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Significance of Correct Diagnosis of Odontogenic Extra-Oral Sinus: A Report of Two Cases

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Cutaneous draining sinus tracts of odontogenic origin often are a diagnostic challenge. A delay in correctly diagnosing these types of lesions can result in unnecessary antibiotic therapy and surgical treatment. This case report presents the clinical course of two cases with extra-oral sinus tract formation, from diagnosis and treatment to short-term follow-up and evaluation. These facial lesions were initially misdiagnosed as lesions of non-odontogenic origin. Later on an odontogenic cause was identified and endodontic intervention resulted in resolution of the problem, confirming the initial misdiagnosis.

KEYWORDS: Endodontic treatment, Extraoral sinus, Odontogenic

INTRODUCTION

A sinus tract refers to a drainage duct for the suppuration produced by abscesses.¹ A sinus tract of endodontic origin is caused by pulp necrosis secondary to caries or trauma followed by invasion of microorganisms causing periapical inflammation of the affected tooth. The suppuration from the periapical inflammatory process then follows the path of least resistance creating trajectories which spread through the bone marrow, periosteum, loose connective tissue among the fascial planes, and finally drain onto the epithelial tissue through either a mucosal or, occasionally, a cutaneous sinus tract.^{2,3}

Cutaneous draining sinus tracts of odontogenic origin often are a diagnostic challenge. Careful search of medical and dental literature reveals the incidences of frequent misdiagnosis of these lesions rendering unnecessary long term antibiotic therapy and dermatological surgical interventions to the patients.^{4,5} Patient with cutaneous sinus tract typically first visits a physician for evaluation and treatment in lieu of the lack of specific dental symptoms. The differential diagnoses includes suppurative apical periodontitis, infected cyst, osteomyelitis, traumatic lesion, congenital fistula, salivary gland fistula, myositis, pustule, furuncle, gumma of tertiary syphilis, chronic tuberculosis lesion, foreign-body lesion, squamous cell carcinoma, granulomatous disorder, and deep mycotic infection.

This clinical case report presents two patients with

cutaneous odontogenic sinus tracts that were initially misdiagnosed as facial skin lesions and underwent dermatological surgery and antimicrobial therapy. Later on correct diagnosis was established and lesion healed uneventfully with nonsurgical endodontic treatment.

CASE REPORT 1

A 32 year old female patient reported to the Department of Conservative Dentistry and Endodontics at Post Graduate Institute of Dental Sciences, Rohtak, with the chief complaint of a draining cutaneous lesion on the chin. Sinus had been present for ten months with intermittent pus discharge from it. Patient had undergone multiple cutaneous biopsies and long term antibiotic therapy from a dermatologist but with no sign of improvement after which, she sought another medical opinion and was referred to the dental department suspecting dental etiology. Dental history revealed a traumatic episode of lower incisors 3.5 years back. Extraoral examination revealed an erythematous symmetrical nodule approximately 1 cm in diameter on the midline of the chin below the inferior border of the mandible [Figure 1(a)]. The nodule was soft and elicited a bloody and purulent discharge on palpation.

On intraoral examination, teeth 31, 41 and 42 were slightly discolored and tender on percussion. There was no detectable mobility of these teeth and periodontal probing depths were within normal range. IOPA radiographic examination revealed diffuse 4 cm X 4 cm radiolucent defect

involving the root apices of 31, 32, 41 and 42 [Figure 1(b)]. Electric pulp test and heat test were performed on all mandibular teeth. Teeth 31, 32, 41 and 42 were non responsive and adjacent teeth were responsive to the stimuli. Thus a diagnosis of pulpal necrosis with chronic apical abscess with cutaneous draining sinus tract was made for these teeth. After local anaesthesia and rubber dam placement, root canal treatment was initiated with pulp chamber access and biomechanical preparation of the root canals using 0.06- taper K3 nickel-titanium rotary files (Sybron Endo, Orange, CA), size #40 to #20 in a crown-down technique. Irrigation during instrumentation was carried out with 1% sodium hypochlorite (Dermus, Florianópolis, SC, Brazil) and final irrigation with EDTA (Dermus, Florianópolis, SC, Brazil) irrigation. 2% CHX gel was inserted into the canal using lentulospirals. After 1 week, drainage from the sinus tract had ceased. The root canal medication was changed every week for 4 weeks after which canals were obturated with gutta-percha (Dentsply Tulsa Dental) and AH 26. During this period patient remained asymptomatic. After 1 year, there was a complete disappearance of sinus tract without any surgical treatment [Figure 2(a)] and complete radiographic healing of the periapical lesion [Figure 2(b)].

CASE REPORT 2

A healthy 38 year old male attended our department for the verification of a dental cause of his skin lesion as he remained symptomatic after undergoing two surgical interventions by a cosmetologist. Patient presented with an unaesthetic nodule on his right submandibular region however, with no drainage at the time of presentation [Figure 3(a)]. On history taking, patient confirmed the presence of intermittent pus drainage from this lesion and history of toothache in the mandibular right posterior region one year back which resolved by itself. Intraoral examination revealed the presence of a carious 47 which on radiographic examination revealed a diffuse periapical radiolucency [Figure 3(b)] which probably had caused the facial sinus tract. Thus diagnosis of pulp necrosis with chronic periradicular abscess and cutaneous draining sinus tract was established which was confirmed by the negative response to electric pulp test and cold stimuli. Root canal treatment was performed using standard protocol as in case 1 with intracanal

dressings of 2% CHX gel. Sinus tract healed uneventfully after root canal treatment [Figure 4(a)] and radiographic follow up showed signs of partial repair after 6 months [Figure 4(b)]. Patient is still on follow up with no signs of recurrence of cutaneous lesion.

DISCUSSION

Sinus tracts formation is a common sequelae of odontogenic infection. Slutzky-Goldberg et al.⁶ in their cohort study of 1,119 patients referred for endodontic consultation, reported that 108 patients (10.4%) with periradicular inflammation had sinus tracts, with chronic periapical abscess being the most prevalent diagnosed origin (71.3%). However, the most common location of these suppurative sinus tracts is intra-oral. Infrequently, these sinus tracts may also present extraorally. These cutaneous odontogenic sinus tracts are most commonly found on the chin or in the submandibular area.

Due to the chronic course of the disease, the local inflammation process spreads slowly through the alveolar bone either intraorally or extraorally following the path of least resistance. Once the cortical plate has been perforated, the direction of spread of infection and the exit point of sinus is determined by several factors such as which tooth is diseased, virulence of the microorganism, location of root apex in relation to muscle attachments and fascial sheaths.⁷

The sinus tract precludes any swelling or pain from pressure build-up because it provides continued drainage of the periradicular lesion.⁸ Many patients may not report toothache or other systemic symptoms, making the correct diagnosis difficult. Cutaneous sinus tracts usually cause discomfort to the patient due to frequent drainage on the face and an unpleasant aesthetic appearance due to which, patient tends to seek cosmetic dermatologic treatment initially. In the present cases, the lesions didn't respond to the antibiotic therapy for almost one year, after which a dental cause of the disease was suspected and patients were referred to the dental department. Detailed questioning of the patients revealed a history of toothache in second case in the affected area that resolved without treatment. Dental etiology was then confirmed by tracing the sinus tract to its origin with gutta-percha, by

radiographic examination and by pulp vitality testing. In the clinical cases described here, the radiographs clearly revealed periapical radiolucencies associated with a suspected tooth that did not respond to pulp sensibility tests.

A favorable outcome of the endodontic treatment of teeth with periapical pathology depends on effective control of the root canal infection.⁹ Ideally, an effective antimicrobial treatment protocol should be able to predictably render root canals free of bacteria so that the cause of periapical infection is eliminated. The most commonly used protocols involve the use of sodium hypochlorite (NaOCl) as an irrigant and calcium hydroxide (Ca(OH)₂) in inert vehicles as an intracanal medication. Although protocols using these substances have been shown to be effective in eliminating bacteria from infected canals, they have their own limitations. During the past decade, chlorhexidine (CHX) has received much attention as a potential root canal irrigant and intracanal medication. Recently, the antimicrobial effect on the outer root surface caused by the dentinal diffusion of an intracanal medicament over specific endodontic and periodontal pathogens revealed that 2% CHX gel has strongest antimicrobial effect.¹⁰ The combination of appropriate biomechanical preparation, a 1% sodium hypochlorite solution and an intracanal dressing of 2% CHX gel in these cases promoted a favourable environment for osseous repair, as well as soft tissue healing (resolution of the sinus tracts). With sinus tracts of odontogenic origin, spontaneous closure of the fistula can be expected within 5 to 14 days after root canal treatment or tooth extraction.^{3,4}

Both of the presented cases had been previously misdiagnosed as facial skin lesions and underwent multiple biopsies and long term antibiotic therapy. The closure of the extraoral sinus tract after nonsurgical root canal treatment confirmed the initial misdiagnosis and the dental origin of the skin lesions.

A close referral system between dermatologists and dentists therefore, must exist in cases of a cutaneous sinus tract to provide appropriate differential diagnosis and clinical care as early correct diagnosis can prevent unnecessary and

ineffective antibiotic therapy and/or surgical intervention.

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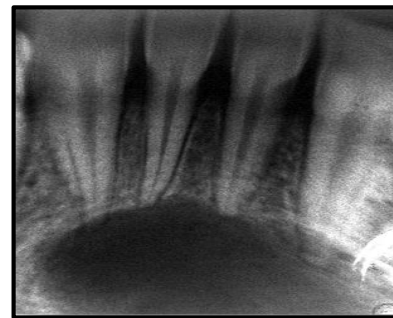
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LEGENDS

(a)



(b)

Figure 1. Pre-operative extraoral view of the sinus tract (a) and periapical radiograph of the suspected teeth (b).



(a)



(b)

Figure 2. Clinical (a) and radiographic follow up (b) after 1 year

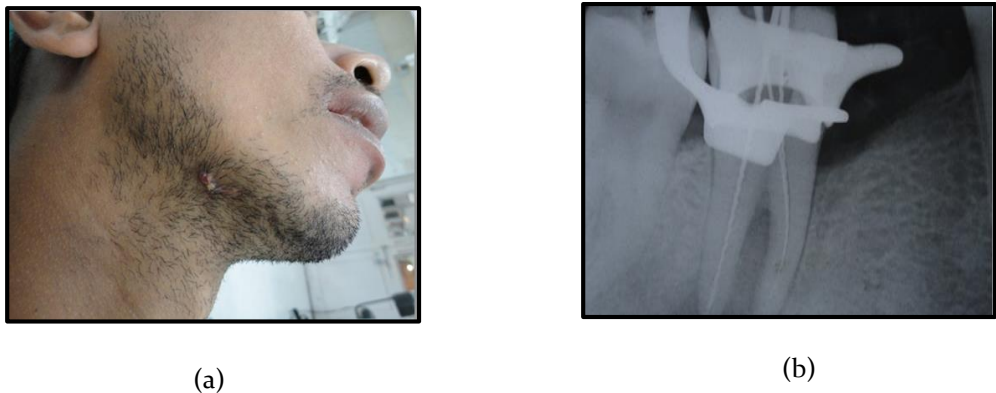


Figure 3. Pre-operative extraoral view of the sinus tract (a) and periapical radiograph of the suspected tooth during endodontic treatment (b)



Figure 4. Clinical (a) and radiographic follow up (b) after 6 months