35 area and third degree tooth mobility in #31-#35. (Fig. 1. B) Radiographic examina-
scription for any medication that affects bone metabolism and had never received radiotherapy. We determined that the inflammation originated from the patients’ teeth; thus, we diagnosed his condition as left mandibular osteonecrosis by trigeminal HZ. We treated him with sequestrectomy and we removed teeth #31-#35. (Fig. 3) According to histopathology, eosinophilic intranuclear inclusion bodies and multinuclear giant cells were observed in the epithelium, and immunohistochemical staining showed the cells were CD68+. In the necrotic bone, neutrophils, lymphocytes and plasma cells were identified in the acute and chronic inflammation areas. (Fig. 4) No additional tooth loss, bone exposure, or osteonecrosis occurred during the follow-up period. Also, no other complications, such as postherpetic neuralgia, occurred.

This study was approved by Institutional Review Board of Pusan National University Hospital (PNUH E-2014158).

III. Discussion

Herpes zoster virus (HZV) most often affects the thoracic dermatomes and the incidence of activation in the trigeminal
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Valacyclovir at 1,000-mg doses, three times a day for a week, reduce HZ-related pain and incidence of postherpetic neuralgia as well as duration of atypical sensation. Once postherpetic neuralgia occurs, there are no effective treatments. Tricyclic antidepressants, anticonvulsant agents, gabapentin and opioids are sometimes used to reduce pain, but administration of these drugs is limited because of systemic side effects. The most effective modality is prophylactic vaccination with a zoster virus vaccine.

Generally, HZV-related osteomyelitis or osteonecrosis appears 2 to 6 weeks (average, 21.2 days) after HZ reactivation. When HZV-related osteonecrosis of the jaw occurs, it can be managed by proper antibiotic administration, curetage or debridement of necrotic tissue and periodic follow-up. In our case, we successfully managed the lesions with sequestrectomy and we performed a peripheral ostectomy until unaffected bone was exposed.

There are many predisposing factors for osteonecrosis of the jawbone. Although HZV infection involving the trigeminal nerve can cause osteonecrosis and tooth exfoliation, this condition can be managed by immediate administration of an antiviral agent, safe pain control and surgical removal of the necrotic tissue.

Conflict of Interest

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

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