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Sequestrum with actinomycosis



KEYWORDS

Sequestrum;
Actinomycosis;
Osteonecrosis;
Osteoradionecrosis

Actinomycosis is a chronic and slowly progressive granulomatous disease caused by the filamentous Gram-positive anaerobic bacteria.^{1–5} Here, we reported a case of actinomycosis associated with a sequestrum at the right maxillary tuberosity area of an 87-year-old female patient.

This 87-year-old female patient came to our dental clinic for treatment of pain and a bone-exposed area at the right maxillary tuberosity for 5 months. Periapical radiography revealed a separated bone fragment in a relatively well-defined radiolucent lesion measuring 1.8 cm in greatest diameter near the bone-exposed area in the right maxillary tuberosity. The clinical diagnosis was focal osteomyelitis with a sequestrum. After discussing with the patient and obtaining the signed informed consent, enucleation of the radiolucent bone lesion with removal a sequestrum-like bone fragment was performed under local anesthesia. The specimen was sent for histopathological examination. Microscopically, in addition to several granulation tissues with a severe lymphoplasmal cell infiltrate, a piece of sequestrum composed of lamellar bone with empty lacunae as well as necrotic tissue debris and many actinomycotic colonies in the bone marrow spaces was found (Fig. 1A and B). The actinomycotic colonies showed pale blue and red radiating filamentous bacteria at the center of the colony and deep blue filamentous bacteria arranging in a characteristic sun-ray pattern at the peripheral area of the colony. Moreover, some of the actinomycotic colonies were surrounded by both acute and chronic inflammatory cells (Fig. 1C, D, E, F, G and H). The above-mentioned characteristic findings finally confirmed the histopathological diagnosis of focal chronic osteomyelitis and a sequestrum with actinomycosis.

The actinomycotic bacteria can cause periapical infection through the infected root canal of a tooth, which is called as periapical actinomycosis.^{1,2} Recent studies showed a close association of actinomycosis with medication-related osteonecrosis of the jaws (MRONJ) and *Actinomyces* infection was considered to play a role in the development and progression of MRONJ. Brody et al.³ re-evaluated 112 previously hematoxylin and eosin-stained samples of MRONJ using the triple special stains, the so-called Gram, periodic acid-Schiff (PAS), and Grocott's methenamine silver (GMS) stains. They found that 105 (93.8%) of the 112 samples of MRONJ are infected by *Actinomyces*. In contrast, when pathologists do not specifically look for *Actinomyces*, only 8.93% of the samples are reported to be positive for *Actinomyces*. These findings suggest that the above-mentioned triple special stains are excellent methods for the detection of actinomycosis. Furthermore, Hansen et al.⁴ investigated the 45 patients with actinomycosis of the jaws with special regard to underlying disease. They found that 43 of the 45 actinomycosis patients suffer from either bisphosphonate-associated osteonecrosis or infected osteoradionecrosis. Arranz Caso et al.⁵ studied the 11 cases of bisphosphonate-related osteonecrosis of the jaws in their hospital. They showed the bone invasion by bacteria of the genus *Actinomyces* in all the 11 cases of bisphosphonate-related osteonecrosis of the jaws. The aforementioned findings indicate the intimate association of *Actinomyces* infection with the MRONJ or osteoradionecrosis.^{3–5} Although our patient did not have the MRONJ or osteoradionecrosis, the older age of the patient might render her in an immunocompromised condition that resulted in the easy infection with *Actinomyces*.

<https://doi.org/10.1016/j.jds.2022.04.025>

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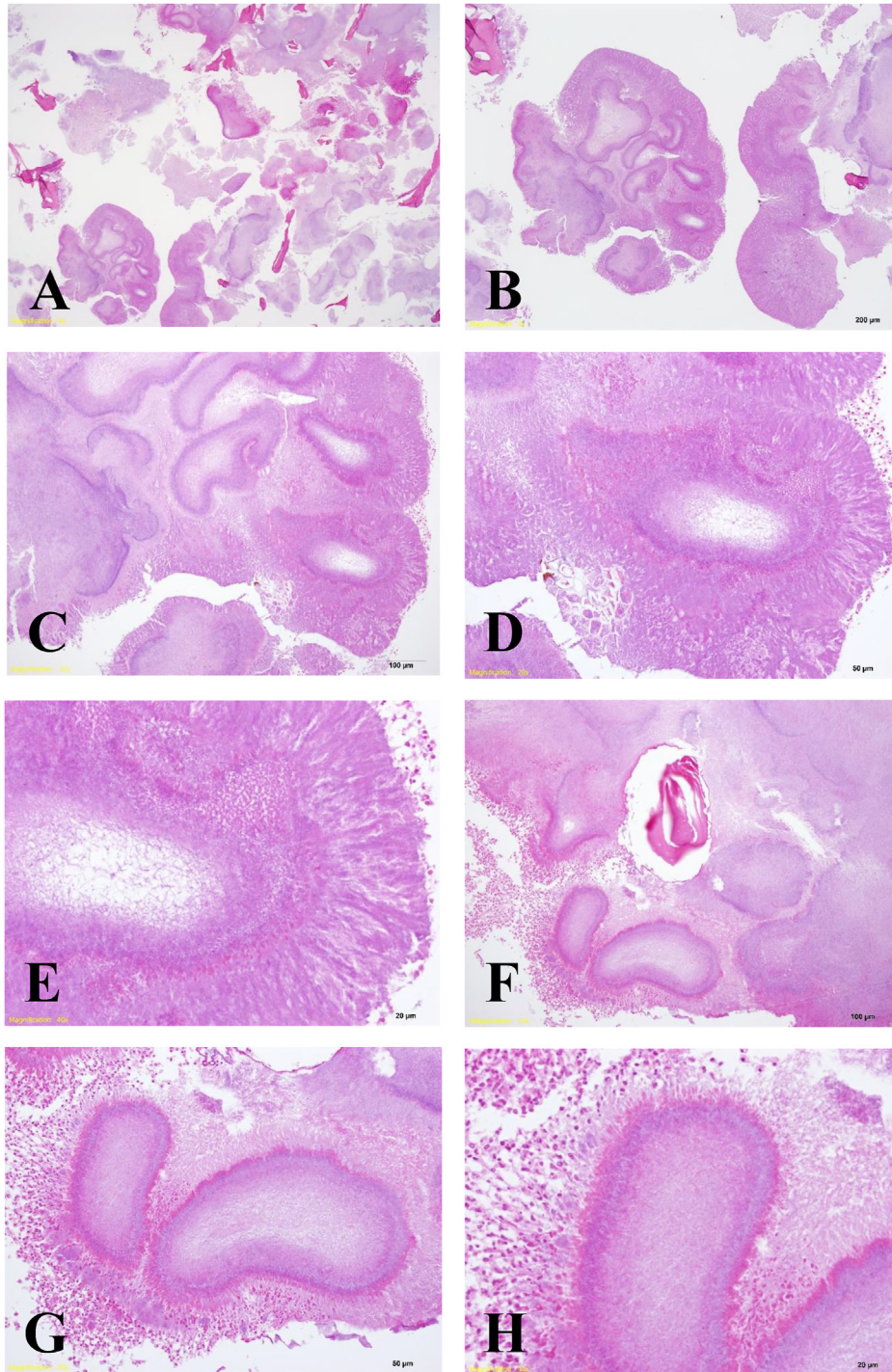


Figure 1 Histopathological microphotographs of our case of the sequestrum with actinomycosis. (A and B) Low-power microphotograph showing a piece of sequestrum composed of lamellar bone with empty lacunae as well as necrotic tissue debris and many actinomycotic colonies in the bone marrow spaces. (C, D, E, F, G and H) Medium- and high-power microphotographs exhibiting actinomycotic colonies with pale blue and red radiating filamentous bacteria at the center of the colony and deep blue filamentous bacteria arranging in a characteristic sun-ray pattern at the peripheral area of the colony. Moreover, some of the actinomycotic colonies were surrounded by both acute and chronic inflammatory cells. (Hematoxylin and eosin stain; original magnification; A, 2 × ; B, 4 × ; C, 10 × ; D, 20 × ; E, 40 × ; F, 10 × , G, 20 × ; and H, 40 ×).

Therefore, we suggest that when oral pathologists encounter a sequestrum associated with MRONJ or infected osteoradionecrosis or a sequestrum in the jawbone of an immunocompromised patient, they should concentrate on finding whether there are actinomycotic colonies in the sequestrum.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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Received 23 April 2022

Available online 11 May 2022

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