



## Case Report

# Misdiagnosis of dental sinus tract

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### ABSTRACT

Cutaneous dental sinus tract arises as a consequence of chronic periapical periodontitis induced by pulp degeneration or necrosis. The absence of symptoms along with its unusual occurrence lead to ill-suited treatments. So, more often than not, it is misdiagnosed at the beginning. This article presents in detail the management of a 17-year-old patient in a good systemic health complaining of a sinus tract under his chin, which is secondary to pulp necrosis of the mandibular central incisor. A non-surgical endodontic treatment of this fistula was performed, which led to a successful resolution of the sinus tract, and which promoted periapical healing of the tooth involved. The article aims at highlighting the case history, diagnosis and management of this odontogenic cutaneous fistula.

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## 1. Introduction

Odontogenic cutaneous sinus tracts are infrequent but have been often recorded. However, they're still misdiagnosed most of the time, inducing uncalled-for procedures and patient suffering.<sup>1</sup> In most of the cases, OCST on the facial and cervical skin come out of a chronic apical periodontitis caused by pulp necrosis.<sup>2</sup>

The apical infection spreads out throughout the medullary cavity, and subsequently penetrates into the cortical bone.<sup>3</sup> When the infection reaches the soft tissue, it invades the least resistant path between the facial spaces and finally gets to perforate the mucous or skin surface.

There is a multitude of factors behind this abscess. It could be a bacterial attack, chemical irritation or trauma. However, acute apical abscess is commonly initiated as a reaction to carious exposure and subsequent bacterial invasion of the tooth pulp.<sup>4</sup>

The drainage location can be intra-oral or extra-oral, which depends on some circumstances like the diseased tooth, the apex position of the muscular attachments, bacterial virulence and reduced host resistance. About 80%

of dental sinus tracts spring from mandibular teeth with periapical lesions (PLs). They are seldom found in the maxillary area (only 20%). So, cutaneous drainage takes place frequently in submental and submandibular spaces.<sup>5</sup>

The treatment of such skin lesions consists in removing the source of the infection and draining the pus away. This is usually achieved through conventional endodontic treatment and, at times, by periapical surgery to extract the teeth considered to be irrecoverable. Such treatment modalities proved to be effective in treating sinus tracts in no time.<sup>6</sup>

This report aims to present a case of cutaneous dental sinus tract successfully managed only through conventional endodontic treatment within a matter of a few weeks.

## 2. Case Report

A 17-year-old male with a skin lesion under his chin turned to the Department of Conservative Dentistry & Endodontics at the University Clinic of Dentistry of Monastir. His medical history was negative. He had a trauma in his lower lip and teeth when he was 10, without receiving the necessary dental treatment at the time.

The clinical examination revealed an erythematous nodule measuring approximately 1cm in diameter located

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under his chin, having been there for three months. Gentle pressure on the surrounding tissue did not elicit purulent discharge (Figure 1).

The intra-oral examination revealed poor oral hygiene but no tooth decay. All the same, the mandibular right central incisor was dyschromic and did not respond to the pulp sensibility testing (Figure 2).

Tooth 41 was slightly percussion-sensitive; the radiographic examination revealed a periapical radiolucency associated with the tooth root. The case was diagnosed with an emerging cutaneous sinus tract secondary to a chronic periapical abscess of the mandibular right central incisor (Figure 3).

During the first visit, tooth 41 was isolated with rubber dam, and a standard access cavity was prepared. The root canals were cleaned and shaped using rotary nickel-titanium instruments (2Shape, Micro Mega). They were irrigated using 3% sodium hypochlorite in abundance. The working lengths were determined using electronic apex locator (Rootor, META BIOMED) and the established working lengths were controlled radiographically. Calcium hydroxide paste (MM-Paste™, Micro-Mega, Besançon, France) was placed as an intra-canal medication for two weeks, and the access cavity was sealed with temporary filling (MD-Temp™, META Biomed co).

On the second visit, the sinus tract had already disappeared (Figure 4) and the tooth was asymptomatic. After applying a rubber dam and removing the intra-canal dressing, the root canal was irrigated again and the moisture was eliminated using paper points. The root canal obturation was carried out with composite sealer and gutta-percha points using the warm condensation technique. The coronal seal was performed with composite resin (Filtek Z350 XT 3 M ESPE). Immediately afterwards, a control radiograph was taken to assess the obturation (Figure 5).

A couple of months after the treatment, full healing of the extraoral fistula with minimal scarring was observed, and, a year later, the radiographic examination showed a regression of the radiolucent lesion (Figure 6).

### 3. Discussion

OCSTs in the face and neck regions are uncommon and pose a diagnostic dilemma to clinicians since they present a wide range of diseases.

Instead of visiting a dentist, people usually consult a general practitioner or a dermatologist at first. This is ascribed to the absence of any dental symptoms and the incomprehension of the possible connection. As a result, they're often liable to uncalled-for procedures and treatments such as surgical excision or antibiotic regimens. So, the dental causes of sinus tracts go ignored because the wrong diagnosis cannot elucidate the aetiology of the disease, and thus, altering the treatment choice when it recurs is improbable.<sup>7</sup>



Fig. 1: Cutaneous sinus tract under the chin



Fig. 2: Intra oral view of dyschromia of 41

At first, our patient consulted an oral and maxillofacial surgeon. He underwent incision and drainage and was prescribed an antibiotic therapy for 10 days (amoxicillin and clavulanic acid). However, the fistula persisted, and in the absence of healing, surgical excision proved inappropriate. Accordingly, the surgeon referred the patient to our department to be tested for any possible dental infection.

So, when faced with cutaneous sinus tracts of unspecified etiology involving the submandibular or submental region, dermatologists or plastic surgeons should refer the patient to dentists in order to exclude a possible dental origin, even in the absence of associated symptomatology.<sup>8</sup>

The most common cause of cutaneous sinus tracts is pulp necrosis secondary to tooth decay or trauma.<sup>9</sup> Yet,



**Fig. 3:** Radiographsshowing a periapical lesion 41



**Fig. 5:** Postoperative radiography



**Fig. 4:** Healing of the lesion (Two weeks)



**Fig. 6:** Control Radiograph after 1 year

in chronic infections, the local inflammation may creep through the alveolar bone along the path of least resistance.

Dental sinus tracts may drain through the face skin depending on the relationship of the muscle attachments and the facial tissue planes to the infection site. If the infection area is higher than the muscle attachment site at the level of the maxilla, or lower than the muscle attachment site at the level of the mandible, a sinus tract may appear on the face.<sup>10</sup>

A cutaneous dental sinus tract may have clinical features akin to other facial lesions such as pyogenic granuloma, actinomycosis furuncle, branchial cleft cyst, squamous cell carcinoma or epidermal cyst.<sup>11</sup> This resemblance may lead to the above-explained misdiagnosis dilemma, and that is why a differential diagnosis is required.

The right diagnosis calls for checking the patient's medical history and a careful oral examination together with the use of some useful diagnostic processes and aids such as palpating the lesion, testing pulp vitality and sensibility, tapping and carrying out an intra-oral radiograph with a gutta percha point put right through the sinus tract.<sup>4,12</sup>

A periapical radiograph usually detects tooth decay or residual roots as well as the associated periapical lesion that could be apical granuloma or radicular cyst. Periapical X-rays show the presence of radiolucency at the apex of the infected tooth.<sup>13</sup>

Cutaneous sinus tracts of odontogenic origin emerge as papules or nodules with purulent drainage. The palpation of the affected area may identify a cord-like tract connected to the underlying alveolar bone surrounding the suspected tooth and drains pus, which establishes the properness of the diagnosis.

The treatment choices for OCSTs are either endodontic therapy for restorable teeth or extraction for non-restorable teeth.<sup>7</sup> In general, orthograde root canal treatment is sufficient to eradicate the infection because the sinus tract gradually disappears in about 5 to 14 days.<sup>14</sup>

On performing endodontic treatment, root canal irrigation is a crucial step determining the efficiency of canal treatment. Thanks to its antibacterial and necrotic tissue dissolution properties, sodium hypochlorite is still the best solution and is frequently used.<sup>15</sup>

Calcium hydroxide (Ca(OH)<sub>2</sub>) is currently used as an intra-canal medication in endodontics. It has been needed for a quick and efficient treatment of the sinus tract associated with non-vital teeth. It can encourage the bone to heal and successfully cleanse the root canal system. It biologically functions through dissociating in Ca<sup>2+</sup> and OH<sup>-</sup> ions owing to its strong alkalinity (pH 12.5) and its capacity to damage cell membranes and protein structures.<sup>16</sup> So, the application of calcium hydroxide seems to make an appropriate environment in favor of bone repair and sinus tract healing.

Once the dental origin of the cutaneous sinus tract is removed, the sinus tract and skin lesion usually heal within

5 to 14 days.<sup>17</sup> In our case, healing resulted in cutaneous retraction after 15 days. In fact, the tract usually heals with slight dimpling and hyperpigmentation of the skin. That diminishes over time but revision cosmetic surgery is recommended in case of notable retraction or dimpling. In our case the result is cosmetically tolerated.<sup>18</sup>

#### 4. Conclusion

By way of conclusion, proper diagnosis is the key to an efficient treatment of cutaneous sinus tracts of dental origin. Non-surgical treatment is the first choice of treatment that will result in predictable and rapid healing of these lesions, and surgery should only be considered in cases resisting conservative therapy.

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#### 6. Conflict of Interest

None.

#### References

1. Cohenca N, Karni S, Rotstein I. Extraoral Sinus Tract Misdiagnosed as an Endodontic Lesion. *J Endod.* 2003;29(12):841–3.
2. Cantatore JL, Klein PA, Lieblch LM. Cutaneous dental sinus tract, a common misdiagnosis: a case report and review of the literature. *Cutis.* 2002;70(5):264–7.
3. Heling I, Rotstein I. A persistent oronasal sinus tract of endodontic origin. *J Endod.* 1989;15(3):132–4.
4. BFowler E, Berault LG, Galvan D. Nasal Fistula Associated with Dental Infection: A Report of a Case. *J Endod.* 2000;26(6):374–6.
5. Ronald SB, Robert J, Tawana F, Frances ES. Cutaneous sinus tracts (or emerging sinus tracts) of odontogenic origin: A report of 3 cases. *Clin Cosmet Investig Dent.* 2010;2:63–7.
6. Swift JQ, Gulden WS. Antibiotic therapy—managing odontogenic infections. *Dent Clin North Am.* 2002;46(4):623–33.
7. Chowdri NA, Sheikh S, Gagloo MA, Parray FQ, Sheikh MA, Khan FA, et al. Clinicopathological Profile and Surgical Results of Nonhealing Sinuses and Fistulous Tracts of the Head and Neck Region. *J Oral Maxillofac Surg.* 2009;67(11):2332–6.
8. Sheehan DJ, Potter BJ, Davis LS. Cutaneous Draining Sinus Tract of Odontogenic Origin: Unusual Presentation of a Challenging Diagnosis. *Southern Med J.* 2005;98(2):250–2.
9. Slutzky-Goldberg I, Tsesis I, Slutzky H, Heling I. Odontogenic sinus tracts: a cohort study. *Quintessence Int.* 2009;40(1):13–8.
10. Johnson B, Remeikis NA, Cura JV. Diagnosis and treatment of cutaneous facial sinus tracts of dental origin. *J Am Dent Assoc.* 1999;130(6):832–6.
11. Yuksel S, Stoll R, Roggendorf MJ, Frankenberger R. Cutaneous sinus tract of endodontic origin: a case report. *ENDO (LondEngl).* 2010;4(3):223–9.
12. MITTAL N, GUPTA P. Management of Extra Oral Sinus Cases: A Clinical Dilemma. *J Endod.* 2004;30(7):541–7.
13. Ronald SB, Robert J, Tawana F, Frances ES. Cutaneous sinus tracts (or emerging sinus tracts) of odontogenic origin : a report of 3 cases. *Clin Cosmet Investig Dent.* 2010;2:63–7.
14. Castellucci A. Non-surgical therapy of mucosal and cutaneous fistulae. *Roots.* 2009;1:32–42.
15. Kansal R, Kaushik A, Talwar S, Chaudhary S, Nawal R. NON SURGICAL MANAGEMENT OF CUTANEOUS SINUS TRACT

- OF DENTAL ORIGIN: A REPORT OF THREE CASES. *J Evol Med Dent Sci*. 2013;2(46):9042-7.
16. Foster KH, Primack PD, Kulid JC. Odontogenic cutaneous sinus tract. *J Endod*. 1992;18(6):304-6.
  17. Yang ZP, Lai YL. Healing of a sinus tract of periodontal origin. *J Endod*. 1992;18(4):178-80.
  18. Bender IB, Seltzer S. The oral fistula: Its diagnosis and treatment. *Oral Surg*. 1961;14:1367-76.

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