
Case Report

Odontogenic Cutaneous (Orofacial) Sinus Tract: A Case Report

Yi-Ching Huang¹, Wen-Hui Chen¹, Cheuk-Kwan Sun^{2,3}

Odontogenic cutaneous sinus tracts of head and neck area, which usually originate from dental apical abscesses, are usually mistaken for skin lesions because of lack of dental symptoms. Dermatological and surgical treatments from misdiagnosis may lead to ineffective multiple surgeries and prolonged medication. Definite dental intervention, including endodontic treatment or tooth extraction, is needed for complete eradication of the sinus tract. We herein present a 57-year-old woman with a persistent skin lesion for over two years despite medication and surgical treatment three months earlier. The lesion was incidentally detected on dental examination. She was successfully treated with endodontic intervention without notable sequelae. The present case report aimed at discussing the causes, diagnosis, prevalence, and treatment of the condition to remind clinicians of including the disease in their list of differential diagnoses on encountering a skin lesion over the head and neck area.

Key words: sinus tract, cutaneous, orofacial, root canal treatment, skin lesion

Introduction

Odontogenic skin lesions, which are usually mistaken for diseases of dermatological origin, are rare.¹ Instead of presenting as oral mucosal lesions, odontogenic cutaneous sinus tracts from dental apical abscesses usually manifest as skin lesions in the head and neck areas². Because of erythematous change of skin and pustule formation in the absence of history suggestive of dental diseases (e.g., toothache), patients with such lesions usually

seek advice from dermatologists or general surgeons and the prescription of long-term antibiotics that not only result in the persistence of the sinus tract but may also lead to misdiagnosis of cancer because of repeated recurrences.³ Herein we present a case of odontogenic sinus tract with infection and cutaneous manifestations in an attempt to highlight the importance of including this condition in the list of differential diagnoses when a dermatological lesion is encountered.

From the ¹Department of Dentistry, E-Da Hospital, ²Department of Emergency Medicine, E-Da Hospital, ³School of Medicine for International Students, I-Shou University, Kaohsiung, Taiwan.

Received: September 2, 2018

Accepted: January 3, 2019

Address reprint request and correspondence to: Cheuk-Kwan Sun, Department of Emergency Medicine, E-Da Hospital, No.1, Yida Road, Jiaosu Village, Yanchao District, Kaohsiung City 82445, Taiwan.

Tel: +886-7-6150011 ext. 25196, E-mail: lawrence.c.k.sun@gmail.com

Case Report

A 57-year-old woman received dental treatment for other dental conditions at a local dental clinic in which the dentist incidentally discovered a skin lesion over right side of her chin for which she was referred to our Department of Dentistry for further evaluation. The lesion was first noted 2 – 3 years ago. Despite her previous medication and surgical excision at a local hospital three months earlier, the lesion recurred and persisted. The patient had hypertension and diabetes mellitus under medication control without history of smoking, drinking or betel nut chewing.

Clinical examination demonstrated a nodule about 4 – 5 mm in diameter with a skin depression over the right side of her chin from which pus was found on compression. Pain on palpation and a cord-like sensation between the skin lesion and the lower jaw were also noted (Fig. 1A). Intraoral examination showed bad oral hygiene as well as multiple ill-fitting crown and bridges. Although panorex radiograph showed no notable lesion, peri-apical radiograph revealed radiolucent lesions over the apexes of right lower lateral incisor and canine. Gutta percha, a radio-opaque material used for root canal filling in dentistry, was infused through the skin opening to trace the sinus tract which was found to lead to a radiolucent lesion over the apex of right lower canine (Fig. 1B & 1C).

The diagnosis was orofacial sinus tract formation due to pulp necrosis with chronic apical abscess over the lower right canine. Treatment included removal of ill-fitting denture and root canal treatment of lower right canine. After a series of root canal debridement, including mechanical debridement with files, chemical disinfection with sodium hypochlorite and intra-canal medication with calcium hydroxide, the patient's clinical symptoms subsided. The root canal treatment was completed by filling the root canal (Fig. 1D). Although the

scar over the skin was still visible three months after treatment, the patient was symptom-free without pus discharge from the sinus. Four-year follow-up showed a barely discernible skin depression without notable pigmentation (Fig. 2)

Discussion

Although odontogenic cutaneous sinus tract is believed to be a rare presentation of dental root lesions,¹ the prevalence has been reported to be as high as 8.1% among patients

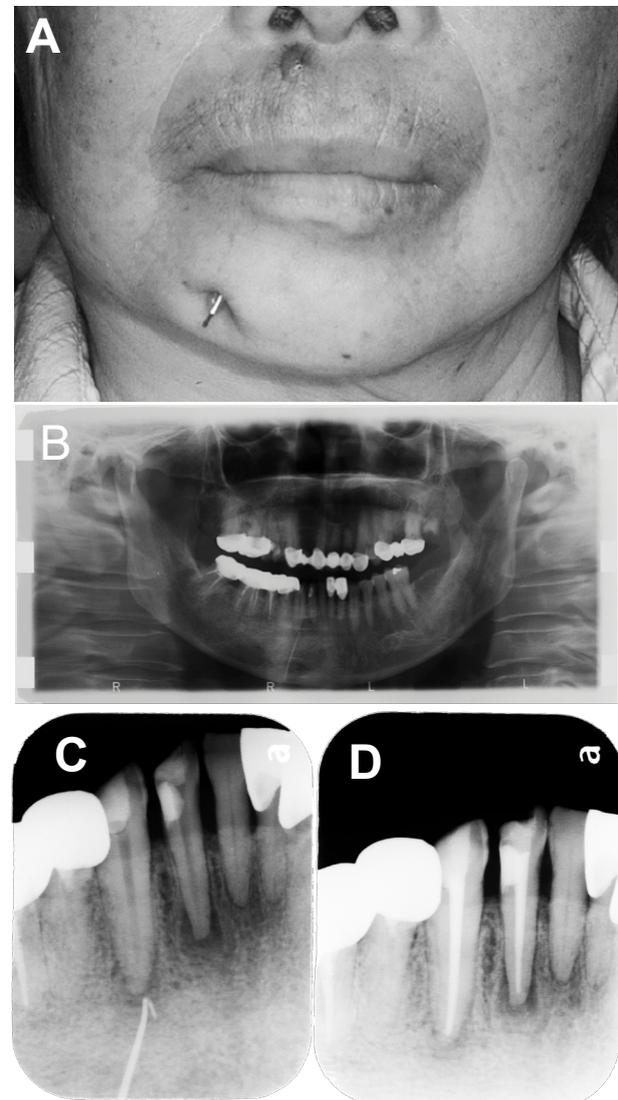


Fig 1. (A) Skin lesion traced by gutta percha; (B & C) Panorex and periapical films showing the lesion originating from tooth 43 (lower right canine); (D) Tooth 43 after root canal treatment.



Fig 2. Skin dimpling from previous surgery without pigmentation four years after dental root treatment.

with sinus tracts receiving endodontic treatments in a medical care setting.⁴ There is a wide discrepancy in the prevalent age of occurrence according to the literature. Although the condition was described to be more common in children than in adults in one study,⁵ another report found that the average age of patients with odontogenic sinus tracts was 37.1 ± 16.6 .⁶ Besides, the location of infection source has been reported to be four times more common in the lower jaw than that in the upper jaw, and mostly in the lower anterior teeth.⁷

Pathologically, dental root apical lesions usually originate from caries- or trauma-induced pulp necrosis and bacterial infection that spreads to root apex and periapical tissue, leading to periapical bone destruction.² Persistent destruction of periapical tissue induces the formation of abscess that spreads to area with least resistance following an anatomical pattern in accordance with the locations of the apical roots (Fig. 3), resulting in the formation of a sinus tract that may be pain-relieving because of a release of periapical pressure.^{2,8} Since oral muscles serve as natural barriers to the spread of infection, the location of the infection source guides the direction of the sinus tract. Infected root located above the insertions of the buccinator muscles in the maxilla or below those of the mentalis, mylohyoid, or buccinator muscles in the mandible would result in the development of extra-oral sinus tract.⁸

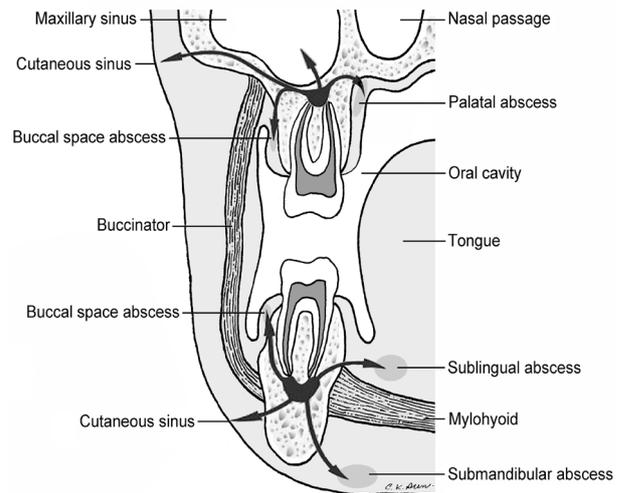


Fig 3. Sinus and abscess formation according to anatomical pattern in accordance with the locations of the apical roots

In our case, the formation of a facial sinus tract may be attributed to the location of the infected root apex below the insertion of the right mentalis muscle, although no tangible evidence was available as cone-beam computed tomography (CT) scan was not performed. The virulence of bacteria and the patients' immune system have also been reported to contribute to the formation of extraoral sinus tracts.⁹

In terms of clinical manifestations, an extraoral fistula usually presents as an erythematous, smooth, non-tender nodule with or without pus discharge.¹⁰ It may also manifest as a skin dimpling or retraction palpable as a cord-like tract that may attach to maxilla or mandible depending on its dental origin.¹⁰ If the origin of the lesion is one of the lower anterior teeth, the skin lesion usually occurs over the chin or submental area, while sinus tracts originating from the lower premolars typically cause skin lesions over the submandibular region. On the other hand, infection sources of the lower molars may lead to skin lesions in the submandibular, chin, or preauricular areas. If the lesion originates from one of the maxillary anterior teeth, the skin lesion usually occurs below the nose. Moreover, infection foci in maxillary canines would lead to lesions below the canthus of the eye, whereas those of maxillary

premolars and molars may cause lesions on the cheek.¹¹ Since patients with cutaneous fistulas usually do not have clinical dental symptoms² and the skin lesion is usually located some distance away from the infected tooth, they frequently seek medical advice from surgeons or dermatologists. The dental origin of our patient was found to be the lower right canine through tracing the fistula tract from a skin lesion over the right side of her chin (Fig. 2).

Microbiological analysis of the bacterial flora of an extraoral sinus tract usually shows polymicrobial infestation, including strict anaerobes such as anaerobic cocci, *Prevotella*, and *Fusobacterium* species as well as facultative anaerobes, the viridans group, streptococci, and *Streptococcus anginosus*.⁹ A weak immune system of the host may also increase incidence of the disease.

When a dental origin is suspected for a skin lesion, dental radiographic and oral examinations are indicated for diagnosis. Apical radiolucency and large restoration on dental radiograph or tooth discoloration on oral examination are suggestive of the diagnosis which may be confirmed by tracing the skin lesion with gutta percha (Fig. 1A) or a lacrimal duct probe.^{10,12}

Proper dental management, including root canal treatment or tooth extraction, is necessary for complete eradication of the sinus tract which usually leaves no notable skin lesion after healing.¹³ For patients having previously received surgical treatment (e.g., debridement) of the skin lesion, the resulting scarring and pigmentation may need to be treated with topical medication or laser resurfacing.

Conclusion

Because of its lack of dental symptoms, an odontogenic cutaneous sinus tract is usually mistaken for a skin lesion that prompts the patient to seek dermatological or surgical

treatment. Misdiagnosis of the condition may result in unnecessary surgeries and ineffective long-term medication. Timely recognition of the odontogenic origin is essential for early definite dental treatment.

References

1. Sakamoto E, Stratigos GT: Bilateral cutaneous sinus tracts of dental etiology: report of case. *J Oral Surg* 1973;31:701-4.
2. Cioffi GA, Terezhalmay GT Parlette HL: Cutaneous draining sinus tract: an odontogenic etiology. *J Am Acad Dermatol* 1986;14:94-100.
3. Jacobs J, Shocket E: Dermal fistula of dental origin masquerading as a skin cancer; report of a case. *Oral Surg Oral Med Oral Pathol* 1965;19:184-7.
4. Huang TJ, Roan RT, Lin HT: The management of sinus tracts of dental origin. *Kaohsiung J Med Sci* 1992;8:89-95.
5. Karp MP, Bernat JE, Cooney DR, et al: Dental disease masquerading as suppurative lesions of the neck. *J Pediatr Surg* 1982;17:532-6.
6. Spear KL, Sheridan PJ Perry HO: Sinus tracts to the chin and jaw of dental origin. *J Am Acad Dermatol* 1983;8:486-92.
7. Hodges TP, Cohen DA, Deck D: Odontogenic sinus tracts. *Am Fam Physician* 1989;40:113-6.
8. Sammut S, Malden N, Lopes V: Facial cutaneous sinuses of dental origin – a diagnostic challenge. *Br Dental J* 2013;215:555-8.
9. Swaies KL, Rudralingam M, Gandhi S: Extraoral cutaneous sinus tracts of dental origin in the paediatric patient. A report of three cases and a review of the literature. *Int J Paediatr Dent* 2016;26:391-400.
10. Mittal N, Gupta P: Management of extra oral sinus cases: a clinical dilemma. *J Endod* 2004;30:541-7.
11. Lewin-Epstein J, Taicher S, Azaz B: Cutaneous sinus tracts of dental origin. *Arch Dermatol* 1978;114:1158-61.
12. Gupta M, Das D, Kapur R, et al: A clinical predicament-diagnosis and differential diagnosis of cutaneous facial sinus tracts of dental origin: a series of cases reports. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2011;112:e132-6.
13. Tidwell E, Jenkins JD, Ellis CD, et al: Cutaneous odontogenic sinus tract to the chin: a case report. *Int Endod J* 1997;30:352-5.