

# Surgical management of an odontogenic cutaneous sinus tract misdiagnosed for 4 years

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## Abstract

A cutaneous sinus tract of dental origin may easily be misdiagnosed and incorrectly treated. This paper reported a case of a 20-years-old male patient referred for a productive cutaneous sinus tract misdiagnosed by medical doctors for more than 4 years. The clinical and radiographic examinations confirmed the odontogenic origin

## Introduction:

Cutaneous sinus tracts of dental origin are relatively uncommon and are often initially misdiagnosed and inappropriately treated, due to their rarity and the absence of specific symptoms (1).

This condition is defined as a pathologic canal leading from an enclosed area of inflammation or infection that opens to an epithelial surface of the face or the neck. (2)

Odontogenic cutaneous sinus tracts occur as a sequela of bacterial invasion of the dental pulp. Necrotic affected teeth exhibit apical periodontitis due to spread of infection into the periarticular area. The infection follows the path of least resistance between facial spaces, desiccate and breakthrough the skin to form draining sinus tracts. (3)

A review of several reported cases showed that patients may undergo multiple unnecessary attempts of surgical excisions, drainage, biopsies, and long-term use of antibiotics with no remission, due to improper diagnosis and the lack of treatment of the infectious dental origin. (4,5). Besides, in most cases, cutaneous sinus tracts of dental origin may not have any apparent dental symptoms and may progress over a long period of time without alarming the patient.

The aim of this paper was to present a case of a misdiagnosed cutaneous sinus tract related to an infected radicular cyst and which was inappropriately treated for 4 years without any remission, and to highlight the importance of considering chronic dental infections as part of differential diagnosis for any orofacial skin lesion.

### *Patient and observation:*

A healthy 20-years- old male patient was referred by a general practitioner to the department of dentistry at the university hospital Sahloul for cutaneous productive sinus tract mimicking acne.

The patient reported a 4-years-history of a drained and recurrent abscess in his right cheek that has previously been treated with different therapeutic procedure such as topical antibiotics and steroids (Bactrim, dermocort) prescribed by his dermatologist, however, no response was noted.

Besides, the patient did not report any history of dental pain or infection.

The extra-oral examination showed the persistence of a cutaneous fistula with a crusted appearance located on the lower part of right cheek measuring about 5 mm in diameter (Figure1.a). Gentle pressure on the surrounding tissue elicited a purulent discharge on the surface (Figure1.b).

Palpation showed the presence of a cord-like tissue that linked to fistula to the mandibular vestibular bone.

The endobuccal examination revealed a poor oral hygiene as well as a decayed mandibular first molar (tooth 46) (Figure 2).

Pulp testing, percussion, and periodontal probing were carried out for the tooth, and revealed normal responses. No sign of mobility was present. Neighboring and contralateral teeth were also tested and were all within normal.

Panoramic radiograph revealed a large radiolucency of 2 cm diameter with a well-defined cortical border in relation with the roots of the tooth 46 (Figure 3)

Computed tomography (CT) scan was indicated and the axial slices confirmed the periapical cystic lesion associated to the roots of 46. It also revealed a local perforation on the buccal alveolar table in front of the corresponding

tooth (Figure 4).

The diagnosis of infected radicular cyst associated to a cutaneous sinus tract was made.

Extraction of the tooth 46 and cyst enucleation under local anesthesia was indicated. Thus, a mucoperiosteal flap was elected and revealed a cord-like tract attached to the vestibular bone in the periapical region. The tooth 46 was extracted followed by the excision of the radicular cyst (Figure 5.a). A meticulous curettage of the alveolar site (Figure 5.b) followed by the dissection and the excision of the cord like tract. The part of the tract attached to the bone was released (Figure 5.c). Immediately after the excision of the whole sinus tract (Figure 5.d), the skin was undermined to relax the affected area and restore normal facial contour. Sutures were placed (Figures 5.e), and the patient was prescribed antibiotic therapy (amoxicillin – clavulanic acid) as well as antiseptic mouth wash and pain killers for 1 week.

Histopathological examination of the lesion confirmed the diagnosis of odontogenic radicular cyst.

Follow up was marked by the progressive healing to the cutaneous tract. At 1 month follow up the lesion almost totally disappeared. (figure 6.a; Figure 6.b)

## DISCUSSION

Cutaneous fistula of dental origin are uncommon lesions, but have been well documented in the literature. However, misdiagnosis and inappropriate treatment often arise (1).

Due to their location on the head and neck region, odontogenic cutaneous fistulas are the interest of several medical specialties (6). These tracts often have a clinical appearance similar to other skin lesions (7). The dermatologists and general practitioners are often consulted first (6). In this context, our patient consulted three general practitioners and two dermatologists, during four years, and was always prescribed different topical treatments including antibiotics and steroids but no remission was observed.

Besides, in most cases, cutaneous sinus tracts of dental origin may not have any apparent dental symptoms and may progress over a long period of time without alarming the patient (7).

The odontogenic cutaneous sinus tract on the oro-cervicofacial region often develops as a result of chronic apical lesion caused by pulp degeneration or necrosis. The apical infection may spread through the narrow space, then perforate the cortical alveolar bone. In soft tissue, the infection may spread through the path of least resistance between facial spaces and finally perforate a mucosal or cutaneous surface (7).

In this fact, when diagnosing and treating sinus tracts of unknown etiology in the facial and cervical area, dermatologist or plastic surgeon should always refer patients to the dentists to eliminate a possible dental

infection (7).

Such diagnostic and therapeutic misadventures highlight the importance of collaboration between medical and dental practitioners in the management of patients with head-and-neck lesions (8).

Early diagnosis and appropriate treatment are essential. A proper diagnosis should include medical history of the patient, inspection and palpation of the cutaneous lesion.

Clinically, a cutaneous dental fistula has nonspecific skin manifestations and may resemble a pimple, ulcer, nodule, draining lesion or indurated cystic area with purulent discharge (9) which in the most cases are found on the chin and the cheek area but rarely in the nasal region (10).

Samir et al described a classic cutaneous fistula with dental origin as an erythematous nodule of diameter up to 20 mm with or without drainage presenting skin retraction after healing. (11)

In this case, patient consulted for a suppurative cutaneous sinus tract with depression aspect in the right cheek with local alopecia of the whole area.

Besides, intra oral examination may reveal one or several decayed teeth, a healthy-looking tooth with an intact crown but an endodontic infection, or injured tooth (7). With this regards, Chan et al reported an odontogenic cutaneous sinus tract caused by vertical root fracture (12). Caliskan et al. also reported a case of cutaneous sinus tract caused by a fractured crown (13).

Pulp vitality test, percussion, and periodontal probing should be performed on the suspect tooth and adjacent teeth (7).

Radiographic examinations, conventional or advanced imaging, should be indicated to identify a radiolucency at the peri apical region of the suspected teeth (8).

The indication of advanced 3D imaging is necessary, and patients should be evaluated using panoramic radiograph and cone-beam computed tomography (CBCT) to evaluate the extend of the lesion and eventually confirm the causal tooth (14,15).

In the present case, the tooth 46 was severely decayed with an infra gingival and juxta-osseous dental tissue destruction, but surprisingly the patient didn't report any episodes of pain or discomfort.

CBCT showed the existence of local perforation of the vestibular alveolar bone as well as a local bone sclerosis, which was not revealed by the conventional 2D radiography and which confirmed the chronic progressive evolution of the lesion.

In some cases, the insertion of a probe or an endodontics gutta-percha along the sinus tract is helpful for the ascertainment of the causal tooth. (10)

But this is not usually possible with cutaneous sinus tracts- like in this reported case- due to the distance between the fistula orifice and the alveolar bone as well as the presence of multiple plans: mucosal, muscular, and Cutaneous. (16)

The differential diagnosis includes traumatic lesions, fungal and bacterial infections, pyogenic and foreign body granulomas, basal cell carcinomas, local skin infections such as carbuncle and infected epidermoid cysts, chronic tuberculosis lesion, osteomyelitis, actinomycosis, and gumma of

tertiary syphilis. Rare entities to be included in the differential diagnosis are developmental defects of thyroglossal duct origin or branchial cleft, salivary gland and duct fistula, dacryocystitis, and suppurative lymphadenitis. (10,17,18)

The treatment of odontogenic cutaneous sinus tracts requires the elimination of the infection origin. Systemic antibiotic therapy was reported to result in a temporary reduction of the drainage and an apparent healing.

However, the extraction, when indicated, or the conventional root canal treatment -when possible- are the treatment of choice. (19)

Antibiotics may be recommended as an adjunct to treatment in the setting of diabetes, immunosuppression, or systemic signs of infection such as fever, in fact systemic antibiotic administration is not indicated in patients with a cutaneous odontogenic sinus tract who have a competent immune system. (20)

After the eradication of the original source of infection, the sinus tract regularly disappears within 7 to 14 days after root canal treatment. (21)

In this case, the closure of sinus tract and the healing were seen 1 month later.

Root-canal therapy is the treatment of choice if the tooth is restorable. Once the tooth is treated, the need for surgical excision is controversial. Some reports have indicated a complete excision of the sinus tract lining, while others have

suggested that surgical treatment and antibiotic therapy are not necessary after dental treatment (19,22).

Root canal irrigation is a critical step on the success of root canal therapy because of the bactericidal action and elimination of necrotic tissue by the sodium hypochlorite. This step is usually followed by an intracanal medication with Calcium hydroxide for its antimicrobial effects due to its high alkalinity; it has a destructive effect on cell membranes and protein structures, and stimulation of osseous repair. (23)

Clinical and radiological follow up should be regularly performed to detect the absence of healing and the persistence of peri apical lesion.

In this report, the extraction was indicated since that the tooth 46 was non-restorable, thus the extraction was associated to the enucleation of the radicular cyst as well as the simultaneous surgical excision of the sinus.

The antibiotic indication, in this case, is due to the heaviness of surgery following cyst enucleation.

In some cases, plastic surgery may be needed at a later step if healing results in cutaneous retraction (16). Failure of a cutaneous sinus tract to heal after adequate root canal therapy or extraction requires further evaluation, microbiological sampling and biopsy (24).

## CONCLUSION

This report highlights the importance of considering dental infection as a primary etiology in chronic cutaneous oro-cervico-facial sinus tracts.

Early correct diagnosis, based on radiographic evidence of a periapical root infection and treatment of these lesions can spare patient numerous unnecessary and ineffective antibiotic therapy or plastic surgical treatment, reducing the possibility of further complications.

## Competing interests

Authors declare no competing interest.

Patient Consent Form

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Hereby, I Dorsaf Touil, consciously assure that for the manuscript :

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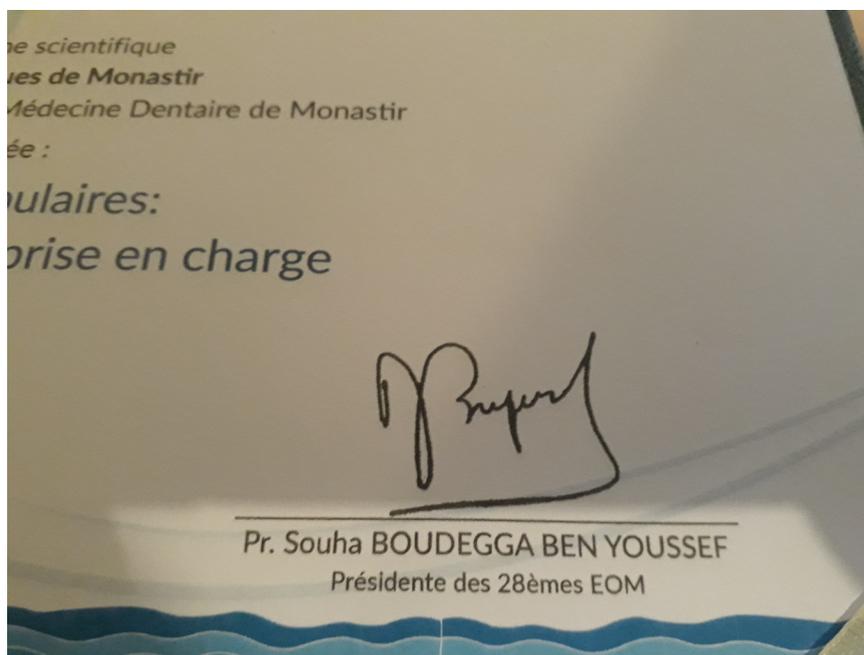
, the following is fulfilled:

1. This material is the authors' own original work, which has not been previously published elsewhere.
2. ethics committee that approved the study and confirmation that the study conforms to recognized standards is required
3. The paper is not currently being considered for publication elsewhere.
4. The paper reflects the authors' own research and analysis in a truthful and complete manner.
5. The paper properly credits the meaningful contributions of co-authors and co-researchers.
6. All sources used are properly disclosed.
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The violation of the Ethical Statement rules may result in severe consequences.

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