

Odontogenic Cutaneous Sinus Tracts: A Clinician's Dilemma

Abstract

Background: Odontogenic cutaneous sinus tract (OCST) is one of the rare manifestations of chronic dental infections. Although well reported in literature, it is often misdiagnosed or under diagnosed. Apart from isolated case reports especially in dental literature there is a paucity of comprehensive case series on OCST. **Aims and Objectives:** We undertook this study to observe the prevalence, clinico-epidemiological features and management issues in these patients from a dermatological perspective. **Methods:** A retrospective study was undertaken analyzing the clinical records of patients registered at our outpatient department (OPD) from 2011 to 2018. Cases with a clinical and radiological diagnosis of odontogenic cutaneous sinus were included in the study. We studied the following variables: frequency, gender, age, localization, morphology, mean time of evolution and treatment response. **Results:** 21 patients with OCST were identified from our records. Females outnumbered males; patients in the age group between 31-40 years were more commonly affected. Three morphological presentations were noted in the form of flesh-colored dry nodules with sinus, adherent plaques with mucopurulent discharge and ulcer. Posterior set of teeth were commonly affected and mandible was the commonest site for location of sinus. The time taken for appropriate diagnosis in these cases ranged from 7-16 months. Almost all the patients responded to endodontal or root canal treatment and there were no recurrences. **Conclusion:** A CST of dental origin is often a diagnostic challenge, especially in cases with minimal or no dental symptoms. A thorough skin and dental examination is required for sinuses on the head and neck area with a high index of suspicion for OCST. Most cases respond to conservative, root canal therapy. An early diagnosis can save the patient from unnecessary and ineffective therapies and sometimes surgeries.

Keywords: Facial sinus, investigations, odontogenic sinus, pulp necrosis, root canal

Introduction

Chronic periapical abscess generally arises from bacterial invasion (periodontal or direct infection), chemical irritation, or trauma. The commonest etiology is carious exposure and subsequent bacterial invasion of the tooth pulp. Chronic periapical infection occasionally progresses to sinus tract formation which eventually emerges beneath the skin surface. Despite the fact that odontogenic cutaneous sinus tracts (OCST) are well documented, this condition still remains commonly misdiagnosed.^[1] These sinus tracts often pose a diagnostic challenge even to the most trained dermatologist especially in the absence of dental symptoms in more than half of the patients.

These patients often present to the dermatologists, ENT surgeons, plastic surgeons or general physicians and

many times undergo multiple biopsies, unwanted investigations or surgical excisions prior to being recognized as OCST. A literature review revealed many isolated case reports,^[2,3] but a dearth of a comprehensive case series on OCST.^[4-6] In this study, we share our nine year experience and delineate clinico-epidemiological characteristics of patients with OCST.

Methods

A retrospective study was undertaken analyzing the clinical records of patients registered at our outpatient department (OPD) from 2011 to 2018. We only included those patients where the diagnosis of OCST was confirmed by clinical and radiological investigation. 21 cases of OCST were seen during this period. All patients primarily presented to us with a single non healing papulonodular or as an infiltrated adherent plaque lesion over face in which the sinus opening was

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dry, crusted or draining pus. Data was collected regarding age, sex, site of lesion, duration of illness, etiology, tooth involved and treatment outcome. Once OCST was suspected, all patients were referred to dental OPD for further confirmation and necessary treatment.

Results

Amongst the 21 OCST cases, 12 were males and 9 females, with a male:female ratio of 1.3:1. Majority of the patients were in the age group of 31-40 years including seven children (aged 8-15 years). The duration of illness ranged from 1.2 years to 4 years (average 3.6 years). None of the cases came with a referral clinical diagnosis OCST, and all cases had been diagnosed and treated on lines of differential diagnosis like actinomycosis, cutaneous tuberculosis, atypical mycobacterial infection, furuncle, leishmaniasis, etc.

Only 9 out of 21 patients gave symptoms suggestive of dental aetiology prior to the development of OCST in the form of tooth ache, fever and swelling of the gums adjoining the affected tooth. Of these, 4 patients had mild symptoms whereas the remaining 5 had high grade fever along with local pain and swelling for which they had been treated with oral antibiotics and analgesics.

Three types of skin lesions were observed: the flesh-colored or erythematous single nodular lesion, with an underlying sinus was noted in 12 (57.14%) patients, [Figure 1] whereas 7 (33.33%) had an indurated adherent plaque with sinus discharging pus and mucoid material [Figure 2] and 2 patients had ulcers. The most common location of OCST was mandibular area (8;38.09%), and chin (4;19.04%) [Figure 3 and Table 1]. Cutaneous lesions were located in relation to affected posterior set of teeth (molars/premolars).

Detailed oral examination revealed 19 carious teeth in 15 out of 21 (71.4%) patients, amalgam filling of 5 teeth in 4 patients [Figure 4] and metallic capping of 2 teeth post root canal treatment (RCT) in 2 patients. Table 2 summarizes the number of teeth affected and secondary changes in the involved tooth. Extensive plaque formation and gingivitis was observed in 8 out of 15 patients with carious teeth. A cord like structure was palpated on clinical examination in a majority (17/21) of patients.

Twelve patients were misdiagnosed in the past as scrofuloderma, atypical mycobacteria, basal cell carcinoma (BCC), investigated and treated extensively prior to presenting to us. The patient diagnosed as BCC had lesion localized to the lateral side of left ala of the nose and had undergone local excision by surgeons, but the lesion promptly relapsed back after 6 months.

Skin biopsies from the lesions revealed only chronic non-specific inflammation. All patients were referred for dental consultation after suspecting OCST and on noting



Figure 1: Dry skin colored adherent nodular lesion over mandible



Figure 2: Adherent erythematous plaque with purulent discharge from sinus.



Figure 3: CST over mental area occurring close to scar of previously excised CST site

underlying carious tooth during careful oral examination on subsequent visits. All these patients underwent dental panoramic radiography to determine the origin of sinus, which revealed periapical lucency suggestive of a

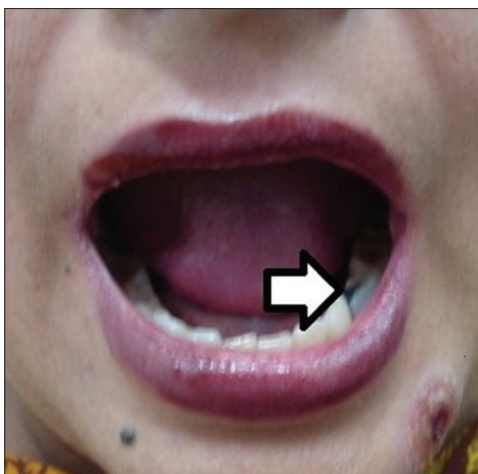


Figure 4: Oral examination showing amalgam treated tooth adjacent to the CST

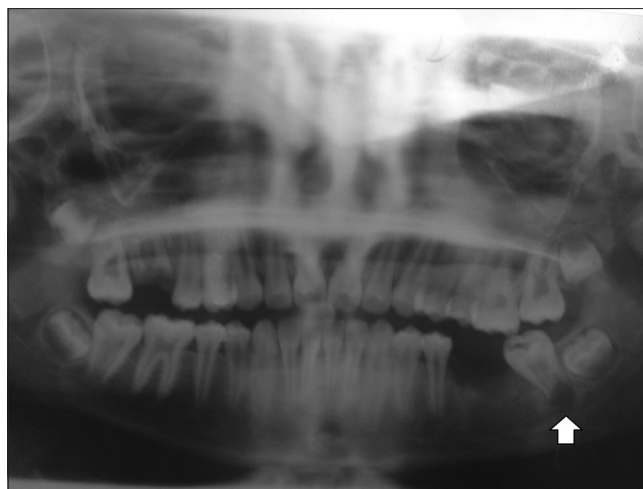


Figure 5: Dental panoramic radiography revealing radiolucent area in relation to molar tooth

Table 1: Location and morphology of the lesions in the cohort

Location and morphology	No. of patients (percentage)
Chin	4 (19.04%)
Cheeks	2 (9.52%)
Mandibular area	8 (38.09%)
Neck (submandibular and submental)	4 (19.04%)
Paranasal area	3 (14.28%)
Total	21 (100)
Morphology	
Nodule with sinus	12 (57.14%)
Indurated adherent plaque with discharging sinus	7 (33.33%)
Ulcer	2 (9.52%)
Total	21 (100%)

Table 2: Type and number of teeth affected

Name of teeth	Number of patients	Number of teeth affected	Secondary changes noticed in affected tooth associated with the sinus (No. of patients)
Incisors	3	4	amalgam filling (2), caries tooth (1)
Canine	1	1	caries tooth (1)
Premolars	4	6	caries (2), amalgam filling (2).
Molars	13	15	caries teeth (9), capped (2) amalgam filling (2).

periapical infection in the affected tooth [Figure 5]. Pus culture from the discharge often revealed a mixed flora.

Extraction of the affected tooth was performed in 11 patients, which included all patients with metal capped tooth and those with amalgam filling, while the remaining underwent root canal therapy. Lesions promptly healed as early as 3 weeks following corrective treatment of the affected tooth and there was no recurrence of cutaneous lesions during 6 months of follow-up. Surgical excision of the sinus tract was not performed in any of the patients. A cosmetically better result was obtained in patients with nodular form of OCST with minimal scarring, while those

with infiltrated plaques displayed a post inflammatory puckered scar.

Discussion

OCST typically appears secondary to periapical abscess that results from pulp and periodontal membrane degeneration by inflammation. The prevalence of OCST varies from isolated case reports to 14.7% in large reported series.^[4-6] The inflammatory process starts at the necrotic pulp and spreads into the surrounding periodontal ligament leading to local alveolar bone resorption. Subsequently, the inflammation spreads peripherally till the cortex of the bone is destroyed forming a local subperiosteal abscess, which later pierces the periosteum to open as an intraoral sinus or OCST depending on local factors like gravity, virulence of the infecting microorganisms and anatomy of the adjacent facial muscle attachments.^[7]

The point of abscess drainage depends on the location of the apex of infected tooth in relation to the muscular attachments on maxilla and mandible. It follows the path of least resistance. Apical infections contiguous with muscular attachments manifest as intraoral and those further away manifest as extraoral OCST. In this study, all patients had extraoral OCST.

In 80% of reported cases, mandibular teeth involvement is commonly noted followed by the maxillary teeth involvement,^[4,5] similarly, in our case series 20/21 patients had underlying mandibular teeth involvement. Sadeghi *et al.*^[6] in a series of 728 endodontically treated cases noted a higher prevalence of OCST in 10-19 year age group and presence of sinus tract predominantly in the mandible. We found that patients aged 31-40 years were common. OCST rarely involves nose, nasolabial folds and inner canthus of the eye.^[8,9]

OCST are often misdiagnosed and majority of the times these patients come to a dermatologist with a skin nodule, ulcer or scar and don't remember or give history of dental symptoms

prior to the onset of skin lesions.^[10,11] The differential diagnosis of such lesions includes foreign body reactions, pyogenic granuloma, squamous cell carcinoma, osteomyelitis, actinomycosis, basal cell carcinoma, salivary gland fistula, infected cyst and deep fungal infections. However, a high index of suspicion and prompt dental evaluation by dental panoramic radiography (orthopantomography), intraoral periapical radiographic examination, placement of a gutta-percha point, and dental computerized tomography and pulp vitality testing are important in diagnosis of OCST. Definitive treatment requires total elimination of the source of infection by root canal therapy in case of restorable tooth or by extraction in case of non-restorable tooth, along with complete excision of sinus tract lining.^[11] Aggressive debridement should be avoided due to the risk of subsequent recurrence and sequelae. The response to treatment is dramatic and gratifying.

Potential complications of OCST includes contiguous spread of infection to adjacent tooth and bone to form satellite cysts, if left untreated it can lead to serious complications like Ludwig's angina, mandibular osteomyelitis, maxillary sinusitis and orbital abscess and septicemia.^[12] However these serious complications are seen in patients with depressed immune system like poorly controlled diabetes, malnutrition, cancer or chemotherapy etc.^[12]

Conclusion

Diagnosing OCST can be challenging as it is always difficult to suspect unless the treating clinician considers the possibility of dental origin for these lesions. Many patients are unaware of lesions arising secondary to dental pathology, as a result of which they present themselves to a dermatologist. Without adequate knowledge and cognizance, the diagnosis of OCST is needlessly delayed and patients are subjected to unwanted investigations, surgeries and mental agony. A thorough diagnosis requires cooperative referrals between physicians, dermatologist, surgeons, and dentists. Recognition of its true nature facilitates prompt treatment, minimizes patient discomfort and esthetic problems and reduces the possibility of further complications.

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Conflicts of interest

There are no conflicts of interest.

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