Case Reports

Non surgical management of cutaneous sinus tract of odontogenic origin: A case report

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Cutaneous sinus tracts of dental origin are often initially misdiagnosed and inappropriately treated because of their uncommon occurrence and the absence of symptoms in approximately half the individuals affected. This paper reports a case describing the diagnosis and treatment of an extra-oral cutaneous sinus tract of odontogenic origin in relation to a mandibular left first molar. Non-surgical endodontic treatment was performed, and it resulted in resolution of the sinus tract and promoted peri-apical healing of the tooth involved.

Key words: Apical periodontitis, cutaneous sinus tract, necrosis pulp, non-surgical endodontic treatment.

INTRODUCTION

The sinus tract is defined as a channel leading from an enclosed area of inflammation to an epithelial surface. The opening of the sinus tract can be located either intraorally or extraorally (Cohenca et al., 2003). Cutaneous odontogenic sinus tracts of dental origin are uncommon. Although they have been well documented in the medical and dental literature, these lesions continue to be often misdiagnosed, challenging and pose a diagnostic dilemma (Cohenca et al., 2003; Susic et al., 2004). Studies revealed that the extra-oral sinus tracts are most commonly found on the cheek, chin and angle of the mandible (Slutzky-Goldberg et al., 2009; Magliocca et al., 2010; Vyys and Chaturvedi, 2011). Patients with cutaneous sinus tracts often undergo dermatological and other surgical interventions before being referred to the dentist. Therefore, all chronic draining sinus tracts of the face and neck signal the need of a thorough dental evaluation to avoid submitting patients to multiple biopsies, antibiotic regimens and unnecessary surgery (Brown et al., 2010; Kansal et al., 2013).

Most commonly, the etiology of odontogenic sinus tracts involves a chronic periradicular abscess (Cantatore et al., 2002; Patni et al., 2010; Qazi et al., 2006). These abscesses arise from bacterial invasion, chemical irritation or trauma. The most common initiating factor of the periapical abscess is carious exposure and subsequent bacterial invasion of the tooth pulp. The discharge of purulent exudates usually is associated with periapical radiolucent area and goes through tissues and structures along the path of least resistance (Kansal et al., 2013; Kell and Nahmias, 2007). The site of drainage can be located intra or extraorally, depending on certain circumstances such as the tooth which is diseased, and the apex position relatively to muscular attachments, bacterial virulence and lower host resistance (Pour et al., 2014; Sammut et al., 2013). The tracts occur more
frequently from peri-apical lesions caused by mandibular teeth (80%) than from those caused by maxillary teeth (20%), and this results in predominantly the appearance of cutaneous sinus tract of dental origin in the submental and submandibular regions. The tract rarely appears in the nasal region (Cantatore et al., 2002; Yuksel et al., 2010).

CASE REPORT

A healthy 18 year-old male was referred from the Department of Dermatology to the Department of Conservative Dentistry and Endodontic, EPS Farhat Hached (Sousse, Tunisia) to examine for possible dental infection. The patient was immediately put under double antibiotic therapy for 7 days (Amoxicillin 500 mg twice daily, Metronidazole 500 mg twice daily). The patient’s chief complaint was the appearance of an extra-oral nodulous growth on his left cheek close to the lower border of the mandible for the past 6 months. On extra-oral examination, there was a 1 × 1 cm raised erythematous mass on the inferior aspect of the cheek with a central fistula (Figure 1). The lesion was not fixed to the underlying mandibular basilar region. The intra-oral examination revealed that the lower left first molar had a carious lesion with exposed pulp associated to a vestibular swelling. The tooth was not tender on percussion; respond negatively to the pulp sensibility test with pain on palpation. No sign of mobility or periodontal pocket were present in relation to tooth 36. A peri-apical radiograph revealed a large and well-circumscribed periradicular radiolucency associated with tooth 36 (Figure 2). Thus, the diagnosis of pulp necrosis with chronic peri-apical periodontitis with cutaneous sinus tract was made.

Tooth 36 was isolated with rubber dam, and a standard access cavity was prepared. The root canals were cleaned and shaped using rotary nickel-titanium Protaper® instruments (DentsplyMaillefer) and copiously irrigated with 2.5% sodium hypochlorite and 17% EDTA. The working lengths were determined using electronic apex locator (Rootor, META BIOMED) and established working lengths were controlled radiographically (Figure 3). Calcium hydroxide paste (MM-Paste™, Micro-Mega, Besançon, France) was placed as an intracanal medication and the access cavity was sealed with a temporary filling (MD-Temp™, META Biomed co, Korea) for two weeks. The patient was consulted after 5 days for follow-up. He was already showing good progress and less inflammation and swelling were observed (Figure 4). He reported a purulent discharge from the sinus tract. One week later, sinus tract was healed completely (Figure 5). The tooth was asymptomatic. After applying a rubber dam and removal of the intracanal dressing, the root canal was irrigated again and dried using paper point. The gutta-percha master cones were fitted and checked radiographically (Figure 6). The root canal obturation was performed with Protaper gutta-percha F3, Fine accessory cones...
and sealer (MM-Seal™, Micro-Mega, Besançon, France) using the cold lateral condensation technique. A control radiograph was taken to assess the obturation (Figure 7). A temporary restoration (MD-Temp) was placed. The patient was recalled after 1 week for a permanent coronal restoration. He refused the use of amalgam and preferred an esthetic restoration. Therefore, a composite resin was used (Opallis, FGM, Brasil) (Figure 8). At the 6 month follow-up, the patient was comfortable without symptoms (Figure 9a). A follow up radiograph was taken and showing a considerable periapical healing with a decrease of the radiolucency (Figure 9b). Six months later, the patient returns for additional radiographic follow-up.

**DISCUSSION**

The cutaneous sinus tract of dental origin is an uncommon but well documented condition. However, these lesions continue to be a diagnostic dilemma. Patients usually initially consult a general practitioner or a dermatologist due to the lack of dental symptoms and the unknown possible correlation (Yuksel et al., 2010). Roughly 50% of the patients affected have to deal with unnecessary surgical excisions, radiotherapy, antibiotic therapy and multiple biopsies before the correct diagnosis established (Varol and Gülşes, 2009).
The odontogenic cutaneous sinus tract on the facial and cervical skin often develops as a result of chronic apical periodontitis caused by infected pulp necrosis (Mardones et al., 2010). The apical infection may be spread through the marrow space, and then perforate the cortical bone. In soft tissue, the infection may be spread through the path of least resistance between facial spaces and finally perforate a mucosal or cutaneous surface (Satish et al., 2013; Nahmias et al., 2009). However, Chan et al. (1997) reported an extra-oral cutaneous sinus tract caused by vertical root fracture. Caliskan et al. (1995) also reported a case of cutaneous sinus tract originating from a fractured crown caused by trauma. The characteristic lesion is erythematous, smooth, symmetrical nodule, 1 to 20 mm in diameter. There is periodic drainage and crusting in some cases and the lesion is depressed below the normal skin surface. Palpation of the involved area often reveals a cord like tract attached to the underlying bone (maxilla or mandible) in the area of suspected tooth (Kayahan et al., 2003; Patni et al., 2010). Histologically, most of the sinus tracts were not epithelialized and only bordered by granulation tissue. It is commonly assumed that an epithelial lining may cause complications in healing. The longer the sinus tract exists, the more likely it is to have an epithelial lining (Sadeghi and Dibaei, 2011; Yuksel et al., 2010). Correct diagnosis of a cutaneous sinus tract of dental origin can be detected by correct oral investigation, visual inspection, tapping, pulp sensibility test and an intra-oral radiograph carried out with a gutta-perchacone placed in the sinus tract (Yuksel et al., 2010). In the case of this study, the causal tooth was evident, for that the radiograph was taken without gutta-percha in place. The differential diagnosis should include traumatic lesions, fungal and bacteriologic infections, neoplasms, presence of foreign body, local skin infection, pyogenic granuloma, chronic tuberculosis lesion, osteomyelitis, actinomycosis and gumma of tertiary syphilis. Rare entities to be included in the differential diagnosis are defects of thyroglossal duct origin or branchial cleft, salivary gland and duct fistula and suppurative lymphadenitis (Kansal et al., 2013; Patni et al., 2010). Pustule is the most common of all purulent draining lesions and is readily recognized by its superficial location and short course. Actinomycosis exhibits multiple draining lesions and characteristic fine yellow granules in the purulent discharge. The tooth is often not involved radiographically. If a sinus tract does not close after appropriate removal of the primary cause, the most common alternative cause is actinomycosis (Mittal and Gupta, 2004; Patni et al., 2010). Osteomyelitis of jaw is usually secondary to some type of exogenic trauma, acquired infection after extraction of diseased teeth, impacted teeth, or retained roots. It rarely gives rise to a cutaneous sinus and is mostly associated with a history of some debilitating systemic disease or fracture (Mittal and Gupta, 2004; Patni et al., 2010). Orocutaneous fistula occurs frequently after trauma to the head and neck region and leads to continual leakage of saliva or to lower face or neck. Malignancy usually presents as fixation to underlying skin with involvement of underlying osseous structures (Patni et al., 2010). A salivary gland fistula has a characteristic location and associated patient history. Moreover, the defect is not through and through as in orocutaneous fistula. Probing the duct and performing sialography aid diagnosis (Mittal and Gupta, 2004). Thyroglossal duct cyst and branchial sinus are developmental lesions and therefore are observed early in life. The former, however, is found high in midline and is stressed when the tongue protrudes, whereas the latter is found in the lateral neck region (Mittal and Gupta, 2004).

Non-surgical therapy is the treatment of choice if the tooth is restorable. Extraction is indicated for non-restorable teeth (Satish et al., 2013). Some difference exists in the literature regarding the removal of the sinus tract itself. Winstock (1959) recommended excision of the sinus tract and sinus in continuity at the time of treatment of the dental pathology with immediate plastic repair of the cutaneous site. However, most authors pointed that once the primary odontogenic cause is removed, the sinus tract and cutaneous lesion heal without further treatment. Healing occurs by secondary intention in most cases. Cosmetic surgical treatment may be required at a later date if the healing results in cutaneous retraction or dimpling (Patni et al., 2010). Nowadays, orthograde root canal treatment is favored. After elimination of the reason of the infection, the sinus tract regularly disappears within 5 to 14 days (Cantatore et al., 2002). Root canal irrigation is one of the most critical procedure and a very important factor adjudicating on the success of root canal treatment. Sodium hypochlorite was used most of the time to irrigate the root canals, because of its bactericidal effects and for dissolving residual necrotic tissue. EDTA
was used to eliminate the smear layer (Yuksel et al., 2010). Calcium hydroxide is an intra-canal medicament that is commonly used, because of its ability to predictably disinfect the root canal system. Its biological properties are achieved by the dissociation in Ca$^{2+}$ and OH$^{-}$ ions. The antimicrobial effects of calcium hydroxide relate directly to its high alkalinity (pH 12.5), it has a destructive effect on cell membranes and protein structures (Kansal et al., 2013). The use of calcium hydroxide appears to promote a favorable environment for osseous repair and the resolution of the sinus tract.

Clinical and radiographic follow-up should be regular to detect non healing cases or cutaneous retraction. In these cases, surgery should be considered.

Conclusion

A dental cause must be considered for any cutaneous sinus tract involving the face or neck. It may be concluded that the correct diagnosis is the key to treat cutaneous sinus tracts. Non-surgical treatment is the first
treatment choice that will result in predictable and rapid healing of these lesions. Surgery should only be considered in cases resisting conservative therapy.

Conflict of Interests

The author(s) have not declared any conflict of interests.

REFERENCES