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Case Report

Diagnosis and treatment of odontogenic cutaneous sinus tracts of endodontic origin: A case report

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Abstract

Aim: To describe a case of extra-oral sinus tract, related to infected tooth, which was initially misdiagnosed as skin lesion and inappropriately treated.
Summary: The extra-oral sinus tract was initially misdiagnosed as skin lesion. Dermatological treatment was performed and antibiotics prescribed but the lesion did not resolve. Then, a dental cause was identified. Endodontic intervention resulted in resolution of the problem, confirming the initial misdiagnosis.

Keywords: *endodontic therapy, odontogenic fistula, sinus tract.*

1. Introduction

Extra-oral fistula of odontogenic origin can be misdiagnosed with local skin infections, furuncles, ingrown hair or occluded sweat gland duct, osteomyelitis, neoplasms, tuberculosis, actinomycosis, and congenital midline sinus of the upper lip, carcinomas (Yasui et al. 2005, Fatouris 2000) .Possible dental causes include trauma, retained roots, residual chronic infection of the jaws, and pulp disease (Ozdemir et al.2008). If the etiology is pulpal, it usually responds to endodontic therapy. A delay in correctly diagnosing these types of lesions can result in inappropriate treatment. It has been estimated that half of the patients with extra-oral fistula are submitted to multiple dermatological surgeries and long-term antibiotic therapy before the correct diagnosis is established (Cantore et al. 2002)
A sinus tract of endodontic origin is caused by pulp necrosis of the affected tooth. The microbiologically induced inflammation may penetrate the alveolar bone and spread along the path of least resistance. Eventually, the inflammatory processes can reach the surrounding soft tissue and form a path for drainage (Gu¨lec et al. 2001). The opening of the sinus tract can be located either intra-orally or extra-orally. Intra-orally, the opening is usually visible on the attached buccal gingiva or in the vestibule. The site of extra-oral drainage depends on which tooth is diseased, and on specific factors such as the virulence of the microorganism and the relation between anatomy and facial muscle attachments to determine the trajectory of the fistula (Al-Kandari et al. 1993). However, it is most commonly found on the cheek, chin, and angle of the mandible, and occasionally on the floor of the nose (Lubti et al. 1976, Lubti et al. 1983).
Some studies have reported unsuccessful cutaneous therapies due to difficulties in diagnosing extra-oral fistula of odontogenic origin (Cohenca et al. 2003, Mittal & Gupta 2004). It is important that interaction occurs between physicians and dentists to avoid submitting patients to unnecessary surgery before definitive endodontic treatment (Foster et al. 1992).
The following clinical case present a patient with cutaneous sinus tracts that was misdiagnosed initially as facial skin lesion and was submitted to inappropriate dermatological treatment and antimicrobial therapy. Once the correct diagnosis revealed the dental origin, non-surgical root canal treatment of tooth was performed.

2. Report

A healthy 19-year-old man with the chief complain of draining pustule at the right mandibular region that appeared 4 months, previously was referred to the department of endodontics in the dental faculty of Shahid Beheshti University, Iran, to verify a possible dental cause for that. During history taking, the patient disclosed that he had been submitted to dermatological treatment for the cutaneous lesion. The patient also reported that as the cutaneous lesion was not healed. He was also treated with 600 mg/d clindamycin. The patient was subsequently referred to the endodontic department. Clinical examination revealed extra-orally cutaneous draining fistula at the right inferior border of mandible (Fig1) and intra-orally a composite resin in tooth 30.Vitality tests were negative. Periodontal probing revealed a normal intact gingiva.



Fig. 1: Clinical presentation of cutaneous fistula

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Radiographic examination revealed a large furcal radiolucency, which probably caused the facial sinus tract (Fig2).Diagnosis was chronic apical abscess or suppurative periodontitis with fistula.

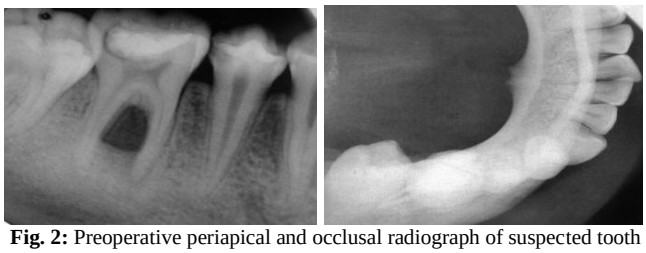


Fig. 2: Preoperative periapical and occlusal radiograph of suspected tooth

A non-surgical endodontic therapy was planned and performed in two sessions. After block anesthesia with: 1.8 ml of Lidocaine 2% containing epinephrine 1:80 000 (Persocaine, DarouPakhsh, Iran) and rubber dam placement, root canal treatment was initiated with pulp chamber access and biomechanical preparation of the root canals. There was drainage from the tooth. Working length was determined by an electronic apex locator (Rayapex, VDW, and Germany) (Fig3).Canal preparation was conducted using crown down technique. Irrigation during instrumentation was carried out with 2.5% sodium hypochlorite(Golrang , Iran) and final irrigation with EDTA(Calasept,NordiskaDental,Sweden), which remained for 2 min in the canal. After sufficient drainage, calcium hydroxide paste was used as the intra-canal medicament. After 2 weeks, drainage had ceased (Fig4) and the canal filling was performed by the lateral condensation technique using gutta-percha (AriaDent, Iran) and AH26 sealer (DentsplyDeTrey, Germany) (Fig5).

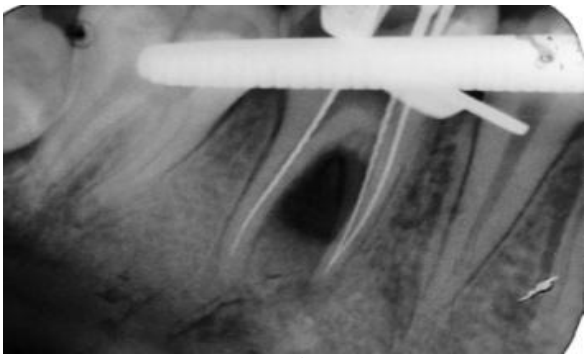


Fig. 3: Periapical radiography of working length determination



Fig. 4: Clinical presentation after 2 weeks Ca (OH) $_2$therapy

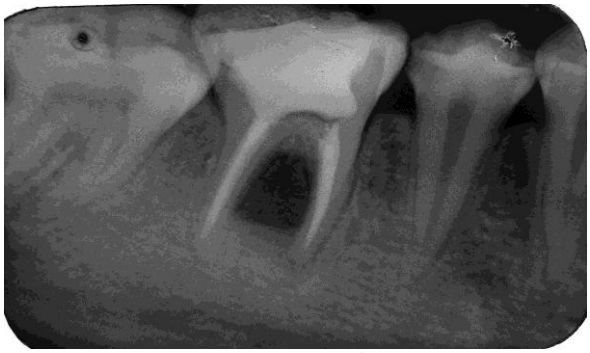


Fig. 5: Periapical radiograph of obturated tooth

At the 1 year recall, healing of the extra-oral fistula with scar had occurred and radiographic examination showed the repair of periapical tissue (Fig6).

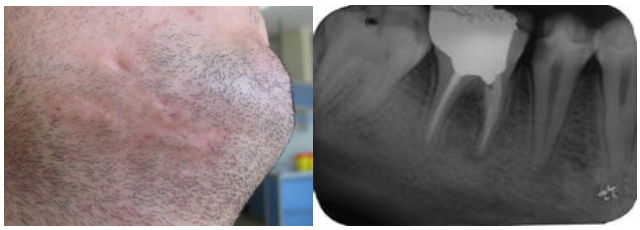


Fig. 6: Clinical and radiograghic presentation after 1 year recall

3. Discussion

The case of cutaneous lesions described in this study had been previously misdiagnosed and treated with antibiotic therapy. Although many non odontogenic disorders may also produce an extra-oral fistula (Cohenca et al. 2003), the opinion of a dentist in cases of a cutaneous sinus tract is of great importance in providing appropriate differential diagnosis and clinical care.

Chronic extra-oral cutaneous sinus tracts represent a diagnostic challenge to the clinician, as they may be of either odontogenic or non-odontogenic origin. In the case presented here, differential diagnosis included: (a) radicular cyst; (b) chronic periapical abscess associated with the root of the mandibular right first molar; (c) traumatic bone cyst; (d)buccal bifurcation cyst .According to clinical and radiographic examinations and medical history, Diagnosis was chronic apical abscess or suppurative periodontitis with fistula.

The suppurating sinus tracts of endodontic origin are most commonly found in the intraoral region. When they are located extra-orally, 80% are caused by mandibular teeth with purulent drainage on the chin or sub-mental area (Foster et al. 1992). In this study, due to the relationship between muscular facial insertions, the sinus tract was localized, on the patients' inferior border of mandible next to the apex with chronic apical abscess. However, such cutaneous lesions are not always next to the origin of the infection and few a patients report toothache or other symptoms, making the correct diagnosis difficult. Sheehan et al. (2005) observed an extra-oral fistula in the nasofacial sulcus, which was first diagnosed as a facial furunculous (Sheehan et al. 2005). As the lesion did not respond to treatment with antibiotics for years, careful intraoral examination and panoramic radiograph were recommended in order to make the diagnosis and confirm the dental origin of the cutaneous sinus tract. Thus, the clinician should direct special attention to oral clinical conditions such as caries, deficient restorations and also periodontal conditions (Cantore et al. 2002). As a tooth with a necrotic pulp can have a normal appearance or present only slight alterations in its color, radiographic analysis can be used to show bone loss in the apex of the infected tooth, contributing to the diagnosis (Soares et al. 2007). In the clinical case described here, the radiographs clearly revealed furcal radiolucency associated with a suspected tooth that did not respond to pulp sensibility tests. The closure of the extra-oral sinus tract after non-surgical root canal treatment confirmed the initial misdiagnosis and the dental origin of the skin lesions. With sinus tracts of dental origin, spontaneous closure of the fistula should be expected within 5 to 14 days after root canal treatment or tooth extraction (Al-Kandari et al.1993). In fact, the sinus tracts in this case healed following the initial treatment session.

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 (Fava & Saunders 1999). The antimicrobial effects of calcium hydroxide relate directly to its high pH 12.5, it has a destructive effect on cell membranes and protein structures (Pacios et al. 2003). Because it plays a major role as inter-appointments dressing in the disinfection of the root canal system,

a $Ca(OH)_2$ based pastes was used as an antibacterial dressing in this case.

The drainage is important for the conservative management of large periapical lesions. Fernandes and Ataide has demonstrated that large periapical lesion healed using an aspiration technique for the drainage (Fernandes & De Ataide 2010). When drainage is obtained, the symptoms are reduced without systemic antibiotics (Caliskan 2004). In the present cases, root canal treatments were carried out in two visits without antibiotics.

Radiographic signs such as density change within the lesion, trabecular reformation and lamina dura formation confirmed healing, particularly when associated with the clinical finding that the tooth was asymptomatic and the soft tissue was healthy (Saatchi 2007). Some authors declared that a period of more than 2 years is able to determine the final treatment result of these lesions (Broon et al. 2007). In the present cases, recession of the lesions by a non- surgical approach was evident after 1 year.

4. Conclusion

A dental cause must be considered for any cutaneous sinus tract involving the face or neck. Clinical and radiographic dental examinations can contribute to the localization of the teeth involved and avoid unnecessary antibiotic or surgical therapies. In the case reported here the elimination of infection through nonsurgical root canal treatment led to the resolution of the sinus tracts and promoted periapical healing of the tooth involved.

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