

# A comprehensive approach to management the bilateral maxillary sinus tracts: A case report

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## **A comprehensive approach to management the bilateral maxillary sinus tracts: A case report**

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### **Key Clinical message:**

This case report examines a rare instance of bilateral sinus tracts of dental origin in a 32-year-old female. The rarity of bilateral sinus tracts without vertical root fractures emphasizes the need for accurate diagnostic evaluation. This case highlights the importance of considering dental origins in atypical sinus tract presentations.

Keywords: Infection, Maxillary sinus Tracts, Endodontic treatment

### **Introduction**

A longstanding odontogenic infection can lead to pus \RL formation, which drains intra-orally or extra-orally through sinus tracts. Sinus tracts can appear in various anatomical regions and have sometimes been mistaken for epidermoid cysts, cystic acne, or salivary gland fistulas (1). There have been reports of

cutaneous fistulas (both unilateral and bilateral) caused by dental origins (2, 3). Additionally, many nasal sinus tracts have been documented (4-6).

Lesions in atypical locations can lead to misdiagnosis, unnecessary treatments, and persistent symptoms or complications (7). Given the limited literature on this topic, each case report adds valuable insight. This report describes a case of bilateral sinus tracts in a young female and reviews the relevant literature to provide a better understanding of their causes and management. To our knowledge, this is the first reported case of an alveolar bilateral sinus tract linked to a maxillary first molar.

### Case Presentation

This case report study is documented based on PRICE 2020 guidelines (8). Also, according to the Declarations of Helsinki, all ethical considerations have been observed. An endodontic specialist with 5 years of experience, performed all treatment protocols in the endodontics department of Mashhad Dental Faculty. Written and verbal informed consent was obtained from the patient. The patient also consented to report the treatment results as a present study.

### Case History/examination

A 32-year-old female presented with complaints of recurrent infections and discharge from both sides of teeth, at the Endodontics Clinic of Mashhad Dental School, Iran. The patient had been referred by a general dentist who visited her two weeks before. She had been referred by a general dentist who examined her two weeks prior. In the referral report, the dentist noted signs of infection and a history of pus drainage through the fistula in the past two months. Pre-operative radiographs and clinical photographs of the initial condition and treatment were provided by the referring dentist, as shown in Figure 1 <Figure 1>.



Figure 1 Initial and final radiographs taken by the referring dentist: A Radiograph; c) Final radiograph with temporary restoration.

### Methods(Differential diagnosis, investigations and treatment)

Radiological and clinical evaluations indicated pulp necrosis along with chronic apical periodontitis. The patient reported painful sensitivity to touch and percussion, as well as spontaneous pain. Given the discharge from both sides of the teeth, vertical root fracture (VRF) and bilateral maxillary sinus tracts were considered in the differential diagnosis, with differing prognoses for each condition. Sinus tract tracing was not possible, as the tract had closed due to the patient's prior antibiotic use, which began two weeks before her evaluation. These antibiotics had been prescribed by the referring dentist following initial Root Canal Therapy (RCT) (Figure 1C). However, probing depth assessment revealed no J-shaped lesion, making VRF less likely. Due to this and the patient's financial limitations, CT imaging was not pursued.

The patient underwent a single-visit root canal retreatment as the first-line approach for a potentially savable tooth. The procedure began with the administration of local anesthesia using 2% lidocaine and epinephrine 1:100,000 (Daroupakhsh, Tehran, Iran). The temporary restoration was carefully removed using a high-speed diamond round bur number 2 (Jota AG, Rütli, Switzerland) and a continuous water spray. The entire process was performed under rubber dam isolation and with a dental operating microscope (Zumax Medical Co., Suzhou New District, China) to ensure precision and safety. To prepare the root canals, gutta-percha

was removed with chloroform (Morvabon, Tehran, Iran), gates glidden drills (number 1, 2, 3), and M3 retreatment rotary files (UDG, Changzhou, China). The working length of the canals was determined using an electronic apex locator (Dempex, DEM Ltd., England) and verified through radiography (Figure 2A). Root canals were prepared using a crown-down technique with M3 rotary files (UDG, Changzhou, China) up to size 25 .04, except for the MB2 canal, which was shaped to a smaller size (size 20 .04). The MB2 canal was found and classified as type 2, merging with MB1 in its coronal part. Extensive irrigation and passive ultrasonic activation of sodium hypochlorite and normal saline alternately were performed during canal instrumentation. After confirming the cone fit through radiography (Figure 2B), the canals were dried using sterile paper points (META, South Korea) and obturated with gutta-percha (META, South Korea) and a bioceramic sealer (NeoSEALER Flo, Avalon Biomed, Houston, TX, USA) using a warm vertical technique with FastFill warm obturator (Fast Fill Obturation System, Eighteenth, china) (Figure 2C) <Figure 2>.

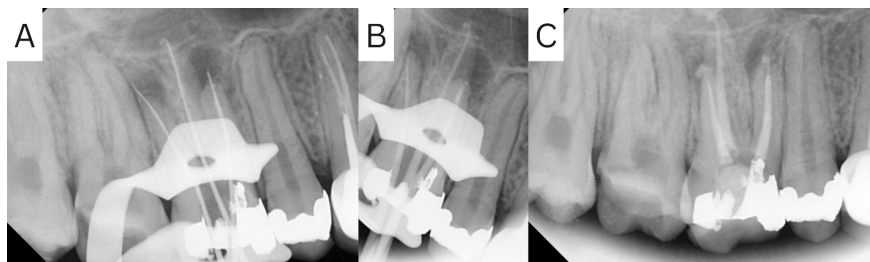


Figure 2 Retreatment radiographs; A) working length confirmation; b) master cones fit confirmation; c) obturation, final radiograph.

### Conclusion and Results (Outcome and follow-up)

The patient was followed up for six months post-intervention, with no signs of recurrence or complications. The patient reported significant relief from symptoms two days after retreatment. Follow-up radiograph at six months showed healed apical lesions (Figure 3B), and by the nine-month follow-up, there was complete resolution of the sinus tracts in the oral cavity (Figure 3C).

Photographs taken from the buccal and palatal views in the pre-operative session, 6-month and 9-month follow-up also show signs of healing of the fistulas (Figure 4). <Figures 3 & 4>



Figure 3 Post-operative follow-up radiographs: A) 4 weeks; B) 6 months; and C) 9 months. Note the simultaneous treatment of the upper second molar during the first follow-up session.

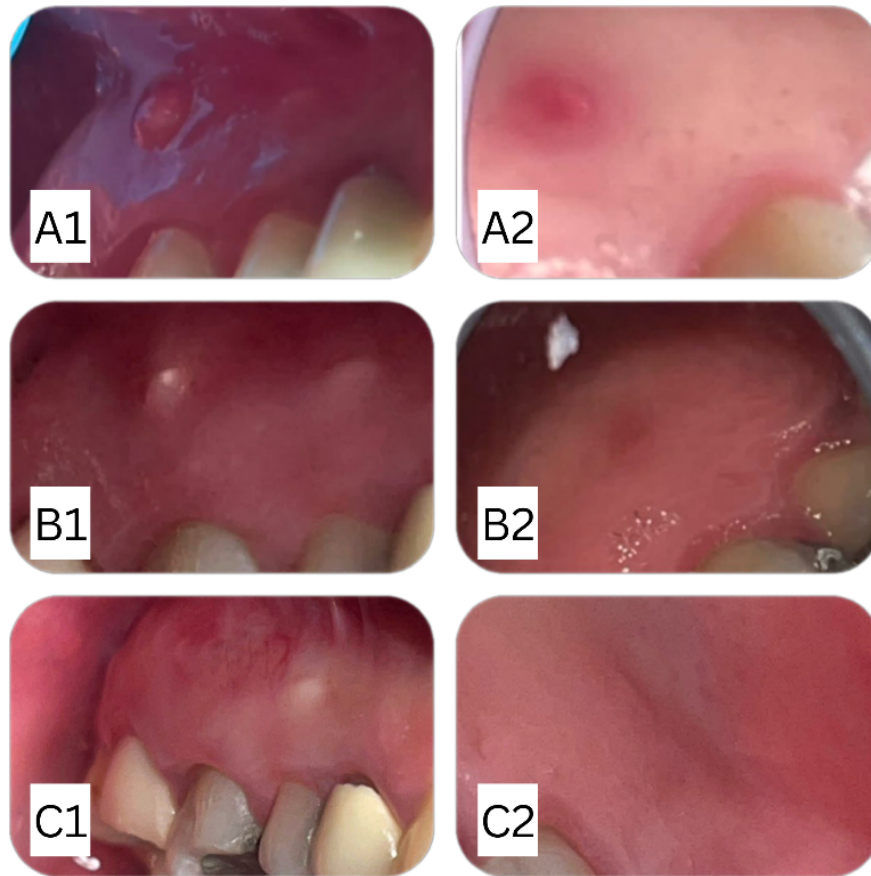


Figure 4 Photographs of clinical appearance on both buccal and palatal sides; A1) Pre-operative, buccal view; A2) Pre-operative, palatal view; B1) 6-month follow up, buccal view; B2) 6-month follow up, palatal view; C1) 9-month follow up, buccal view; C2) 9-month follow up, palatal view

## Discussion

Considering the proximity of the apices to the lingual or palatal plate in mandibular and maxillary molars, the presence of lingual or palatal fistula is to be anticipated more probably than buccal (9). A single fistula is typically observed; however, bilateral sinus tracts are commonly associated with vertical root fractures (10). There was no previous case reporting bilateral sinus tracts in a non-fractured tooth. The case presented here highlights the importance of thorough diagnostic evaluation and the potential for unusual presentations in dental practice.

A correct diagnosis is often considered three-fourths of the remedy, emphasizing the importance of accurately determining the origin of a lesion (odontogenic or non-odontogenic) for effective management. Patients with odontogenic lesions in atypical locations may undergo numerous surgical excisions, radiotherapy sessions, multiple biopsies, and various antibiotic treatments. However, since these treatments do not address the odontogenic origin of the lesion, the sinus tract frequently recurs (11).

Previous studies highlighted the need for timely intervention and the benefits of using imaging techniques for accurate diagnosis (12, 13). Cone beam computed tomography (CBCT) is particularly useful in diagnosing complex endodontic issues. It provides a three-dimensional view of periapical lesions and surrounding anatomical structures (14). However, in the present case, due to the unsuccessful root canal therapy, Clear periapical lesion, not accepting the patient to receive radiation, as well as the patient's concerns, due to

financial regards, CBCT evaluation was not done. However, clinical evaluation of probing depth helped rule out the VRF diagnosis.

Once a dental origin is correctly diagnosed, several differential diagnoses should be considered, including tumors (15), cysts (16), or a simple chronic dental infection. Treatment for odontogenic lesions can range from non-surgical approaches to more advanced surgical procedures. When a sinus tract persists, the well-epithelialized cord-like tissue often hinders healing through conventional endodontic treatment by preventing complete disinfection, allowing bacteria to persist in the periapical lesion. In cases of chronic odontogenic sinus tracts, root canal treatment alone may be insufficient, requiring the removal of the cord-like tract from the alveolar bone or its complete excision through surgery like Apicoectomy (17, 18).

This case report highlights the rare occurrence of bilateral maxillary sinus tracts in a maxillary first molar with no vertical root fracture, emphasizing the value of thorough diagnostic evaluations and advanced imaging techniques. The nine-month follow-up period, provides valuable insights into the long-term outcomes and management of such conditions. However, the single-case basis limits generalizability. Further research with larger sample sizes is needed to confirm these findings and develop standardized guidelines.

## Conclusion

This case report highlights the importance of diagnosing bilateral sinus tracts of dental origin, noting that they do not necessarily indicate vertical root fracture (VRF) in all cases. Endodontic treatment is generally effective in managing these tracts and preventing recurrence. While endodontic surgical intervention may sometimes be required, it is typically not the first-line treatment. Tooth extraction may be considered as a definitive solution, but given that healing can take longer than six months, sufficient time should be allowed before moving to extraction and implant treatment plans.

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Written and verbal informed consent was obtained from the patient to report this case accompanying images.

## Conflict of interest

No conflict of interest was declared

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## Author Contributions

Ali Chamani: Conceptualization, Project Administration, Methodology

Maryam Forghanirad: Investigation, Review & Editing, Supervision

Reza Shakiba: Original Draft Preparation, Review & Editing

Arsalan Shahri: Original Draft Preparation, Data collection

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The data supporting this study's findings are available upon reasonable request from the corresponding author. The data are not publicly available due to privacy and ethical restrictions.

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