

# Cutaneous Draining Sinus Tract of Odontogenic Origin

Adel Bouguezzi\*, Hajer Hentati, Abdellatif Chokri, Jamil Selmi

Department of Medicine and Oral Surgery, University Dental Clinic, Monastir, Tunisia

\*Corresponding author: dr-adel@live.fr

Received April 14, 2014; Revised May 09, 2014; Accepted May 11, 2014

**Abstract** A 12-year-old girl presented with a chronically draining lesion on her left cheek. The lesion was refractory to treatment with oral antibiotics. Physical examination revealed a decayed left mandibular first molar, and a panoramic radiograph demonstrated periapical lesion associated with the incriminated teeth. A diagnosis of cutaneous fistula of odontogenic origin was made, and the patient was treated with elective tooth extraction. The cutaneous fistula subsequently resolved. Intraoral examinations and radiographs are critical for making the diagnosis of cutaneous draining sinus tract of odontogenic origin. Many patients undergo unnecessary surgical therapies before having the correct diagnosis made, but root canal therapy or surgical extraction is the treatment of choice. A dental origin must be considered for any chronically draining sinus of the face or neck.

**Keywords:** *Fistula, odontogenic, skin, antibiotics, healing*

**Cite This Article:** Adel Bouguezzi, Hajer Hentati, Abdellatif Chokri, and Jamil Selmi, "Cutaneous Draining Sinus Tract of Odontogenic Origin." *Global Journal of Surgery*, vol. 2, no. 2 (2014): 21-24. doi: 10.12691/js-2-2-1.

## 1. Introduction

Cutaneous sinus tracts on the face are caused by dental lesions more often than by any other pathologic condition. Therefore, the presence of a cutaneous sinus on the face must alert the physician or the surgeon to make a dental examination.

Patients assuming the cutaneous sinus to be unrelated to dental infection, often seek treatment from a dermatologist or from their family physician. A review of case reports shows that after misdiagnosis of this lesion topical and surgical therapy are frequently attempted on the cutaneous aspect of the lesion and no dental treatment is provided. Sometimes there is an initial cessation of drainage of pus from the sinus, along with apparent healing, but there is always a recurrence [1].

The clinical case reported in this paper emphasizes the need of a prompt recognition of the etiological factor for a correct treatment planning on facial cutaneous sinus tract.

## 2. Case Report

A 12 year-old-girl, with a chronically draining, dimpled, crusted small nodule on her left cheek (Figure 1) came to the department of medicine and oral surgery of the University Dental Clinic of Monastir. Gentle pressure on the surrounding tissue elicited thick purulent drainage from the central punctum. The nodule had been present for two months and was initially diagnosed as a furuncle. Patient's medical history has no significant findings.

Because the drainage was refractory to antibiotic treatment, an intraoral examination was performed, and a panoramic radiograph was obtained.



Figure 1. Cutaneous odontogenic sinus tract in the left cheek



Figure 2. Intraoral view of the carious mandibular left first molar

Clinical examination revealed a carious mandibular left first molar (Figure 2) that did not respond to sensitivity pulp testing, but the rest of molars responded within normal limits.

Radiographic examination revealed a periradicular radiolucency associated with the periapical area of the mandibular left first molar (Figure 3).



**Figure 3.** Periapical radiolucency associated with the mandibular left first molar

Extraction of the infected tooth was performed (Figure 4) followed by dental space maintenance (Figure 5). Three weeks after, the infection resolved, the cutaneous lesion healed and a small umbilication in the skin remained (Figure 6).



**Figure 4.** Extraction of the incriminated tooth



**Figure 5.** Dental space maintainer following extraction



**Figure 6.** Healing of the fistula three weeks later

### 3. Discussion

Cutaneous sinus tract and fistulization of the facial skin have a wide range of etiologies, the most common being odontogenic in origin. Such patients usually seek help from surgeons or dermatologists rather than dentists and often undergo multiple inappropriate treatments.

Distant location of the sinus tract regarding its site of origin and the scant of symptomatology may explain why this condition is frequently overlooked [2].

Although cutaneous sinus tracts of dental origin have been well documented in the medical and dental literature, these lesions continue to be a challenging diagnosis [3, 4]. The discharge of purulent exudates usually is associated with periapical radiolucent area and goes through tissues and structures along the path of least resistance [5].

This inflammatory process progresses to destroy the cancellous alveolar bone, perforate the thin cortical plate and forms a subperiosteal abscess causing an intraoral sinus tract that opens into the vestibule buccal to the affected tooth.

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 [6]. If the bone perforation on the mandible occurs above the muscular attachment, then an intraoral sinus will result. If the perforation occurs below the level of muscular attachment, then a cutaneous sinus will result [6].

The majority of sinuses that arise are intraoral. Approximately 80% of cutaneous sinuses that occur arise from mandibular teeth and thus appear on the chin or submental region [7,8].

Slutzky-Goldberg et al [10] evaluated 1,119 patients referred for endodontic consultation and reported a prevalence of 108 (10.4%) with intra-oral sinus tracts. They reported that approximately two thirds of sinus tracts originated within the maxilla compared to one third which originated in the mandible. Chronic periapical abscess was the most common cause of sinus tracts of odontogenic origin and was reported in 71% of the cases. They also

found that 82.4% of these sinus tracts emerged on the buccal aspect of the alveolus and that 12% of these emerged either on the palatal or lingual aspect of the alveolus.

Odontogenic sinus tracts appear as a papule or nodule with purulent discharge usually in the chin or jaw [10] often fixed to underlying structures, palpation of the surrounding tissue may produce pus, which supports the diagnosis [11]. The majority arise on the chin, mandible, or submandibular area.[12]. On the basis of clinical appearance, the differential diagnosis includes pyogenic granuloma, actinomycosis, thyroglossal duct cyst, branchial cleft cyst, furuncle, squamous cell carcinoma, and epidermal cyst [13].

Intraoral and dental examinations are critical for making the diagnosis. In particular, the examiner should look for dental caries or restorations and periodontal disease [11,14]. The examiner should keep in mind that the involved tooth can even appear asymptomatic [15].

A periapical radiograph of the involved area often reveals a carious tooth or retained roots along with the associated periapical lesion, which may be a granuloma, or a cyst. Early radiographs can prevent unnecessary surgeries when the teeth appear clinically asymptomatic [16]. A panoramic or periapical radiograph will show a radiolucency at the apex of the infected tooth. A gutta-percha cone can be used to trace the sinus tract to its origin, which is usually a nonvital tooth [11]. It has been suggested that some dental computerized tomography software may be superior to panoramic or intraoral radiographs [17].

Biopsy, if performed, will show nonspecific findings such as pseudoepitheliomatous hyperplasia and chronic inflammation [18].

Most infections are polymicrobial, and culture often yields growth of anaerobes or facultative anaerobes such as streptococcal species. Chronic specific infections like tuberculosis and actinomycosis can also be a cause of sinus tracts in the head and neck region [19].

Johnson et al reported [20] a possible correlation between the application of heat to the face to relieve pain and cutaneous sinus tracts of odontogenic origin. They surmised that the heat causes vasodilation and increased blood flow to the local area and that such may have contributed to the cutaneous exit of sinus tracts. This contention is supported by the findings of Javid and Barkhordar [21]. They reported that of 59 patients treated for cutaneous sinus tracts of odontogenic origin, 34 reported using home poultices or hot fomentation to reduce pain and swelling and to draw out the puss. Such therapy may encourage the extraoral release of infection [22].

It has been observed that systemic antibiotic therapy will result in a temporary reduction of the drainage and apparent healing. Root canal therapy or surgical extraction is the treatment of choice. Antibiotics may be used as an adjunct to treatment in the setting of diabetes, immunosuppression, or systemic signs of infection such as fever [22], in fact systemic antibiotic administration is not recommended in patients with a cutaneous odontogenic sinus tract who have a competent immune system [3,4]. If antibiotics are to be used, penicillin is the first choice, clindamycin or amoxicillin-clavulanate may be used if the infection is unresponsive [23].

Some authors [24] are still convinced that the presence of a fistula indicates a more serious lesion that requires special intervention, such as surgical incision and excision of the entire fistulous tract, in addition to extraction of the diseased tooth. The reason why some authors believe in the need for surgical removal of the fistulous tract lies in the mistaken conviction that it is lined by an epithelium [23].

Grossman [25] states, however, that such tracts are lined by granulation tissue: in his study, he was unable to identify any epithelium at all. Bender and Seltzer [26] have also made histologic studies of numerous fistulous tracts without finding an epithelial lining.

Given the current state of knowledge, there is no reason to recommend surgical removal of such tracts. There is no reason that even epithelium-lined fistulous tracts should not heal after appropriate endodontic therapy [24].

Therefore, if surgery was performed, the cutaneous lesion usually resolves in 1 to 2 weeks [10]. The patient may be left with a residual umbilication of the skin that can be surgically revised if it is cosmetically unappealing [27].

## 4. Conclusion

Dental origins should be considered for any chronically draining sinus of the face or neck. A high index of suspicion and radiologic evidence of a periapical infection are necessary to make the diagnosis and may spare the patient numerous unnecessary therapies. Treatment must be focused on the elimination of the source of the infection; once infection is eliminated there is prompt resolution of the sinus tract. If the source of the infection is a retained root or non-restorable tooth or if the involved tooth is periodontally hopeless, extraction of the tooth is the only possible treatment.

## References

- [1] Al-Kandari A.M, Al-Quoud O.A, Ben-Naji A, Gnanasekhar J.D. *Cutaneous sinus tracts of dental origin to the chin and cheek: Case reports.* Quintessence Int 1993, 24: 729-733.
- [2] Sheehan DJ, Potter BJ & Davis LS. *Cutaneous draining sinus tract of odontogenic origin: Unusual Presentation of a Challenging Diagnosis.* South Med J 2005, 98: 250-2.
- [3] Mittal N & Gupta P. *Management of Extra oral Sinus Cases: A clinical dilemma.* J Endod 2004, 30: 541-7.
- [4] 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.
- [5] Pasternak-Junior B, Teixeira CS, Silva-Sousa YTC & Sousa-Neto MD. *Diagnosis and treatment of odontogenic cutaneous sinus tracts of endodontic origin: three case studies.* Int endod J 2009; 42: 271-276.
- [6] Johnson BR, Remeikis NA & Van Cura JE.. *Diagnosis and treatment of cutaneous facial sinus tracts of dental origin.* J Am Dent Assoc 1999, 130: 832-6.
- [7] Foster KH, Primack PD, Kulild JC. *Odontogenic cutaneous sinus tract.* J Endodontics 1992; 18:304-306.
- [8] Yang ZP, Lai YL. *Healing of a sinus tract of periodontal origin.* J Endodontics 1992; 18:178-180.
- [9] Slutzky-Goldberg I, Tsesis I, Slutzky H, Helling I. *Odontogenic sinus tracts: a cohort study.* Quintessence Int. 2009; 40: 13-18.
- [10] Spear KL, Sheridan PJ & Perry HO. *Sinus tracts to the chin and jaw of dental origin.* J Am Acad Dermatol 1983, 8: 486-92.
- [11] Cantatore JL, Klein PA, Lieblch LM. *Cutaneous dental sinus tract, a common misdiagnosis: a case report and review of the literature.* Cutis 2002; 70: 264-267.

- [12] Cioffi GA, Terezhalmay GT, Parlett HL. *Cutaneous draining sinus tract: an odontogenic etiology*. J Am Acad Dermatol 1986; 14: 94-100.
- [13] Held JL, Yunakov MJ, Barber RJ, et al. *Cutaneous sinus of dental origin: a diagnosis requiring clinical and radiologic correlation*. Cutis 1989; 43: 22-24.
- [14] Chidylo SA. *Intraoral examination in pyogenic facial lesions*. Am Fam Physician 1992; 46: 461-464.
- [15] Ong ST, Ngeow WC. *Medial mental sinus in twins*. Dent Update 1999; 26: 163-165.
- [16] Witherow H, Washan P, Blenkinsopp P. *Midline odontogenic infections: a continuing diagnostic problem*. Br J Plast Surg 2003; 56: 173-175.
- [17] Bodner L, Bar-Ziv J. *Cutaneous sinus tract of dental origin: imaging with a dental CT software programme*. Br J Oral Maxillofacial Surg 1998; 36: 311-313.
- [18] Stoll HL, Solomon HA. *Cutaneous sinuses of dental origin*. JAMA 1963; 184: 120-138.
- [19] Chowdri N, Sheikh S & Gagloo M et al. *Clinicopathological profile and surgical results of nonhealing sinuses and fistulous tracts of the head and neck region*. J Oral Maxillofac Surg 2009; 67: 2332-6.
- [20] Johnson BR, Remeikis NA, Van Cura JE. *Diagnosis and treatment of cutaneous facial sinus tracts of dental origin*. J Am Dent Assoc. 1999;130:832-836.
- [21] Javid B, Barkhordar RA. *Chronic extra-oral fistulae of dental origin*. Compend Contin Educ Dent. 1989:108-114.
- [22] Brown RS, Johnson CD, Melissinos EG, Smith BR. *A large necrotic defect secondary to a cutaneous sinus tract of odontogenic origin: a case report*. Compend Contin Educ Dent. 1995;16:362, 264, 366-372.
- [23] Swift JQ, Gulden WS. *Antibiotic therapy: managing odontogenic infections*. Dent Clin N Am 2002; 46:623-633.
- [24] Castellucci A. *Nonsurgical therapy of mucosal and cutaneous fistulae*. Roots 1\_2009; 32-42.
- [25] Grossman, L.I., Oliet, S., Del Rio, C.E.: *Endodontic practice*. 11th ed. Lea & Febiger, Philadelphia, 1988; p. 179-227.
- [26] Bender, I.B., Seltzer, S.: *The oral fistula: its diagnosis and treatment*. Oral Surg.1961, 14:1367-1376.
- [27] Gulec AT, Seckin D, Bulut S, et al. *Cutaneous sinus tract of dental origin*. Int J Dermatol 2001;40: 650-652.