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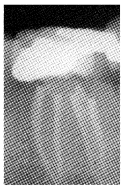

CASE REPORT

Diagnosis and treatment of odontogenic cutaneous sinus tracts of endodontic origin: three case studies

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Abstract

Pasternak-Júnior B, Teixeira CS, Silva-Sousa YTC, Sousa-Neto MD. Diagnosis and treatment of odontogenic cutaneous sinus tracts of endodontic origin: three case studies. *International Endodontic Journal*, **42**, 271–276, 2009.

Aim To describe three cases of extraoral sinus tracts, related to infected teeth, which were initially misdiagnosed as skin lesions and inappropriately treated.

Summary The extraoral sinus tracts were initially misdiagnosed as skin lesions. Dermatological surgery was performed and antibiotics prescribed but the lesions did not resolve. Then, a dental cause was sought, and identified. Endodontic intervention resulted in resolution of the problem, confirming the initial misdiagnosis.

Key learning points

- Dermatologists and other medical practitioners should be aware that dental extraoral sinus tracts can be confused with skin lesions.
- A dental aetiology, as part of a differential diagnosis, should be kept in mind with orofacial skin lesions.
- If an extraoral sinus tract is of endodontic origin, then elimination of infection through effective endodontic treatment will lead to resolution of the sinus tract.
- Early correct diagnosis can prevent unnecessary and ineffective antibiotic therapy and/or surgical intervention.

Keywords: endodontic therapy, odontogenic fistula, sinus tract.

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Introduction

Extraoral fistula of odontogenic origin can be misdiagnosed and confused with traumatic injuries, furuncles, bacterial infections, carcinomas, osteomyelitis, pyogenic granulomas, foreign objects and congenital fistula. Due to this array of diagnostic possibilities,

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unsuccessful therapies are used commonly before the correct differential diagnosis is defined (Held *et al.* 1989, Cohen & Eliezri 1990, Foster *et al.* 1992, Fatouris 2000, Yasui *et al.* 2005). A delay in correctly diagnosing these types of lesions can result in ineffective and inappropriate treatment (Johnson *et al.* 1999). It has been estimated that half of the patients with extraoral fistula are submitted to multiple dermatological surgical operations 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 followed by invasion of microorganisms causing an inflammatory lesion in the periapical area of the affected tooth. The microbiologically induced inflammation may penetrate the alveolar bone and spread along the path of least resistence. Eventually, the inflammatory process can reach the surrounding soft tissue and form a path for drainage (Kaban 1980, Cioffi *et al.* 1986, Held *et al.* 1989, Güleç *et al.* 2001). The site of extraoral 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 (Kaban 1980, Al-Kandari *et al.* 1993, Tidwell *et al.* 1997).

Several studies have reported unsuccessful cutaneous therapies due to difficulties in diagnosing extraoral fistula of odontogenic origin (Nakamura *et al.* 1999, Cohenca *et al.* 2003, Mittal & Gupta 2004). It is important that interaction occurs between physicians and dentists to avoid submitting patients to multiple biopsies and unnecessary surgery before definitive endodontic treatment (Foster *et al.* 1992).

The following clinical cases present three patients with cutaneous sinus tracts that were misdiagnosed initially as facial skin lesions and were submitted to inappropriate dermatological surgery and antimicrobial therapy. Once the correct diagnosis revealed the dental origin, nonsurgical root canal treatment of each tooth was performed.

Reports

Case 1

A healthy 37-year-old woman was referred to the dental clinic to verify a possible dental cause for a skin lesion. During history taking, the patient disclosed that she had been submitted to dermatological surgery for removal of a cutaneous lesion (Fig. 1(a,b)) in an ambulatory medical centre. The patient also reported that as the cutaneous lesion did not heal after the first procedure, the doctor suggested further surgery with a superior safety margin. The patient sought a second medical opinion and was subsequently referred to a dental clinic. Clinical examination revealed an extensive composite resin in tooth 32. Radiographic examination revealed a periapical radiolucency compatible with apical periodontitis (Fig. 1c). After local anaesthesia and rubber dam placement, root canal treatment was initiated with pulp chamber access and biomechanical preparation of the

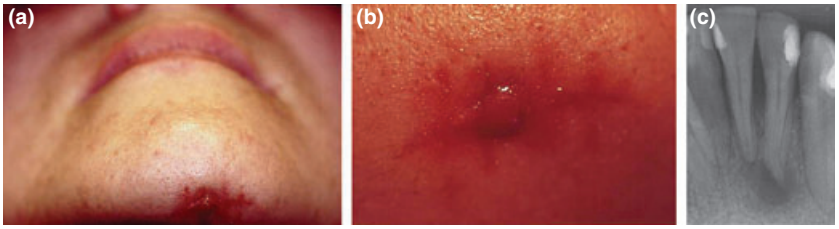

Figure 1 Pre-operative extraoral view of the sinus tract (a); close up of fistula (b); periapical radiograph of the suspected tooth (c).

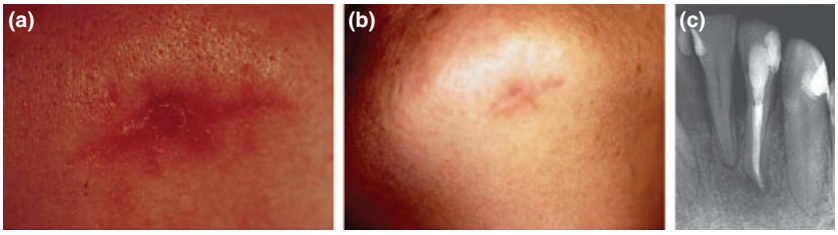

Figure 2 One week after the endodontic treatment with calcium hydroxide paste (a), and clinical (b) and radiographic (c) follow up after 1 year.

root canals. Irrigation during instrumentation was carried out with 1% sodium hypochlorite (Dermus, Florianópolis, SC, Brazil) and final irrigation with EDTA (Dermus, Florianópolis, SC, Brazil), which remained for 3 min in the canal (Teixeira *et al.* 2005). Calcium hydroxide paste was used as the intracanal medicament (Calem, SS White, Rio de Janeiro, RJ, Brazil). After 1 week, drainage had ceased (Fig. 2a). The canal filling was performed 2 weeks after the initial appointment.

At the 1 year recall, healing of the extraoral fistula had occurred (Fig. 2b). Radiographic examination showed the repair of periapical tissue (Fig. 2c).

Case 2

A healthy 18-year-old man was referred to the dental clinic to verify a possible dental cause for a skin lesion. During history taking, the patient reported that he had been submitted to three surgical interventions for removal of a facial cutaneous lesion. However, as the facial lesion did not show any healing after the third surgery, a lesion of odontogenic origin was considered. The clinical (Fig. 3(a,b)) and radiographic (Fig. 3c) examination revealed pulp necrosis in tooth 46 and a periapical radiolucency compatible with apical periodontitis, which probably caused the facial sinus tract.

The root canal treatment was performed in two sessions and the clinical management was conducted as in case 1. Fifteen days after observing that the drainage had stopped, the root canal treatment was completed (Fig. 4a). A 1 year follow-up showed that the periapical tissues had resolved (Fig. 4b). The extraoral fistula disappeared but the face was still scarred from the dermatological surgery (Fig. 4c).

Case 3

A healthy 29-year-old man was referred to the dental clinic to verify a possible dental cause for a skin lesion. During history taking, the patient reported that he had been submitted to facial surgery three times for a cutaneous lesion in an ambulatory medical

Figure 3 Pre-operative view of the cutaneous sinus tract (a); close up of fistula (b); periapical radiograph of the suspected tooth (c).

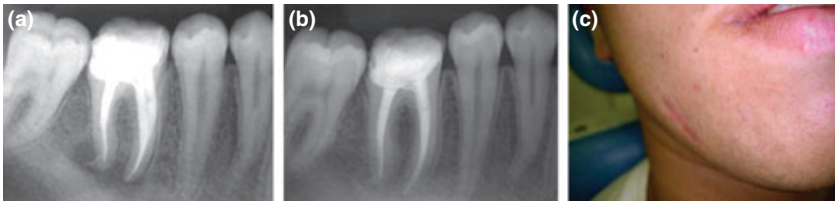

Figure 4 Final radiograph of the endodontic treatment (a), and radiographic (b) and clinical (c) follow-up after 1 year.

centre. As no success was achieved, he was referred to a dermatological specialist who suggested the possibility of a dental origin for the skin lesion.

Clinical (Fig. 5(a,b)) and radiographic (Fig. 5c) examination revealed that the source of the lesion was probably related to tooth 35. An apical radiolucency was evident suggesting apical periodontitis and pulp necrosis, which was confirmed by the negative response to cold stimuli. Root canal treatment was performed as described in cases 1 and 2 (Fig. 6a). A 1 year follow-up confirmed that the periapical tissue had healed (Fig. 6b). The sinus tract had disappeared but the face was still scarred from the dermatological surgery (Fig. 6c).

Discussion

The three clinical cases of cutaneous lesions described in this study had been previously misdiagnosed and treated with surgery and antibiotic therapy. Although many nonodontogenic disorders may also produce an extraoral fistula, the opinion of a dentist in cases of a cutaneous sinus tract is of great importance in providing appropriate differential diagnosis and clinical care (Kaban 1980, Cioffi *et al.* 1986, Yasui *et al.* 2005, Soares *et al.* 2007).

Gupta & Hasselgren (2003), on analysing 330 patients who had been referred to a dentist for endodontic therapy (393 teeth), verified that one in five teeth with dental periradicular inflammation had a sinus tract. These suppurating sinus tracts of endodontic

Figure 5 Pre-operative view of the cutaneous sinus tract (a); close up of fistula (b); periapical radiograph of the suspected tooth (c).

Figure 6 Final radiograph of the endodontic treatment (a) and clinical (b) and radiographic (c) follow-up after 1 year.

origin are most commonly found in the intraoral region. When they are located extraorally, 80% are caused by mandibular teeth with purulent drainage on the chin or submental area (Foster *et al.* 1992). In this study, due to the relationship between muscular facial insertions, the sinus tract was localized, in the first case, on the chin base, and in the other cases on the patients' cheeks, all next to the teeth with chronic apical periodontitis.

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 extraoral fistula in the nasofacial sulcus, which was first diagnosed as a facial furunculous. 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, Witherow *et al.* 2003). As a tooth with a necrotic pulp can have a normal appearance or present only slight alterations in its colour, radiographic analysis can be used to show bone loss in the apex of the infected tooth, contributing to the diagnosis (Witherow *et al.* 2003, Soares *et al.* 2007). However, when panoramic and periapical radiography are unable to locate the tooth involved, the tracking of the fistula can help the final diagnosis. In these cases, the dental aetiology can be confirmed by tracing the sinus tract to its origin with gutta-percha or a similar radiopaque material during radiographic examination, and using a pulp sensibility test (Grossman 1981, Al-Kandari *et al.* 1993, Johnson *et al.* 1999, Cantore *et al.* 2002). 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. The closure of the extraoral sinus tract after nonsurgical 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, Johnson *et al.* 1999). In fact, the sinus tracts in these cases healed following the initial treatment session.

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 cases 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 teeth involved.

Disclaimer

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