Journal of Dental Sciences 19 (2024) 666–668

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jds.com

Correspondence

Radicular cyst with actinomycosis

KEYWORDS
Radicular cyst;
Actinomycosis;
Extraradicular infection

Actinomycosis is caused by Gram-positive, branching, filamentous, and anaerobic bacteria of the genus Actinomyces.[1] The actinomycotic bacteria may infect the jaw bones and cause the so-called periapical actinomycosis.[1] Here, we reported a case of radicular cyst (RC) with actinomycosis at the periapical area of tooth 25 in a 64-year-old male patient.

This 64-year-old male patient came to our dental clinic for evaluation and treatment of mild pain and a persistent sinus tract at the periapical area of tooth 25. The involved tooth had nonsurgical endodontic retreatment one month ago. Periapical radiography revealed a well-defined radiolucent lesion measuring 7 mm in greatest diameter at the periapical area of tooth 25. The clinical diagnosis was either a RC or a periapical granuloma. After discussing with the patient, the treatment plan for this diseased tooth was periapical enucleation of the radiolucent lesion, root end resection and preparation, and retrograde filling of mineral trioxide aggregates (MTA). After obtaining the informed consent, a piece of brownish soft tissue was excised under the local anesthesia and sent for histopathological examination. Microscopically, the soft tissue specimen showed a cystic lesion lined by the stratified squamous epithelium. A hyaline body of Rushton was discovered in the cystic lining epithelium (Fig. 1A). Moreover, there were cholesterol slits (Fig. 1B), foamy histiocytes, and a severe lymphoplasma cell infiltrate in the fibrous cystic wall (Fig. 1B and C). At another area of the cyst, a relatively large actinomycotic colony was noted in the cystic lumen (Fig. 1D). The actinomycotic colony was composed of pale and intermediate blue-colored bacterial aggregates at the center of the colony (Fig. 1E) and red radiating filamentous bacteria arranging in a characteristic sun-ray pattern at the peripheral area of the colony (Fig. 1F, G, and H). The actinomycotic colony was surrounded by both acute and chronic inflammatory cells (Fig. 1E, F, G and H). The above-mentioned characteristic findings finally confirmed the histopathological diagnosis of a RC with actinomycosis.[1,2]

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 or red 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 the actinomycotic bacteria mainly infect cervicofacial, thoracic, and abdominal regions of the human body, they can also cause periapical infection through the infected root canal of a tooth, which is also called as periapical actinomycosis.[1] Happonen studied 16 surgically-treated cases of periapical actinomycosis and found 8 periapical granulomas, 6 RCs, and 2 periapical abscesses with concomitant actinomycosis.[1] We also reported 6 cases of RC with actinomycosis,[2] one case of periapical granuloma with actinomycosis,[3] one case of a complex odontoma with actinomycosis,[4] and one case of a sequestrum with actinomycosis.[5] The results of the above-mentioned studies indicate that actinomycosis may involve the periapical lesions, odontoma, and sequestrum in the jaw bones.[1–5] Therefore, if a diseased 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. In addition, the proper treatments for these persistent periapical lesions include root canal

https://doi.org/10.1016/j.jds.2023.10.028

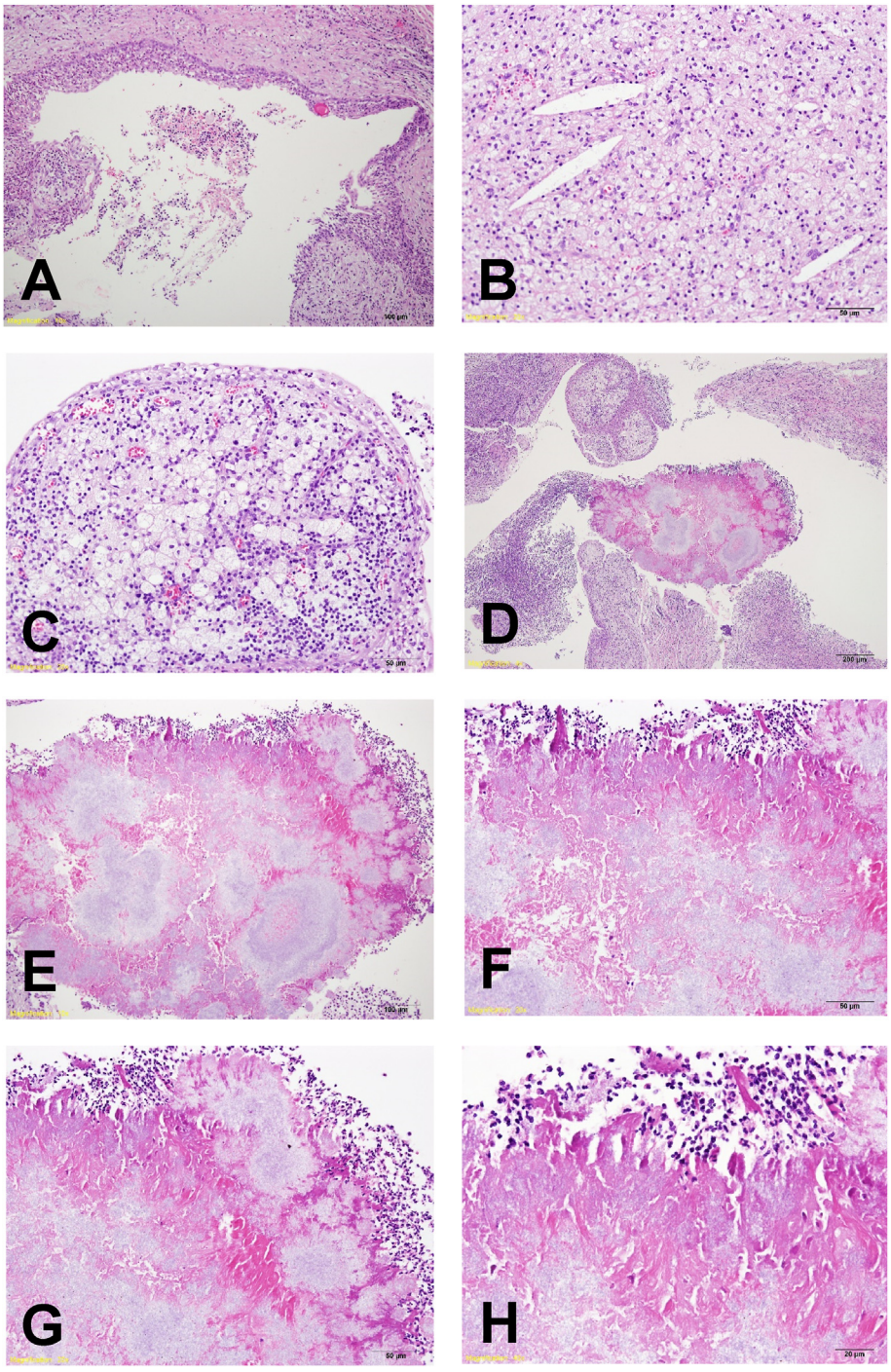

Fig. 1 Histopathological photomicrographs of our case of radicular cyst with actinomycosis. (A) Medium-power photomicrograph showing a cystic lesion lined by the stratified squamous epithelium. A hyaline body of Rushton was discovered in the cystic lining epithelium. (B and C) High-power photomicrographs exhibiting cholesterol slits (B), foamy histiocytes, and a severe lymphoplasma cell infiltrate in the fibrous cystic wall (B and C). (D) Low-power photomicrograph showing a relatively large actinomycotic colony located in the cystic lumen. (E, F, G and H) Medium- and high-power photomicrographs demonstrating an actinomycotic colony composed of pale and intermediate blue-colored bacterial aggregates at the center of the colony (E) and red radiating filamentous bacteria arranging in a characteristic sun-ray pattern at the peripheral area of the colony (F, G, and H). The actinomycotic colony was surrounded by both acute and chronic inflammatory cells (E, F, G and H). (Hematoxylin and eosin stain; original magnification; A and E, 10 × ; B, C, F, G, 20 × ; D, 4 × ; H, 40 ×). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

therapy followed by periapical surgery and a short course of antibiotic coverage. Healing was often uneventful after the above-mentioned proper treatments.[1—3]

Declaration of competing interest

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

Acknowledgments

None.

References

1. Happonen RP. Periapical actinomycosis: a follow-up study of 16 surgically treated cases. *Endod Dent Traumatol* 1986;2:205—9.
2. Hwang MJ, Lee YP, Lang MJ, Wu YH, Chiang CP, Chueh LH. Clinicopathological study of radicular cysts with actinomycosis. *J Dent Sci* 2021;16:825—30.
3. Huang HK, Hwang MJ, Chiang CP, Chueh LH. Periapical granuloma with actinomycosis. *J Dent Sci* 2021;16:1044—6.
4. Wu YH, Wu YC, Hwang MJ, Chiang CP. Complex odontoma with superimposed actinomycosis. *J Dent Sci* 2022;17:1448—9.
5. Wu YH, Huang HK, Hwang MJ, Chiang CP. Sequestrum with actinomycosis. *J Dent Sci* 2022;17:1415—7.

Po-Tang Lai[†]
I-Jen Chen[†]
Chia-Yu Li[**]
Department of Dentistry, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Hualien, Taiwan

Chun-Pin Chiang[*]
Department of Dentistry, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Hualien, Taiwan
Department of Dentistry, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan
Graduate Institute of Oral Biology, School of Dentistry, National Taiwan University, Taipei, Taiwan
Graduate Institute of Clinical Dentistry, School of Dentistry, National Taiwan University, Taipei, Taiwan

**Corresponding author. Department of Dentistry, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, No. 707, Section 3, Chung-Yang Road, Hualien, 970, Taiwan.
E-mail address: pongchew@hotmail.com (C.-Y. Li)

*Corresponding author. Department of Dentistry, Hualien Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, No. 707, Section 3, Chung-Yang Road, Hualien, 970, Taiwan.
E-mail address: cpchiang@ntu.edu.tw (C.-P. Chiang)

Received 21 October 2023
Available online 11 November 2023

[†] These two authors had equal contribution to this study.