

ODONTOGENIC SINUS TRACTS ODONTOJEN FİSTÜLLER

Altuğ UYSAL

Bahar SEZER

M. Cemal AKAY

Selda ERTÜRK

Ege University, School of Dentistry Department of
Oral and Maxillofacial Surgery, İzmir,

Key words: odontogenic sinus tracts, cutaneous sinus tracts, odontogenic infections.

Anahtar sözcükler: odontojen fistüller, deri fistülleri, odontojen enfeksiyonlar.

SUMMARY

Odontogenic sinus tracts are the most common cause of a chronically draining, fixed, nodulocystic papule of the face and neck. These lesions however continue to be a diagnostic challenge. The attending clinician must look carefully for a potential odontogenic infection; chronicity, lasting for weeks, months, and even years and the recognition of the lesion as a sinus tract are keys to making the correct diagnosis. Diagnostic errors can result in multiple surgical excisions and biopsies, long-term antibiotic therapy, and even radiation therapy. In this article, three cases of odontogenic sinus tract, which were misdiagnosed and mistreated are presented and discussed.

ÖZET

Odontojen fistüller baş ve boyun bölgesinde kronik direne olan nodülokistik papül'ün en yaygın sebebidir. Böyle olmasına rağmen, bu lezyonların teşhisindeki problemler devam etmektedir. İlgili bir klinisyen haftalar, aylar hatta yıllardır süren kronik potansiyel bir odontojen enfeksiyonu araştırmalıdır. Bu lezyonun odontojen kökenli fistül yolu olarak tanımlanması doğru bir teşhisin oluşturulmasında anahtar rol oynar. Teşhisteki hatalar, gereksiz cerrahi tedaviler ve biyopsiler, uzun süreli antibiyotik tedavisi ve hatta radyasyon tedavisi ile sonuçlanır. Bu makalede, yanlış teşhis ile tedavi yapılan üç odontojen fistül vakası sunulmuş ve tartışılmıştır.

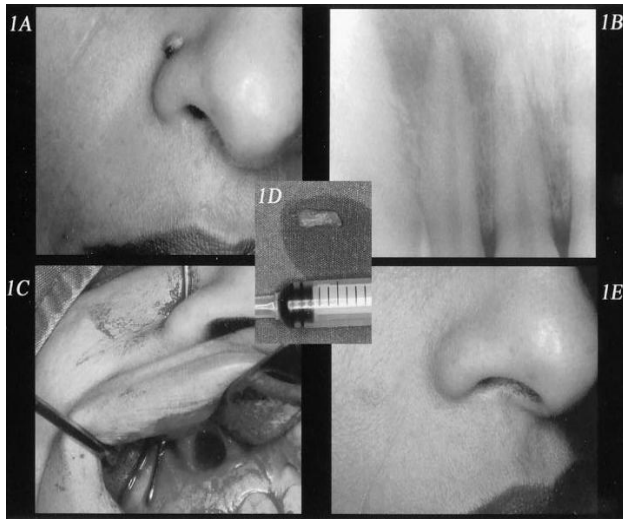
INTRODUCTION

Odontogenic cutaneous sinus tracts in the face and neck region are relatively uncommon and may present a diagnostic problem (1,2). As specific dental symptoms usually are absent in these cases, patients generally visit physicians first for the evaluation and treatment because of the absence of dental symptoms (1,2). These cutaneous sinus tracts are most commonly located on the chin, the cheek or in the submandibular area and rarely in the nasal region (2,3). However, all chronic draining sinus tracts of the face or neck should signal the need for thorough dental evaluation.

A review of the dental and medical literature reveals that patients have had inappropriate antibiotic therapy, radiotherapy, multiple biopsies and surgical excisions, all of which have failed with recurrence of cutaneous sinus tract, because the primary dental aetiology was never correctly diagnosed or addressed (4-7). We report three cases of extraoral sinus tracts, which were diagnosed as cutaneous sinus tracts of dental origin only after the failure of initial, misdirected therapy.

CASE 1

A 33-year-old healthy woman referred to Ege University Department of Oral and Maxillofacial Surgery with complaining of unerupted left mandibular third molars. Coincidentally, on extraoral examination, disclosed 0.5-cm nevus like lesion on her face adjacent to the right wing of the nose (Fig 1a).



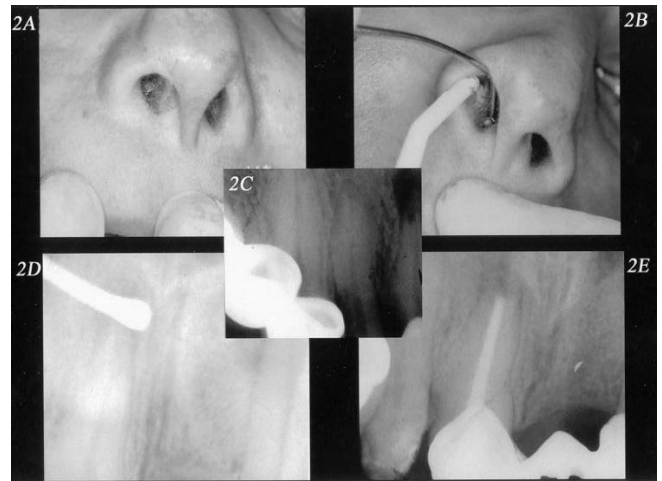
- Fig 1a.** Preoperative clinical appearance of draining lesion on adjacent to the ala of the nose.
Fig 1b. Diagnostic preoperative radiograph of maxillary right central incisor showing periapical radiolucency associated with a cutaneous odontogenic sinus tract.
Fig 1c. Surgical probe tracing the sinus tract.
Fig 1d. Macroscopic appearance of the sinus tract.
Fig 1e. Six-months after treatment, the cutaneous sinus was healed completely.

She stated that the lesion had been discharging pus intermittently for more than a year. Previous treatment of the patient was unsuccessful. The physician initially diagnosed the lesion as a dermatological problem and treated it with two courses of antibiotics and steroid creams. When it was unsuccessful, the patient's physician referred to a plastic surgeon for surgical procedures. Post medical history revealed that this patient had undergone a traffic accident with right upper jaw trauma 5 years ago. During intraoral examination the right upper lateral incisor was found to be darker than the other teeth. The adjacent central incisor presented evidence of chipped enamel at the angle of the crown and pulp is vital. Periapical radiograph of right upper lateral incisor revealed large periapical radiolucency associated with the right upper lateral incisor (Fig 1b). The clinical diagnosis established as chronic periapical abscess resulting from pulp necrosis. Root canal therapy with surgery was initiated. We used the probe to trace and confirmed that the tract led to the apex of the right lateral incisor (Fig 1c). The pulp chamber and as much of the root canal as possible were removed and the root canal was prepared

with files and reamers under irrigation with 3% sodium hypochloride solution and 3% hydrogen peroxide. Then the root canal was obstructed with gutta-percha root points and Canals N Sealer using the cold lateral condensation technique. Periapical lesion was curetted, the apicoectomy was performed and apical gutta-percha was cold burnished. This was followed by deep curettage of the involved area. Extraoral sinus tract was dissected (Fig 1d) and sutured with 3/0 catgut and 4/0 silk sutures. A week later the sutures were removed and the patient reported that she felt comfortable. There were no complications in the postoperative period. At the one-month recall visit, the sinus tract was closed and six months later, no evidence of the previous problem was observed (Fig 1e). This patient has been in our observation in the last five years and the lesion has not reoccurred.

CASE 2

A 43-year-old woman was referred to Ege University Department of Oral and Maxillofacial Surgery with a complaint of a persistently secreting lesion on the floor of her nose (Fig 2a).



- Fig 2a:** Extraoral sinus tract with purulent discharge on the floor of the nose.
Fig 2b: Nasal sinus tract of dental origin. Diagnostic surgical probe was inserted into the sinus path.
Fig 2c: Periapical radiograph showing radiolucency apices of teeth.
Fig 2d: Surgical probe inserted into sinus tract shown on the periapical radiograph reaching the distal root lesion.
Fig 2e: Six-months follow-up radiograph. Periapical osseous repair is evident.

After careful questioning, however, she said that the lesion was first noticed 24 months ago after her front teeth was prosthetically restored. The patient's medical history was non-contributory except for the occlusal trauma she had received. The lesion was excised twice in the last two years at ORL (Oto-Rhino-Laryngology) clinic but when the lesion was reoccurred, finally she was referred to our

clinic. In the extraoral examination, an active sinus tract was detected on the mucosa of the right nostril floor (Fig 2b). The patient had no complaints of dental pain or other dental symptoms. The right upper central incisor was asymptomatic, immobile and did not respond to electric pulp vitality test. Periapical radiogram revealed a large radiolucent area around the apices of maxillary anterior teeth (Fig 2c). A silver cone was inserted in the stoma of the sinus tract and then a periapical radiogram was taken. We observed that the sinus tract was reaching to the upper right central incisor (Fig 2d). Based on these findings, the patient was diagnosed as having an odontogenic sinus tract secondary to chronic periapical abscess of the right upper central incisor. The tooth was treated as an infected root canal treatment.

The root canal was prepared with files and reamers under irrigation with 3% sodium hypochlorite solution and 3% hydrogen peroxide. At first chloramphenicol and then Ca(OH) were used as intracanal medicaments. Then the root canal was obstructed with gutta-percha points and Canal N sealer using the cold lateral condensation technique. Then a full-thickness flap was carefully reflected under local anaesthesia. The incision lines of the flap did not overlie any bone defect, and the base of the flap was the widest point with no sharp corners. A Periapical tissue surrounding the apex of teeth was excised with apical resection of a portion of the root. The lesion on the right floor nostril was dissected and reconstructed with solvent dehydrated duramater and was sutured with 3/0 catgut. Afterwards, the bone cavity was filled with solvent dehydrated allogenic bone grafts. Mucoperiosteal flap was replaced to its original position and was sutured with 3/0 silk to ensure complete soft tissue coverage of the graft site. No complications were observed in the postoperative period. At the one-month recall visit, the sinus tract had been closed and 3 months later the periapical osseous repair was evident (Fig 2e). This patient has been in our observation in the last four years and the lesion has not been reoccurred.

CASE 3

A healthy 32-year-old woman was referred by her general dentist to the Ege University Department of Oral and Maxillofacial Surgery Clinic for treatment of 1 cm diameter reddish tumorlike growth on her face adjacent to the left ala of the nose (Figure 3a).

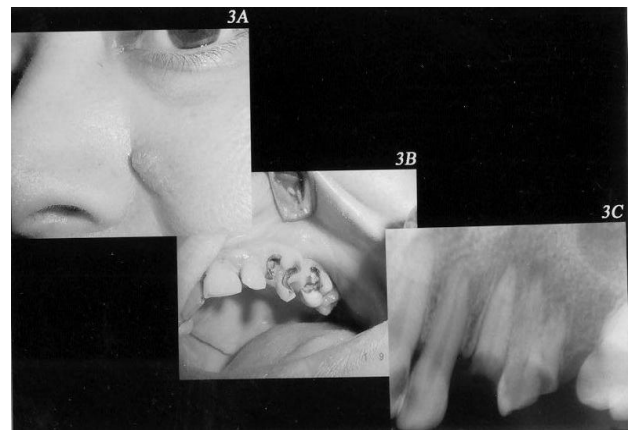


Fig 3a: Preoperative clinical appearance of draining lesion on adjacent to the left ala of the nose.

Fig 3b: Intraoral examination showing the remained roots of the canine and first premolar.

Fig 3c: Periapical radiograph showing a large radiolucency of the remained roots of the canine and first premolar.

Two previous attempts made by her dermatologist to treat the lesion using systemic antibiotherapy and simple excision of the lesion had been unsuccessful. Her medical history was not significant. The patient stated that the lesion had been present for 2 years. The patient had no complaints of dental pain or other symptoms.

We took a periapical radiograph of the affected area, which showed a large periapical radiolucency of the upper left canine and first premolar (Fig 3b, 3c).

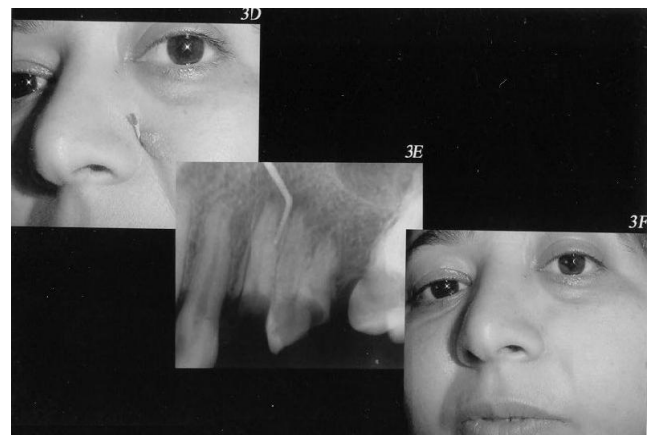


Fig 3d. The appearance of the surgical probe on adjacent to the left ala of the nose.

Fig 3e. Diagnostic radiograph showing the large lesion.

Fig 3f. The cutaneous sinus tract was healed completely with only a minimal scar six-months after treatment.

The teeth were mobile. We used gutta-percha point to trace the sinus tract exiting from the tumorlike mass and confirmed radiographically that the tract led to the remained root of the upper left canine (Figure 3d, 3e). Based on these findings, the patient was diagnosed as having an odontogenic cutaneous sinus tract secondary to chronic periapical periodontitis of the upper left canine and

first premolar. Extraction of the remained roots of the canine and first premolar was performed and apical granulation tissue was also removed. When the patient returned about 1 month later, both extraoral sinus tract and the extraoral fistula were completely resolved. Only a depressed scar remained on the left ala of the nose (Fig 3f). The patient was followed more than 2 years with no more symptoms

DISCUSSION

Periapical dental abscess may be initiated by caries, periodontal disease, trauma, or tooth injury. Most dental infections develop acute symptoms and the patients seek for early treatment however, the local inflammatory process slowly progresses and often results with extensive necrosis of the surrounding tissue. The infection may slowly tracts through the cancellous bone following the path of least resistance and perforates the cortical plate to present either intra, or extra-orally. Once pus has entered the soft tissue, its direction of spread is limited by muscles and facial planes which tend to direct the pus towards certain defined areas where it accumulates. Muscular attachments determine whether on fistula develops (Table 1). If the apices of the teeth are above the maxillary muscle attachments and below the mandibular muscle attachments the spread of infection may be extraoral. Chronic purulent drainage through the sinus tract prevents pressure build-up, and the swelling and pain typically associated with this only 50% of patients with cutaneous odontogenic sinus tracts have a history toothache (6,8). Also, the associated cutaneous lesion may develop over a long period of time and is often distant from the site of primary infection. Thus, most patients typically first visit a physician for evaluation and treatment. In addition, unsuspecting physicians of tend to overlook the possibility that a dental infection may produce a draining sinus tract. A review of case reports show that after misdiagnosis of this lesion, topical and surgical therapies are frequently attempted on cutaneous aspect of the lesion and no dental treatment is provided. Illustrating the difficulty that can be encountered, a literature review revealed one case of 32 years after the discharging lesion was first observed (1,5,7). Recognition of the cutaneous lesion as sinus tract is the first important diagnostic step. Extraoral sinus tracts may present on different locations of the face and neck. Dental involvement should always be considered even when the lesion is present in an unusual site like nasal cavity. A proper examination, pulp vitality test, and a careful questioning of the patient about symptoms may help to identify a dental aetiology (6,9). Radiographic findings are also important for the diagnosis. A periapical radiograph of the involved area often reveals a carious tooth or retained roots along with the associated periapical lesion, which may be an abscess, a granuloma, or a cyst. In both patients these lesions, which were responsible for

the formation of cutaneous sinus, were apparent in the radiograms. If the sinus tract is potent, a lachrymal probe, diagnostic wire or gutta-percha cone can be used to trace its path from the cutaneous orifice to the point of origin. In this second case, surgical probe was used because the fistula had been widened by much previous drainage. Treatment must be focused on elimination of the source of the infection. As the suggested in the literature, nonsurgical endodontic treatment or surgical root canal therapy are the treatment of choices of such lesions. If these not possible, (nonrestorable tooth) extraction of the offending tooth is indicated (10 - 12).

After the dental origin of the cutaneous sinus has been eliminated or removed, cutaneous lesion usually resolved 5 to 14 days. If the sinus tract does not close after treatment, further evaluation, including microbial sampling and biopsy, may be required. The most common alternative cause of a patent cutaneous fistula of dental origin is actinomycosis (13-16,25,27). In addition, differential diagnosis of facial lesions should include sebaceous cysts, pyogenic granulomas, basal and squamous cell carcinomas, melanoma, infections such as Syphilis and Tuberculosis, epitheliomas, dermoid, branchial, thyroglossal cysts (23,30). The treatment of extraoral odontogenic sinus tracts consists of the removal of the source of irritation. Non-surgical endodontic therapy has been advocated as the treatment of choice (9,10,17-19,23,24,26,28,30). However, occasionally this treatment has to be complemented by surgery (7,20-22) and very rarely is extraction needed (10-12,29).

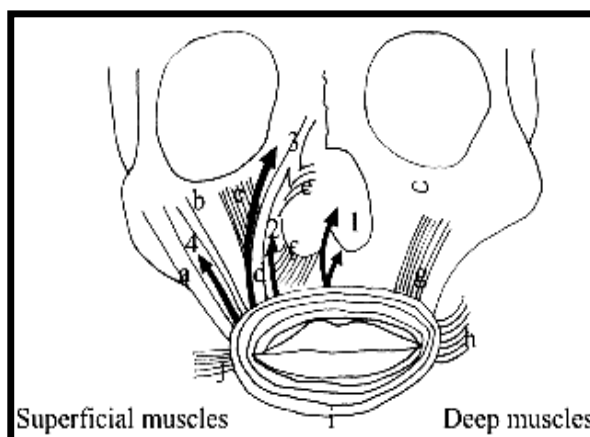


Table 1: Extraoral sites for odontogenic sinuses in the Maxilla. Legends: (a) Zygomaticus major (b) Zygomaticus minor (c) Levator Labii superioris arising from the infra-orbital foramen (d) Levator Labii superioris alaque nasi (e) Compressor nares (f) Dilator nares (g) Levator anguli oris and (h) Risorius.

1. Odontogenic sinuses tracking from the upper incisors or occasionally the lateral incisor may present in the floor of the nose or philtrum directed by dilator nares muscles.
2. A sinus may present in the lateral nasal region from infections tracking from the canine or occasionally the lateral incisor.
3. Infections tracking to the medial aspect of the eye (the danger area) usually from apical infection of the canine or first molar.
4. Odontogenic sinuses from the upper molars may rarely present on the cheek if their apices are above buccinator.

CONCLUSION

Systemic antimicrobial therapy is neither necessary nor recommended, as, this will halt the drainage only temporarily. Local excision of the lesion will not stop the drainage either, and may cause tissue breakdown that results in further facial deformity; therefore, this should be

avoided. In our experience, which is in accordance with all other similar reports, the eradication of the dental source of infection invariably terminates suppuration, institutes healing, and results in facial lesion. Communication between the dentist and the physician is suggested to provide for timely recognition and treatment of rare cases.

REFERENCES

1. Lewin Epstein J, Tricher S, Azaz B. Cutaneous sinus tracts of dental origin. *Arch Dermatol*. 1978; 114:1158-1161.
2. Sakamo E, Stratigos GT. Bilateral cutaneous sinus tracts of dental aetiology: report of case. *J Oral Surg* 1973;31:701-704.
3. Helling I, Rotstein I. A persistent oronasal sinus tract of endodontic origin. *J Endod* 1989; 15:132-134.
4. Al-Kadari AM, Al-Quoud OA, Ben-Nafi A, Gnanasekhar JD. Cutaneous sinus tracts of dental origin to the chin and cheek. *Case reports. Quint Int* 1993; 24:729-733.
5. Cioffi GA, Terezhalmay GT, Parlette HL. Cutaneous draining sinus tract: an odontogenic etiology. *J Am Acad Dermatol* 1986;14:94-100.
6. McWalter GM, Alexander JB, del Rio CE, Knott JW. Cutaneous sinus tracts of dental etiology. *Oral surg Oral Med Oral Pathol* 1988; 66:608-614.
7. Spear KL, Sheridan PJ, Perry HO. Sinus tracts to the chin and jaw of dental origin. *J Am Acad Dermatol* 1983; 32:881-884.
8. Kotecha M, Browne MK. Mandibular sinuses of dental origin. *Practitioner* 1982; 225:910-915.
9. Bender IB, Seltzer S. The oral fistula: Its diagnosis and treatment. *Oral surg* 1961;14:1367-1376.
10. Chan CP, Chang SH, Huang CC, KungWu S, Huang SK. Cutaneous sinus tract caused by vertical root fracture. *J Endod* 1997; 9:593-595.
11. Tagami H, Yoshitake K. Chronic dental fistula on the nose. *Acta Derm Venerol* 1977; 57:365-371.
12. Mahler D, Joachims HZ, Sharon a. Cutaneous dental sinus imitating skin cancer. *Br J Plast Surg* 1971; 24:78-81.
13. Shepherd JP. Osteomyelitis of the tibia following dento alveolar abscess. *Br Dent J* 1978; 145:267-268.
14. Jacobs J, Shocket E. Dermal fistula of dental origin masquerading as skin cancer. *Oral Surg* 1965; 19:184-187.
15. Puroit SD, Mathur BB, Gupta PR, et al. Tuberculous fistula of cheek. *Oral Surg* 1985; 60:41-42.
16. Goldstein BH, Scuiubba JJ, Laskin DM. Actinomycosis of the maxilla: review of literature and report of case. *J Oral Surg* 1972; 30:362-366
17. Çalıřkan MK, řen BH, Özinel MA. Treatment of extraoral sinus tracts from traumatized teeth with apical periodontitis. *Endod Dent Travmatol* 1995 ;11:115-120.
18. Jhonson BR, Remeikis NA, Van Cura JE. Diagnosis and treatment of cutaneous facial sinus tracts of dental origin. *JADA* 1999; 130:832-836.
19. Salamat K, Rezai RF. Non surgical treatment of extra oral lesions caused by necrotic non-vital tooth. *Oral Surg* 1986; 61:618-623.
20. Strader RJ, Seda HJ. Periapical abscess with internasal fistula. *Oral Surg* 1971; 32:881-884.
21. Siegel EB, Friedlander AH, Mongiardo JJ. Klebsiella pneumonia facial fistula secondary to non-vital tooth. *NY State Dent J* 1976; 42:291-292.
22. Ingle JL, Talntar JF. *Endodontics* 3rd ed. Philadelphia: Lea & Febiger, 1985:27-38.
23. Tidwell e, Jenkins JD, Ellis CD. Cedenberg RA. Cutaneous odontogenic sinus tract to the chin: A. case report. *Int Endod J* 1997; 30:352-355.
24. Foster KH, Primack PD, Kulid JC. Odontogenic cutaneous sinus tract. *J Endod* 1992; 6:304-307.
25. Lubit FA, Senzer J, Rothenberg F. Extraoral fistulas of endodontic origin: Report of two cases. *J Endod* 1976; 2:393-396.
26. Craig RM, Andrews JD, Wescott WB. Draining fistulas associated with an endodontically treated tooth. *JADA* 1984; 108:851-852.
27. Bhaskar SN, Bernier JL. Histogenesis of branchial cysts: report of 468 cases. *Am J Pathol* 1959; 35:407-423.
28. El-Swiah JM, Walker RT. Reasons for apicectomies. A retrospective study. *Endod Dent Travmatol* 1996; 12:185-191.
29. Brown DC. Advances in endodontic surgery: Part 2. *Dent Update* 1995; 10:324-328.
30. Witherow H, Washan P and Blenkinsopp P. Midline odontogenic infections: a continuing diagnostic problem. *Br J Plast Surg* 2003; 24:78-81.