

## Cutaneous odontogenic sinus tract to the chin: a case report

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### Summary

**We report a case of cutaneous odontogenic sinus tract to the chin. The patient first noticed the cutaneous condition in 1977. Inappropriate medical and dental treatment was ineffective. Correct diagnosis and treatment was completed in 1993. We offer diagnostic and treatment guidelines for the management of similar cases.**

**Keywords:** cutaneous, odontogenic, sinus tracts

### Introduction

Cutaneous sinus tracts of dental origin have been well documented in the medical literature (Lewin-Epstein *et al.* 1978; Kaban 1980; Spear *et al.* 1983; Cioffi *et al.* 1986; Held *et al.* 1989; Hodges *et al.* 1989; Cohen & Eliezri 1990) and the dental literature (Bernick & Jensen 1969; Strader & Seda 1971; Sakimoto & Stratigos 1973; Braun & Lehman 1981; Sharma & Chauchan 1985; McWalter *et al.* 1988; Maple & Eichel 1993; Caliskan *et al.* 1995). However, these lesions continue to be a diagnostic dilemma. A review of several reported cases reveals that patients have had multiple surgical excisions, radiotherapy, multiple biopsies, and multiple antibiotic regimens, all of which have failed, with recurrence of the cutaneous sinus tract, because the primary dental aetiology was never correctly diagnosed or addressed. Others received cancer-directed therapy before having lesions correctly diagnosed (Sakimoto & Seratigos 1973; McWalter *et al.* 1988; Held *et al.* 1989; Hodges *et al.* 1989).

The history of the patient whose case is described here shows that cutaneous odontogenic sinus tracts are still being misdiagnosed and that treatment applied is inappropriate. The case illustrates the need for coopera-

tive diagnostic referrals between physicians and dentists, and highlights the need for thorough diagnostic procedures that should always include a dental examination. The clinician should recognize that a cutaneous sinus tract is a sequel to pathosis, while the associated nonvital tooth, with its periradicular periodontitis, is the primary cause (Braun & Lehman 1981).

The purposes of this paper are to report a case of a cutaneous odontogenic sinus tract and to provide diagnostic guidelines, treatment guidelines, and data associated with reported cases.

### Case report

A 37-year-old Filipino male attended the Baylor College of Dentistry with a chief complaint of periodic tenderness associated with his mandibular left canine. The mandibular central incisors and lateral incisors were missing. His medical history was not significant. A nodulocystic cutaneous lesion in the midline of his chin was immediately noted. The patient stated that he had first noticed the cutaneous lesion in 1977, and in 1987 had sought treatment from a physician. The physician prescribed soaking with epsom salt (magnesium sulphate) and also antibiotics but the lesion persisted. In 1989, the patient sought treatment from a dentist because of pain in the mandibular anterior region. The dentist, according to the patient, took no diagnostic radiographs and performed no pulpal or periradicular tests but extracted the mandibular central and lateral incisors on two separate visits, on the basis that those teeth were associated with the patient's cutaneous lesion. The lesion persisted, and in 1992 the patient again sought treatment from a physician, who prescribed antibiotics and performed enucleative surgery. The nodule returned. This time the physician tried chemical burn therapy but this also failed and the nodule developed again.

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The cutaneous lesion and draining sinus tract thus persisted from 1977 until the patient received a correct diagnosis and appropriate treatment of the primary aetiology at the Baylor College of Dentistry in 1993. A cord-like tract, palpable in the underlying tissues felt attached to the mandible. During palpation, a purulent discharge was expressed from the cutaneous nodule.

Radiographic examination revealed a periradicular radiolucency associated with the mandibular left canine. The tooth was slightly tender to percussion. The alveolar mucosa adjacent to the tooth was not tender to palpation. Sensitivity testing of the crown of the tooth by ice revealed no pulpal response, which indicated a necrotic pulp; this was confirmed at the start of root-canal therapy. The patient could remember no previous trauma or other possible precipitants of his dental problem.

A diagnosis was made of necrotic pulp, with chronic suppurative periradicular periodontitis and cutaneous drainage (Figs. 1 and 2). Root canal therapy was completed and the endodontic access properly restored. When the patient attended for follow-up 3 months later the cutaneous lesion had healed without surgical treatment (Fig. 3), and a radiograph showed resolution of the periradicular radiolucency. The patient was symptom free.

## Discussion

### Diagnostic guidelines

Evaluation of a cutaneous sinus tract must begin with a thorough history and awareness that any cutaneous lesion of the face and neck could be of dental origin (Lewin-Epstein *et al.* 1978; Cioffi *et al.* 1986; Cohen & Eliezri 1990). Patients may not remember an acute or painful onset and the cutaneous tract and lesion are seldom accompanied by symptoms from the oral cavity (Cioffi *et al.* 1986; McWalter *et al.* 1988; Cohen & Eliezri 1990). Cutaneous retraction or dimpling is because of fixation of the tract with the underlying tissues.

Palpation of the tissues surrounding the sinus tract should reveal a cord-like tract attached to the underlying alveolar bone in the area of the suspect tooth. During palpation, an attempt should be made to 'milk' the sinus tract; production of a purulent discharge confirms the presence of a tract (Cohen & Eliezri 1990).

If the sinus tract is patent, a lacrimal probe or a gutta-percha cone can be used to trace its track from the cutaneous orifice to the point of origin, which is usually a nonvital tooth (Sakimoto & Stratigos 1973; Mitchell



Fig. 1 Nodulocystic cutaneous lesion in the chin of 16 years duration, in a 37-year-old male.



Fig. 2 Resolution of a cutaneous odontogenic lesion 3 months after diagnosis and treatment of a cutaneous odontogenic sinus tract. Note the residual scar tissue from previous medical treatment.

1994), but in edentulous patients could be a retained tooth fragment, an impacted tooth or an odontogenic cyst (Hodges *et al.* 1989). A radiograph is then exposed with the probe in situ, pointing to the origin of the primary pathosis. Oral examination may reveal one or more severely decayed teeth or a healthy looking tooth with an intact crown.

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. The pathophysiology of the development of a cutaneous odontogenic sinus tract has been well documented (Cioffi *et al.* 1986; McWalter *et al.* 1988; Hodges *et al.* 1989; Cohen & Eliezri 1990).

The differential diagnosis should include traumatic lesions, fungal and bacterial infections, neoplasms (Kaban 1980; Spear *et al.* 1983; Cioffi *et al.* 1986),



Fig. 3 Diagnostic preoperative radiograph of mandibular left canine showing periapical radiolucency associated with a cutaneous odontogenic sinus tract.

presence of a foreign body, local skin infection (carbuncle and infected epidermoid cyst) (Kaban 1980; Cioffi *et al.* 1986), pyogenic granuloma (Spear *et al.* 1983; Cioffi *et al.* 1986), chronic tuberculosis lesion (Lewin-Epstein *et al.* 1978; Kaban 1980; Braun & Lehman 1981; Cioffi *et al.* 1986), osteomyelitis (Braun & Lehman 1981; Cioffi *et al.* 1986), actinomycosis (Lewin-Epstein *et al.* 1978; Spear *et al.* 1983; Cioffi *et al.* 1986), and gumma of tertiary syphilis (Cioffi *et al.* 1986). 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 (Lewin-Epstein *et al.* 1978; Cioffi *et al.* 1986).

#### Treatment guidelines

Root-canal therapy is the treatment of choice if the tooth is restorable (Hodges *et al.* 1989; Cohen & Eliezri 1990). Extraction is indicated for nonrestorable teeth. Once the primary odontogenic aetiology has been properly eliminated or removed, the sinus tract and cutaneous lesion usually resolve within a few weeks without treatment, which includes no antibiotic therapy (Lewin-Epstein *et al.* 1978; Spear *et al.* 1983; Cioffi *et al.* 1986; McWalter *et al.* 1988; Cohen & Eliezri 1990; Caliskan *et al.* 1995).

Histologically, these tracts are composed of fragments of granulation tissue, which are often focally lined by stratified squamous epithelium. Healing occurs by

secondary intention in most cases (Sakimoto & Stratigos 1973; Lewin-Epstein *et al.* 1978; McWalter *et al.* 1988). Cosmetic surgical treatment may be required later if the area heals with a residual tract that results in cutaneous retraction or dimpling (Lewin-Epstein *et al.* 1978; Braun & Lehman 1981; Spear *et al.* 1983; Cioffi *et al.* 1986; McWalter *et al.* 1988; Cohen & Eliezri 1990). If a sinus tract does not close after appropriate removal of the primary aetiology, the most common alternative cause is actinomycosis (Braun & Lehman 1981).

A cutaneous odontogenic sinus tract is a localized entity and is not an indication for antibiotics (Braun & Lehman 1981; Spear *et al.* 1983; Cioffi *et al.* 1986; McWalter *et al.* 1988; Hodges *et al.* 1989; Cohen & Eliezri 1990). Systemic antibiotic administration is neither necessary nor recommended in patients with a cutaneous odontogenic sinus tracts who have an intact immune system, no sign or symptoms of systemic involvement, and no other systemic condition that requires prophylactic antibiotic cover. These patients are usually healthy. The sinus tract prevents swelling or pain from pressure build-up because it provides drainage of the odontogenic primary site (McWalter *et al.* 1988). Thus, the draining sinus tract maintains a localized condition and prevents systemic involvement. Exudate from cutaneous odontogenic sinus tracts has been cultured and the microbial flora identified (Caliskan *et al.* 1995), but there is usually no systemic involvement. Culturing has been used to rule out fungal or syphilitic infections (Sakimoto & Stratigos 1973).

#### Notes from cases reviewed

We have compiled some interesting data from the cases reviewed. The youngest individual reported to have a cutaneous odontogenic sinus tract was a boy aged 10 months (Cohen & Eliezri 1990) and the oldest was 110 years of age (Cioffi *et al.* 1986). The cutaneous lesion may develop as early as a few weeks (Spear *et al.* 1983) or as late as 30 years (Cohen & Eliezri 1990). Most patients are unaware of an associated dental problem (Cioffi *et al.* 1986; Hodges *et al.* 1989; Caliskan *et al.* 1995), thus delaying the correct diagnosis of the cutaneous lesion with its primary odontogenic origin. One case was correctly diagnosed only after 32 years (Bernick & Jensen 1969). The involved area is usually symptom free and the patient usually healthy (Cohen & Eliezri 1981). Edentulous patients may develop cutaneous odontogenic sinus tracts from a retained tooth fragment, impacted teeth, or an odontogenic cyst (Hodges *et al.* 1989).

Only 50% of patients with cutaneous odontogenic sinus tracts have a history of toothache. Of reported cases, 80% involved mandibular teeth of which half were anterior teeth, producing sinus tracts in the submental and chin sites (Hodges *et al.* 1989). Other sites of extra-oral drainage of odontogenic origin are the cheek, canine space, nasolabial fold, nose, upper lip, and inner canthus of the eye (Cioffi *et al.* 1986; McWalter *et al.* 1988; Hodges *et al.* 1989; Cohen & Eliezri 1990). Cutaneous sinus tracts in the mandibular, submandibular and neck areas are most often associated with diseased mandibular molars (Cioffi *et al.* 1986).

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