

## Surgical Management of a Cutaneous Sinus Tract: A Case Report and Review of the Literature

Ahmed Chkoura, DDS; Wafaa Elwady, DDS; Bouchra Taleb, DDS

### Abstract

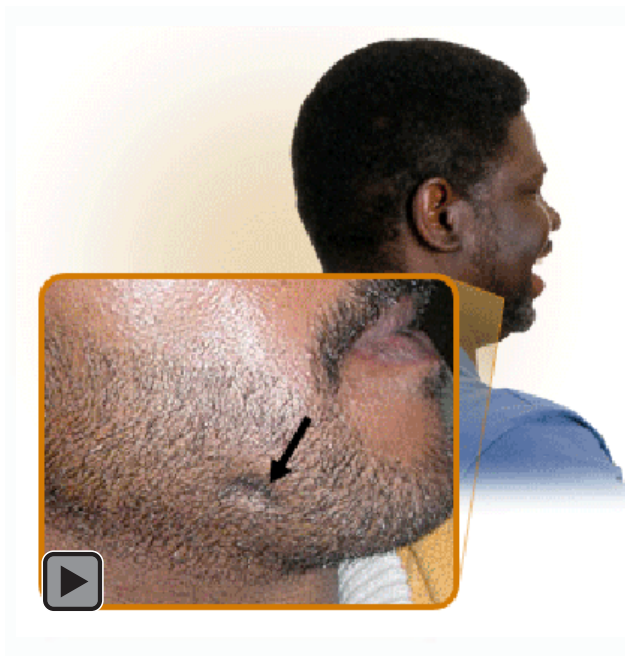
**Aim:** The purpose of this paper is to present a case involving the surgical management of a cutaneous sinus tract and a literature review.

**Background:** A cutaneous sinus tract of dental origin may easily be misdiagnosed. Exact diagnosis is necessary in the management of this pathological situation.

**Case Description:** A healthy 40-year-old man presented with a dimple in the skin of his right cheek. Upon further examination, the clinical crown of the mandibular right first molar was missing, leaving only the roots visible. Palpation of the affected area revealed a cord-like tract that was surgically excised.

**Summary:** A cutaneous sinus tract of dental origin is a canal that drains the infection from a dental source to the face or neck. A misdiagnosis of these lesions could lead to an ineffective and inappropriate treatment. We report a case of a cutaneous sinus tract of dental origin that we removed from the periapical zone of the causal teeth. The aim of this paper is to present a dental and medical literature review of cutaneous sinus tract that has a dental origin and to report a case where the sinus tract was surgically eliminated. Patients with a cutaneous facial sinus tract of dental origin often do not have obvious dental symptoms that can lead to misdiagnosing this pathological situation.

**Clinical Significance:** Elimination of the source of infection by endodontic treatment or tooth



removal generally results in resolution of the sinus tract. But in the case of an older sinus tract, wound contraction and scar tissue formation may require surgical management to excise the cord-like tract.

**Keywords:** Dental sinus, odontogenic infections, sinus track

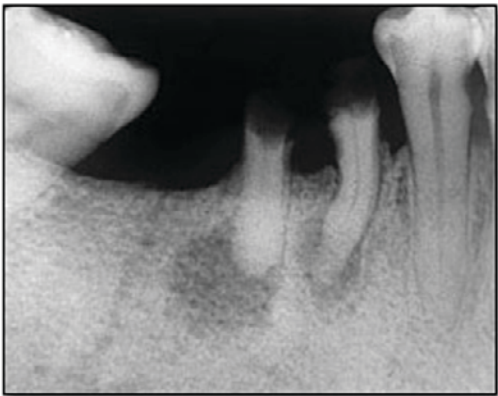
**Citation:** Chkoura A, Elwady W, Taleb B. Surgical Management of a Cutaneous Sinus Tract: A Case Report and Review of the Literature. *J Contemp Dent Pract* [Internet]. 2010 October; 11(5):049-055. Available from: <http://www.thejcdp.com/journal/view/volume11-issue5-chkoura>

## Introduction

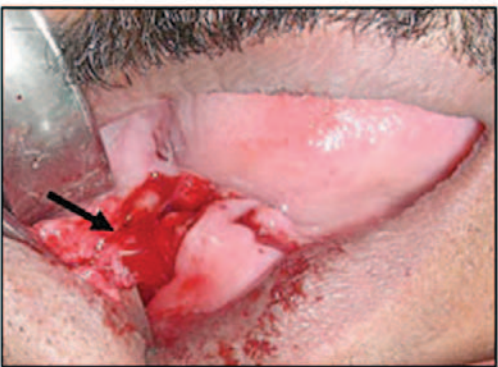
A cutaneous sinus tract of dental origin is relatively uncommon and, therefore, may be misdiagnosed by some nondental health professionals. Specific dental symptoms may not be readily apparent, so



**Figure 1.** Dimple in the skin of the right cheek.



**Figure 2.** Periapical radiograph showing the residual roots for the mandibular right first molar with apical radiolucencies.



**Figure 3.** A cord-like tract was revealed after reflection of a mucoperiosteal flap.

patients may first visit a physician for evaluation and treatment.<sup>1</sup> A review of several reported cases revealed that patients may undergo multiple biopsies and surgical excisions, radiotherapy, and multiple regimens of antibiotic therapy, all of which fail due to recurrence of the cutaneous sinus tract because the primary dental etiology was never correctly diagnosed or addressed.<sup>2-6</sup> Some patients have even received cancer-directed therapy before having lesions correctly diagnosed.<sup>2</sup> When sinus tracts form, they are most commonly found on the chin or submandibular area.<sup>1</sup>

## Case Report

An otherwise healthy 40-year-old male patient presented to the Dental Hospital of Faculty of Rabat for extraction of grossly carious teeth and for treatment of a skin dimpling in the right cheek (Figure 1).

An oral examination revealed several grossly carious teeth with only the roots were present, so radiographs were ordered. The radiograph of the mandibular right first molar revealed periapical radiolucencies associated with apical regions of the roots (Figure 2). Palpation of the first right mandibular molar area also revealed a cord-like tract attached to the underlying alveolar bone. These findings led to a diagnosis of chronic apical periodontitis caused by pulpal necrosis, which led to the development of a cutaneous sinus tract on the right side of the face.

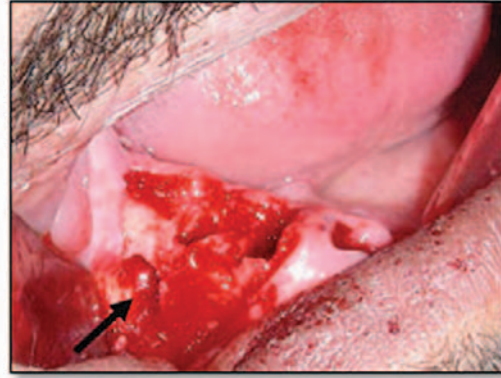
After extraction of the roots, reflection of a mucoperiosteal flap revealed a cord-like tract attached to the bone in the periapical region (Figure 3).

Consequently, the area was dissected to surgically remove the cord-like tract (Figures 4 and 5).

The part of the tract attached to the bone was released, revealing an area of bone loss (Figure 6). Immediately after the excision of the sinus tract, the skin was undermined to relax the affected area and restore normal facial contour (Figure 7). Histopathological examination confirmed the initial diagnosis and found that the tract was lined with epithelium.



**Figure 4.** The cord-like tract was surgically excised from its origin to the skin.



**Figure 6.** An area of bone loss was visible after elimination of the cord-like tract.



**Figure 5.** The excised cord-like tract.



**Figure 7.** Relaxation of the skin after the excision of the cord-like tract led to the restoration of normal facial contours.

## Discussion

Cutaneous sinus tracts of dental origin have been well documented in both the medical literature<sup>1-9</sup> and the dental literature.<sup>10-17</sup> However, these lesions can present a diagnostic challenge<sup>2</sup> because these tracts often have a clinical appearance similar to other facial lesions and are relatively uncommon.<sup>18</sup>

Inflammatory degeneration of the pulp, periodontal membrane, or dental follicle may slowly track through the cancellous bone following the path of least resistance and perforate the cortical plate to present either intra- or extraorally. Once exudate has entered the soft tissue, its direction of spread is limited by muscles and fascial planes, which tend to direct the infection towards certain defined areas where it can accumulate. The muscles that commonly play a useful part in containing an infection around the maxilla and mandible are the mylohyoid, buccinator, masseter, medial pterygoid, and superior constrictors. If the apices of the

teeth are above the maxillary muscle attachments and below the mandibular muscle attachments, the spread of infection may be extraoral.<sup>19</sup> When tracts do form, they tend to arise more frequently from infected mandibular teeth (80 percent) than maxillary teeth (20 percent). Hence, sinus tracts are more common in the submandibular or submental regions of the face than anywhere else.<sup>18</sup>

Although most patients' cutaneous sinus tracts of dental origin may not have any apparent dental symptoms, careful questioning of the patient about past symptoms may help practitioners identify a dental etiology. A history of a toothache in the affected area that resolved without dental intervention can be useful information. It is important, however, to note that not all cases may have a history of a dental problem.<sup>1</sup> Clinically, a cutaneous dental sinus tract may resemble a pimple, ulcer, nodule, or indurated cystic area.<sup>18</sup>

Dental etiology can be confirmed by tracing the sinus tract to its origin with gutta-percha or similar

radiopaque material, by radiographic examination, and by pulp vitality testing.<sup>1</sup> An oral examination may reveal one or more severely carious teeth or a healthy-looking tooth with an intact crown with an endodontic lesion. Pulpal and periradicular diagnostic testing should be performed on the suspect tooth and adjacent teeth. More than one tooth may be pulpally involved and associated with the cutaneous odontogenic sinus tract.<sup>2</sup> Panoramic radiographs can be useful in the initial screening for suspected dental pathology. Intraoral periapical radiographs, however, are more useful in arriving at a specific diagnosis.<sup>1</sup>

The differential diagnosis should include traumatic lesions, fungal and bacterial infections, neoplasms, presence of a foreign body, local skin infections (carbuncle and infected epidermoid cyst), pyogenic granuloma, 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.<sup>2</sup>

Root-canal therapy is the treatment of choice if the tooth is restorable. Extraction is indicated for nonrestorable teeth. Once the primary odontogenic etiology has been properly eliminated or removed, the sinus tract and cutaneous lesion usually resolve within a few weeks without treatment.<sup>2</sup>

In the case of a chronic odontogenic sinus tract, extraction of the causal tooth may not be sufficient for complete healing to occur. In those cases, the cord-like tract must be eliminated. It can be either cut from its insertion (attachment) to the underlying alveolar bone or removed by complete excision.<sup>19</sup> In this case report, the cord was removed from its origin to the point of skin attachment, which allowed relaxation of the facial skin, elimination of the skin dimpling in the affected area, and restoration of normal facial contours.

Biopsy alone should be avoided as it may lead to exacerbation of infection or scarring. Antibiotic therapy is indicated when there are signs of systemic involvement (e.g., fever or lymphadenopathy).<sup>19</sup>

## Summary

A cutaneous dental sinus tract is a canal that drains purulence from a dental source to the face or neck. A misdiagnosis of these lesions can lead to ineffective and inappropriate treatment. This report describes a case involving a cutaneous sinus tract of dental origin that required surgical removal of the sinus tract from the periapical zone of the causal teeth. The aim of this paper is to present a dental and medical literature review of cutaneous sinus tract with a dental origin and to present the surgical technique used to eliminate the cord-like tract.

## Clinical Significance

Elimination of the source of infection by endodontic treatment or tooth removal generally results in resolution of the sinus tract. But in the case of an older sinus tract, wound contraction and scar tissue formation may require surgical management to excise the cord-like tract.

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