Journal of Dental Sciences 16 (2021) 1044–1046

Available online at www.sciencedirect.com

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journal homepage: www.e-jds.com

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Periapical granuloma with actinomycosis

KEYWORDS
Periapical granuloma;
Actinomycosis;
Extraradicular infection

Actinomycosis is a chronic and slowly progressive granulomatous disease caused by the filamentous Gram-positive anaerobic bacteria.[1] The actinomycotic bacteria mainly infect cervicofacial, thoracic, and abdominal regions of the human body, but they can also cause periapical infection through the infected root canal of a tooth, which is also called as periapical actinomycosis.[1] Here, we reported a case of periapical granuloma (PG) with actinomycosis at the periapical area of tooth 25 in a 32-year-old male patient.

This 32-year-old male patient came to our dental clinic for evaluation and treatment of mild pain and a sinus tract at the periapical area of tooth 25 for one month. Periapical radiography revealed a well-defined radiolucent lesion measuring 8 mm in greatest diameter at the periapical area of tooth 25. The clinical diagnosis was either a radicular cyst or a PG. After discussing with the patient, the treatment plan for this diseased tooth was endodontic treatment followed by periapical surgery. Thus root canal therapy was done first and the periapical surgery was performed under local anesthesia one week after the root canal therapy. During the surgery, fenestration of the buccal cortical plate at the periapical area of tooth 25 was found. Two small pieces of brownish soft tissues were enucleated and sent for histopathological examination. Microscopically, one relatively large piece of soft tissue specimen showed a vascularized fibrous connective tissue with foci of hemorrhage and a severe lymphoplasma cell infiltrate (Fig. 1A–C). The other small piece of soft tissue was an actinomycotic colony 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. The actinomycotic colony was surrounded by both acute and chronic inflammatory cells (Fig. 1D–F). The above-mentioned characteristic findings finally confirmed the histopathological diagnosis of a PG with actinomycosis.[1]

Criteria for the diagnosis of actinomycotic colony include filamentous bacteria aggregated to form a mass with variations in the color between the center and periphery of the colony in hematoxylin and eosin-stained tissue sections. At the high-power view, the peripheral area of an actinomycotic colony exhibits deep blue filamentous bacteria arranging in a specific sun-ray pattern. In addition, periodic acid Schiff (PAS) and Gram stains are sometimes used to confirm the diagnosis of actinomycosis, because actinomycotic colonies are positive for both PAS and Gram stains.[1] Although immunohistochemical stain is a good tool for identification of the origin of tumor cells,[2–5] it is usually not used for the diagnosis of actinomycosis. Happonen studied 16 surgically-treated cases of periapical actinomycosis and found 8 periapical granulomas, 6 radicular cysts, and 2 periapical abscesses with concomitant actinomycosis.[1] The results of the above-mentioned study indicate that periapical actinomycosis is more common than previously believed and this infection cannot be controlled by conventional nonsurgical endodontic treatments but can usually be cured by ordinary periapical surgery accompanied by a short-term (7–10 days) antibiotic coverage.[1] Therefore, if a disease tooth shows a recurrent sinus tract and poor response to conventional nonsurgical endodontic treatments combined with antibiotic control, periradicular actinomycotic infection should be highly suspected. For the PG with actinomycosis, the proper treatment includes root canal therapy followed by periapical surgery and a short course of antibiotic coverage. Healing was often uneventful after the above-mentioned proper treatments.[1]

https://doi.org/10.1016/j.jds.2021.04.015

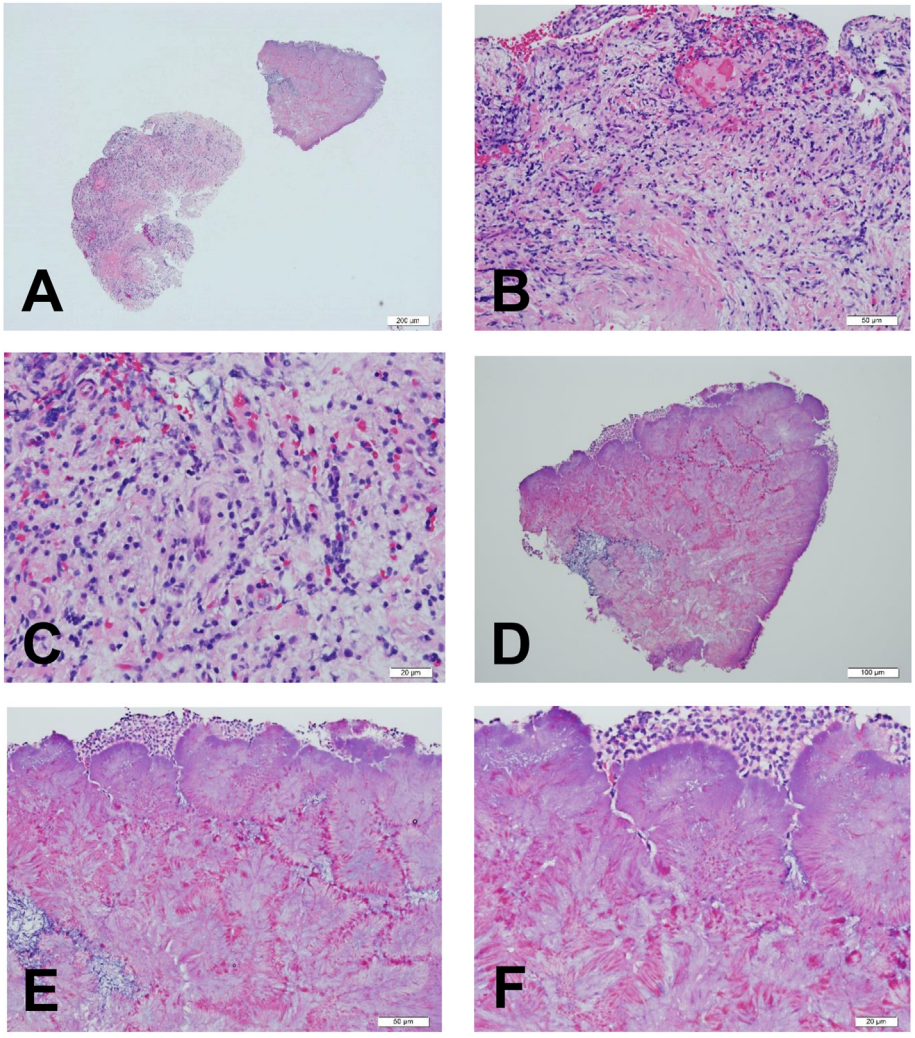

Figure 1 Histopathological microphotographs of our case of periapical granuloma with actinomycosis. (A) Low-power microphotograph showing an inflamed fibrous connective tissue and an actinomycotic colony. (B and C) Medium- and high-power microphotographs exhibiting foci of hemorrhage and a severe lymphoplasma cell infiltrate in a vascularized fibrous connective tissue. (D) Medium-power microphotograph showing an actinomycotic colony with significant variations in the color between the center and periphery of the colony. (E and F) Medium- and high-power microphotographs of an actinomycotic colony exhibiting 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 part of the colony. The actinomycotic colony was surrounded by both acute and chronic inflammatory cells. (Hematoxylin and eosin stain; original magnification; A, 2×; B, 20×; C, 40×; D, 10×; E, 20×; F, 40×).

Declaration of competing interest

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

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Received 25 April 2021
Available online 8 May 2021