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Journal

Dermatology Online Journal, 31(3)

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Publication Date

2025

DOI

10.5070/D331365371

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Peer reviewed

Case Presentation

Facial sinus tract mimicking cutaneous cyst or scar: unveiling a dental infection

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Keywords: dermatitis, endodontics, fistula, periodontitis

Dermatology Online Journal

Vol. 31, Issue 3, 2025

Abstract

A 39-year-old man with an unrecognized facial sinus tract under his chin initially presented with an innocuous lesion resembling an acne pimple. The patient's journey began with dermatologic intervention, involving systemic and topical antibiotics. Upon treatment failure, referral to a general dentist revealed a carious lesion on the lower right lateral incisor, prompting further investigation. A subsequent referral to an endodontic specialist led to the diagnosis of a chronic periapical abscess, and an endodontic intervention was initiated. Despite the persistence of intracanal purulent exudate, a strategic application of pure calcium hydroxide was implemented, followed by a temporary seal. A two-year follow-up demonstrated complete healing of the periapical lesion and resolution of the extraoral cutaneous sinus tract. The report shows the intricate diagnostic journey, meticulous endodontic intervention, and successful management of an extraoral cutaneous sinus tract mimicking scar or cyst, emphasizing the importance of a correct diagnosis to avoid ineffective treatment.

Introduction

To accurately diagnose an extraoral sinus tract, clinicians must consider a range of potential conditions in the differential diagnosis with dermatologic disorders including local skin infections, pseudofolliculitis, occluded sweat gland duct, osteomyelitis, neoplasms, tuberculosis, actinomycosis, basal cell carcinoma, and congenital sinusitis of the upper lip midline, acneiform nodules, or cysts.¹⁻⁶

However, one of the most common causes of the extraoral sinus tract is apical periodontitis.⁷

Teeth affected by pulp necrosis and chronic apical periodontitis may develop sinus tract. The inflammatory processes, induced by microorganisms present inside the root canal system or even in the external root surface, have the potential to penetrate the alveolar bone, navigating through the path of least resistance to reach the surrounding soft tissue and disrupt the mucosa or skin. At this stage, the drainage pathway is created and permits the emptying of inflammatory exudates, also alleviating the pressure into the tissues.^{8,9} The intraoral or extraoral opening depends on the position of the tooth, the virulence of the microorganisms involved, and the relationship between facial muscular insertions and anatomical features. These elements collectively determine the trajectory of the sinus tract.^{10,11}

This report aims to describe a case of the extraoral sinus tract erroneously treated at the beginning as a dermatologic condition but correctly diagnosed as a chronic periapical abscess in a mandibular anterior tooth. The case is particularly important to dermatologists and general dentists.

Case Synopsis

A 39-year-old healthy man, who was a smoker of one pack of cigarettes per day, went to a dermatologist because he noted a small, centrally located submental lesion (**Figure 1A**). The lesion could be described as a single well circumscribed, non-inflammatory, atrophic, submental 5x5mm area of depression. As the patient reported to the doctor, the lesion appeared like an acne pimple, with absence of purulent content, tissue loss, regional hairiness, or any apparent cause. The dermatologist prescribed systemic (oral doxycycline 100mg every 12 hours) and topical (clindamycin every 12 hours) antibiotics for 7 days. As this treatment failed, the patient was

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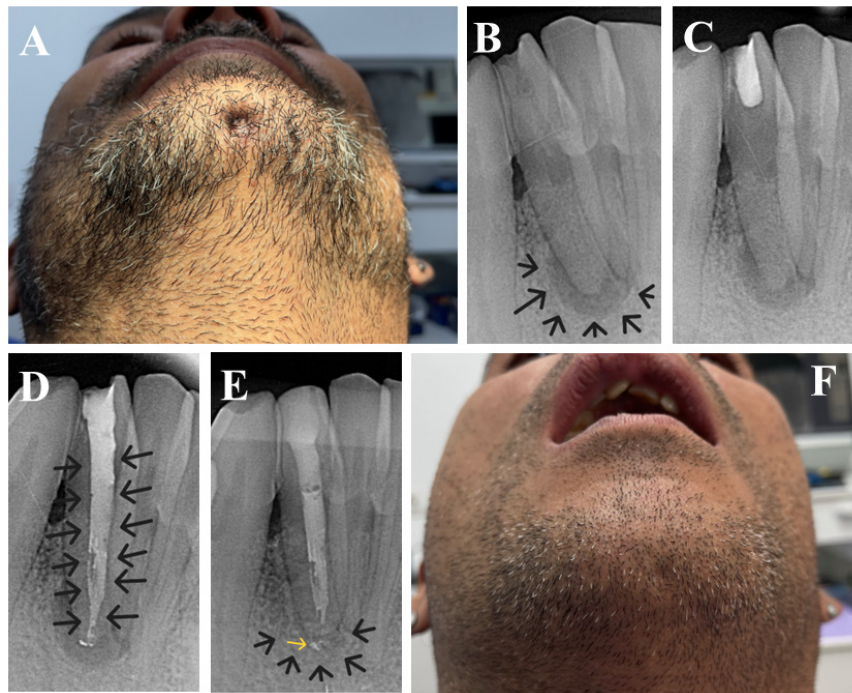


Figure 1. **A)** Initial extraoral clinical aspect, showing the lesion in the skin, located in the submental region. **B)** Initial radiograph. Note the radiolucent periapical lesion (bone resorption indicated by the black arrows) around the lower right lateral incisor, suggesting an inflammatory process owing to chronic endodontic infection. **C)** Periapical radiograph after root canal filling with calcium hydroxide. As the radiopacity of calcium hydroxide is similar to the dentin, the canal space cannot be seen. **D)** Periapical radiograph after definitive root canal filling (black arrows). **E)** Control periapical radiograph at two years. Note the health of the periradicular tissues after the lesion disappears (black arrow) and a slight non-significant sealer extrusion (yellow arrow). **F)** Final clinical aspect, showing the complete healing of the extraoral lesion—two-year control.

referred to a general dentist because of the suspicion of an oral problem.

At the dental office, careful clinical inspection of a tooth, lower right lateral incisor, led to the location of dental caries on the incisal edge and a periapical radiograph was taken using the parallelism technique. The radiographic image confirmed the caries lesion reaching the pulp cavity and the existence of a periapical lesion around the root apex of the tooth ([Figure 1B](#)). The periapical lesion was classified as large because of its dimensions of approximately 6x6mm. The patient did not report any symptoms at that time or previously.

During the session with the endodontist, diagnostic tests were performed and are summarized ([Table 1](#)). The clinical diagnosis of chronic periapical abscess was confirmed for tooth lower right lateral incisor and the endodontic treatment was initiated after the patient's consent. Both adjacent teeth appeared healthy. The endodontic intervention was performed under inferior alveolar and lingual nerve anesthesia using 1.8ml 4% articaine and 1:100,000 epinephrine. Topical anesthesia was applied to the mucosa before injection.

Conventional coronal access was performed using round and Endo-Z burs (Dentsply Maillefer, Ballaigues, Switzerland) at high speed and the treatment was conducted under rubber dam isolation and with the aid of an operative microscope (Labomed, Rotterdam, Nether-

lands). After the disinfection of the operative field with a cotton pellet embedded in 3% sodium hypochlorite, the pulp cavity was explored with #06, #08, and #10 stainless steel K-files (Dentsply Maillefer). Two canals were detected, one in the buccal and another in the lingual aspect. The patency of both canals was obtained with the #10 stainless steel K-files (Dentsply Maillefer), and they were prepared using rotary nickel-titanium files, following the Crown-Down technique with Blueshaper files (Zarc, Gijón, Asturias, España) and finishing with the file Z4 (25/6%) in both canals. The working length was established 1mm short of the root apex. During the preparation, copious irrigation with 3% sodium hypochlorite was performed, with the aid of an Irriflex needle (Produits Dentaires, Vevey, Switzerland), positioned at 2mm from the working length.

After preparation, the canals were irrigated with saline solution followed by irrigation with 2ml of EDTA 17%, activated with Z-Activator (Zarc, Gijón, Asturias, Spain). A final flush with 3% NaOCl was then performed. Owing to the persistence of intracanal purulent exudate, pure calcium hydroxide (Dentaflux, Madrid, España) was applied using the Micro Apical Placement system (MAP system, Produits Dentaires) and the tooth was sealed with Cavit (3M ESPE, Minnesota, USA) ([Figure 1C](#)).

The patient returned to continue the treatment after four weeks. Then, under the same aseptic conditions pre-

Table 1. Results of the Diagnostic Tests

Tooth	Thermal*	Percussion	Palpation	Mobility	Probing
Lower right central incisor	+	-	-	normal	3mm
Lower right lateral incisor	-	-	-	grade 1	4mm (in distal)
Lower right canine	+	-	-	normal	3mm

*Cold
negative (-), positive (+)

viously described, the provisional restoration was removed and the canals irrigated with EDTA 17%, activated with Z-Activator (Zarc) for one minute. Then, the canals were washed with physiological saline and each one was irrigated with 9ml 3% NaOCl using negative apical pressure with an EndoAspirator (Cerkamed, Stalowa Wola, Poland) and a modified Irriflex needle (Produits Dentaires). The apical 3mm was cut to leave a single frontal exit.

The canal filling was performed by the Warm Vertical Compaction technique and Neosealer Flo sealer (Avalon Biomed, Houston, Texas). Finally, temporary cement was applied to seal the access cavity, and the patient was referred for the final composite resin restoration. The radiograph obtained immediately after canal filling showed some spaces in the obturation ([Figure 1D](#)). The probable explanation for this occurrence was the intricate root canal anatomy or remains of the calcium hydroxide that could jeopardize the sealer's spreading. Over the next two years, these unfilled spaces did not compromise the healing of the apical lesion or extraoral cutaneous sinus tract.

The patient was lost to follow-up but returned two years later for treatment of another tooth, and the case was reviewed. A periapical radiograph was obtained and revealed the complete healing of the periapical lesion ([Figure 1E](#)). The skin in the region where the sinus tract was previously present was healed and the patient did not report any symptoms since the endodontic treatment was completed ([Figure 1F](#)).

Case Discussion

Primary care physicians and dermatologists are usually the first to see patients affected by extraoral cutaneous sinus tracts. However, odontogenic origin should be suspected whenever cutaneous lesions are present in the orofacial region. Therefore, a meticulous history and consultation with a dentist are important to avoid misguided treatments. In the reported case, antibiotics were erroneously prescribed because of an incorrect diagnosis. After being referred to an endodontist, a chronic apical periodontitis was successfully detected and treated.

Apical periodontitis associated with sinus tracts have been observed at a prevalence ranging from 8.5% to 18%.^{7,12} Intraorally, these tracts manifest more frequently, particularly on the buccal mucosa of teeth with significant apical periodontitis lesions.¹² However, in

cases where the location is extraoral, 80% are attributed to mandibular teeth, with purulent drainage commonly observed in the chin or submental area.¹³ In the case presented, the problem originated in a mandibular lateral incisor; dental caries was found in the incisal edge that compromised the dental pulp and periapical tissues. Teeth exhibiting chronic apical abscesses and sinus tracts exhibit a highly intricate infectious pattern within the apical root canal system, characterized by a high prevalence of biofilms. In numerous cases, these biofilms extend to the outer root surface, giving rise to an extraradicular infection (acute apical abscess with periapical pus).¹⁴

The diagnosis of this type of lesion can be a challenge for health professionals owing to the frequent absence of symptoms.¹⁵ Attention should be paid to oral clinical conditions such as caries, poor restorations, and periodontal status.^{16,17} Also, changes in tooth coloration should be carefully observed with emphasis on the history of possible trauma. The approach to handling sinus tract lesions involves eliminating the origin of the dental infection.^{2,18} If the sinus tract disappears with the treatment, it is a sign that the infection was controlled or significantly diminished.^{14,19} However, there is always a risk of recurrence. Although the most common cause of cutaneous sinus tracts in the face and neck is the result of chronically draining dental infection, it can be associated with various dermatologic inflammatory and/or infectious conditions. These include hidradenitis suppurativa, actinomycosis, tuberculosis cutis orificialis, and foreign body reaction.

There is controversy about whether or not the sinus tract is lined with epithelium. Although some studies confirmed²⁰ other studies observed the absence of epithelial tissue, reporting only granulation tissues.²¹ Despite this, it has been established that root canal treatment of the related tooth may be sufficient for sinus tract resolution. In the case presented, it was decided to perform endodontic treatment alone, achieving complete resolution of the apical periodontitis and the associated extraoral cutaneous sinus tract. A retrospective study evaluated the outcome of the endodontic treatment/retreatment of teeth with intraoral sinus tracts and revealed that in 94% of cases, the sinus tract healed in less than one month.¹⁹

Although this case report provides valuable insights into the accurate diagnosis and treatment of an extraoral sinus tract, certain limitations should be acknowledged. Individual variations in treatment responses and patient-

specific factors may impact the general applicability of the described therapeutic approach.

Conclusion

Odontogenic origin should always be considered in any case of extraoral cutaneous sinus tract involving the face or neck. Clinical and radiographic dental examinations can contribute to the localization of the affected teeth and avoid unnecessary antibiotic or surgical treatment.

In the reported case, resolution of the apical periodontitis and the extraoral cutaneous sinus tract was achieved after the adequate root canal treatment of the affected tooth.

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Potential conflicts of interest

The authors declare no conflicts of interest.

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