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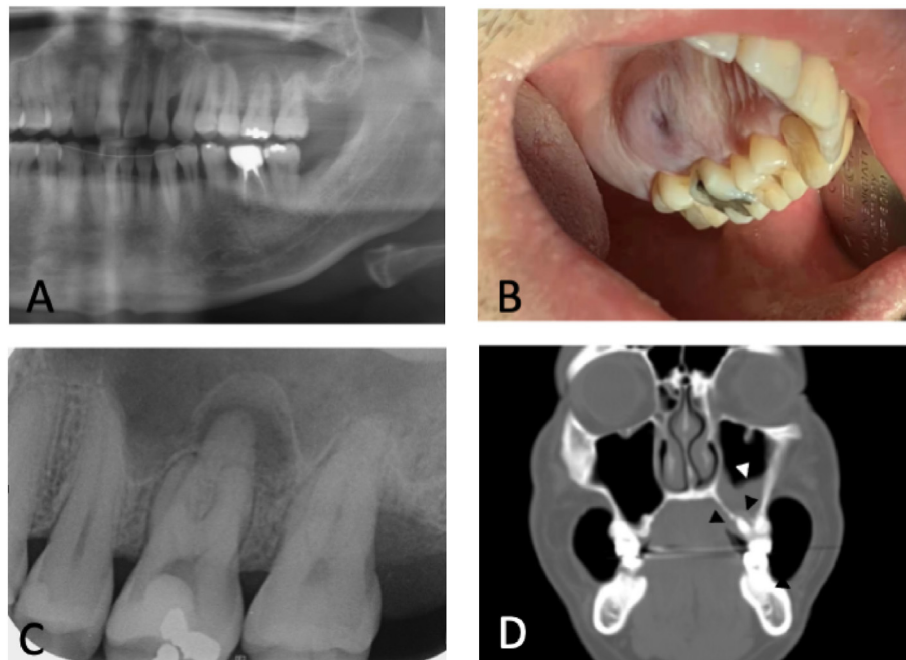
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## A spectrum of atypical pathologies emerging from a solitary endo-periodontal abscess

An endo-periodontal abscess (EPA) is an infectious disease involving two dental tissues. The atypical infectious route of EPA may cause diverse tissue responses. We presented a case of EPA with partial pulp necrosis causing odontogenic maxillary sinusitis and palatal abscess mimicking a palatal neoplasm.

A 35-year-old male patient was referred to our dental clinic for gradual deterioration of the left palatal swelling. The symptom had been occurring intermittently for 2 years. Dental history revealed orthodontic treatment and minor dental restorations. The referring dentist had opened the pulp chamber of tooth 26 for suspected endodontic



**Fig. 1** Clinical photograph and radiographs of the current case of endo-periodontal abscess with partial pulp necrosis causing odontogenic maxillary sinusitis and a palatal abscess mimicking a palatal neoplasm. (A) The panoramic film taken by the referring dentist revealed an inverted U-shaped periapical radiolucent lesion over tooth 26, with a class I amalgam filling over it. (B) The unusual palatal swelling measured  $2 \times 1$  cm close to the midline. (C) The periapical film taken after referral showed an inverted J-shaped radiolucent lesion over the palatal root apex. The pulp chamber had been opened by the referring doctor to rule out pulpal disease, with a temporary filling over the chamber. (D) The bone window CT showed palatal mucosa elevation (black arrow head), an inverted U-shaped radiolucent lesion (black arrow head), and thickening of the maxillary sinus membrane (white arrow head).

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infection and found vital pulp with no internal crack line (Fig. 1A). The atypical palatal swelling measured  $2 \times 1$  cm and extended close to the midline. The perforated lesion was soft, fluctuant, and tender to palpation. The probing periodontal pocket depth of the tooth's palatal root was down to the apex (in palatal and distal aspects) and the tooth had grade II mobility (Fig. 1B). Microscopic examination revealed two non-propagating craze lines over the crown. A periapical film showed an inverted J-shaped radiolucent lesion over the palatal root apex (Fig. 1C). Only conventional computed tomography (CT) was available. Bone window CT showed palatal mucosa elevation, an inverted U-shaped radiolucent lesion, and thickening of the maxillary sinus membrane (Fig. 1D).

The differential diagnosis of the palatal swelling included adenoid cystic carcinoma, maxillary sinusitis of endodontic origin (MSEO), and EPA.

Adenoid cystic carcinoma are the secondary most common palatal malignancies.<sup>1,2</sup> Adenoid cystic carcinoma was ruled out by soft tissue window CT due to the absence of soft tissue mass.

MSEO is the second most common cause of odontogenic maxillary sinusitis, accounting for 25.1 % of cases. Radiographic signs include periapical osteoperiostitis (a halo-like radiolucent bone lesion) and periapical mucositis (thickening of the maxillary sinus membrane).<sup>3</sup> Periapical X-rays and bone window CT scans revealed periapical osteoperiostitis and periapical mucositis. However, MSEO was ruled out as it rarely leads to oral mucosa swelling due to the absence of a vessel connection between the maxillary sinus and the oral cavity.

A dental history, examination, and an inverted U-shaped radiolucent lesion observed on a bone window CT indicated an EPA, characterized by periodontitis and grade III periodontal destruction without root damage.<sup>4</sup> For multi-rooted teeth, cone-beam CT is recommended for diagnosing endo-periodontal lesions, which may be concealed by complex anatomy. In a conventional CT setting, a bone window with multi-planar views can offer crucial diagnostic insights into endo-periodontal lesions. The radiographic findings indicated an EPA with MSEO, signifying an endodontic condition with non-vital pulp. However, tooth 26 exhibited vital pulp, suggesting partial pulp necrosis. After eliminating crack tooth-related pulp necrosis based on dental history and examination, the etiology may be linked to EPA-triggered palatal root partial pulp necrosis.<sup>4,5</sup> The affected root acted as a bacterial reservoir, transmitting toxins medially to the palatal mucosa (mimicking a tumor-like EPA), superiorly to the maxillary sinus (resulting in odontogenic maxillary sinusitis), and laterally to the alveolar bone (causing a furcation lesion) via the portal of entry and exit.<sup>3,4</sup> As a result, the diagnosis was concurrent EPA and odontogenic maxillary sinusitis. Given the tooth's hopeless prognosis, it was extracted and biopsied. The swelling had subsided within one week after the surgery. The pathological report indicated chronic inflammation.

## Declaration of competing interest

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

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