

Diagnosis and treatment of odontogenic cutaneous sinus tract in mandible - A clinical report

■ Monika Bansal
T P Chaturvedi

Abstract

Odontogenic cutaneous sinus tract in the face and neck region is a rare entity and may present a diagnostic problem. It is generally misdiagnosed as a local skin lesion and maltreated by multiple antibiotic regimens, surgical excision and biopsies with eventual recurrence. Here, we discuss the case history, diagnosis and management of four patients with extra oral sinus as well as muscle affecting the spread of infection in odontogenic cutaneous sinus in various areas of mandible.

Key Words: odontogenic sinus tract, cutaneous sinus tract, odontogenic infection, mandible, muscle attachment

Introduction

Odontogenic cutaneous sinus tract in the face and neck region is a rare entity and may present a diagnostic problem^{1,2}. A review of the medical and dental literature^{1,2,3,4} reveals that cutaneous sinus tract may be due to dental problems. Correct diagnosis is the key to treating this kind of lesion that lead to a simple and effective treatment consisting of removal of necrotic pulp tissue



FIG 1: Preoperative photograph showing cutaneous lesion at the chin

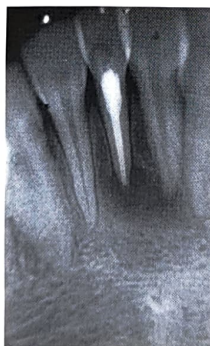


FIG 2: IOPA X-ray showing endodontic treatment in mandibular central incisor and periapical radiolucency extending from # 23 # 26



FIG 3: IOPA X-ray showing endodontic treatment in # 23 & # 26

and filling of the root canal with bio-compatible material with and without periapical surgery or even extraction resulting in minimal scarring of skin⁵. Cutaneous sinus tract is generally misdiagnosed as a local skin lesion and the patient often undergoes multiple antibiotic regimens, surgical excision and biopsies that lead to a destructive invasive treatment^{1,3}. The odontogenic cutaneous sinus tract is most commonly a sequel of periradicular abscess that arises from carious exposure, chemical irritation and trauma. On the other hand, unusual dental malformations such as dense in dente or dens invaginatus may also lead to periapical dental infection resulting in sinus tract formation^{6,7,8}. Spread of these odontogenic infections primarily depends on the balance between the general factors of host resistance and bacterial quantity and virulence and local factors such as bone, periosteum and adjacent muscles and fascia⁹. The objective of this clinical report is to give emphasis on the correct diagnosis of the odontogenic cutaneous sinus tract that can help in the prevention of loss of teeth through proper management.

Clinical Report

Four patients presented with variable complains of pain and pus or blood



FIG 4: Postoperative photograph after 9 days showing healed lesion



FIG 5: Preoperative photograph showing cutaneous lesion



FIG 6: Intraoral photograph showing severe generalized attrition

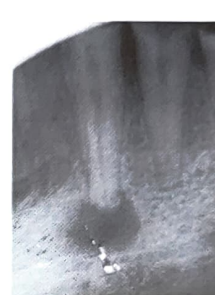


FIG 7: IOPA X-ray showing periapical radiolucency in # 22



FIG 8: IOPA X-ray showing endodontic treatment in # 22



FIG 9: Postoperative photograph after 21 days showing healed lesion



FIG 10: Preoperative photograph showing cutaneous lesion at the right side of face in mandibular premolar area

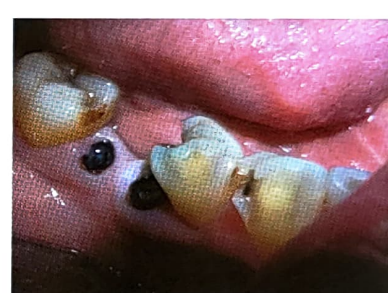


FIG 11: Intra oral photographs showing grossly carious # 28 and Root Stumps of # 29 & # 30

discharge from the different regions of mandible to Faculty of Dental Sciences, IMS, BHU, Varanasi, India.

Mandibular incisor region- A 25 years old female presented with chief complain of pain and pus discharge from the incisor region since 5 days. Past dental history revealed that she had this lesion for last 8 month. At that time she had root canal treatment of mandibular central incisor and the lesion healed with in 20 days. But the lesion again started to discharge the pus and blood. On extra oral examination, the lesion was 1 cm in diameter, erythematous and discharging pus (**Fig.1**). Intra oral examination showed no significant finding. IOPA X-ray demonstrated periapical radiolucency in the lower anterior teeth extending from #23 to # 26 and obturated mandibular central incisor (**Fig.2**). So the nonsurgical endodontic therapy of #23 & #25 was done (**Fig.3**) and the lesion healed with in 9 days (**Fig.4**). Recurrence of the lesion may be due to the extension of infection into pulp through apical region of # 23 & # 26 which was not treated initially.

Mandibular canine region- A 32 years old male with the chief complain of discharging pus and bleeding intermittently for more than eight months from the left side of the chin. His medical history was non contributory. Extraoral examination revealed an erythematous lesion of 0.5 cm in diameter and 1.5 cm below the lower border of mandible (**Fig.5**). On palpation, the lesion showed purulent and bloody discharge and fixation to the underlying bone. During intraloral examination, severe generalized attrition was present (**Fig.6**) and # 22 was tender on percussion. The tooth was firm and did not reveal any periodontal defects on probing. An IOPA X-ray demonstrated periapical radiolucency in that tooth (**Fig.7**). The tooth was nonresponsive to thermal pulp test. Thus, a diagnosis of pulpal necrosis with chronic suppurative periapical periodontitis was made. Treatment consisted of non surgical endodontic therapy of the tooth (**Fig.8**) and the cutaneous lesion was healed with in the 21 days of conventional endodontic therapy (**Fig.9**).

Mandibular premolar region- A 45 years old female with the chief complain of pus and blood discharge intermittently from the lower right posterior region since 4 months. Extraoral examination revealed nevus like lesion, 0.5cm in diameter that was depressed below the skin surface (**Fig.10**). On palpation, the lesion was fixed to the underlying bone and elicited a purulent discharge. On intraoral examination, #28 was grossly carious and root stumps of #29 & #30 were also present (**Fig.11**). No signs of periodontal pocket and mobility were present in relation to tooth # 28. IOPA X-ray showed periapical radiolucency in the # 28 (**Fig.12**). The clinical diagnosis established as chronic periapical abscess resulting from pulpal necrosis. Treatment consisted of cutaneous drainage with non surgical endodontic therapy of tooth #28 (**Fig.13**) and extraction of root stumps. The lesion healed within 10 days (**Fig.14**).

Mandibular molar region- A 40 years old female with the chief complain of pus discharge from the right side of the lower back region for more than 3 years.

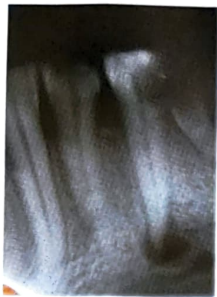


FIG 12: IOPA X-ray showing periapical radiolucency in # 28



FIG 13: IOPA X-ray showing endodontic treatment in # 28



FIG 14: Postoperative photograph after 10 days showing healed lesion



FIG 15: Preoperative photograph showing crusted cutaneous lesion with pus discharge at the right side of face in mandibular molar area

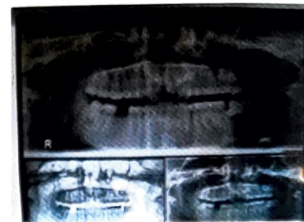


FIG 16: OPG showing dense in dente in # 32

Patient had the history of extraction of # 30 one year back for the treatment of the lesion. But the lesion did not heal and kept on discharging the pus. On extraoral examination, there was an erythematous lesion of approximately 1 cm in diameter in the right side of face in the mandibular molar area. The lesion was crusted with minimal swelling (**Fig.15**). Intraoral examination revealed no significant finding. Radiographic examination showed that # 32 had bulbous root with periapical radiolucent area suggesting that there was a invagination in that tooth which extended nearly to the apex of the root (**Fig.16**). A clinical diagnosis of dense in dente was made that was confirmed after stereomicroscopy. At that time, the extraction of # 32 was planned and the extra oral sinus healed with in one month (**Fig.17**).

Discussion

The Extraoral sinus healed in all cases by doing nonsurgical endodontic treatment except in case report 4 in which extraction was done due to developmental anomaly and location of the tooth. All patients were recalled for evaluation and reexamination and they had no recurrence of pain and swelling or pus discharge. Although few cases had depression and mild scarring at the site of lesion after healing.

The most common cause of cutaneous sinus tract is chronic periradicular abscess i.e. slow local inflammatory



FIG 17: Postoperative photograph after one month showing healed lesion

process begins in the tissue contained within the periodontal ligament. This local inflammatory process may slowly progress through the cancellous bone following the path of least resistance and perforates the cortical bone to present either intraorally or extraorally. Once pus has entered the soft tissues, its direction of spread is guided by muscle attachment. If the apices of the teeth are below the mandibular muscle attachments, the spread of infection may be Extraoral⁹. In the mandibular incisor region, relationship of mentalis muscle to the root apices determines the course of infection. In mandibular canine region, usually depressor labii inferioris, depressor anguli oris and platysma muscles are located well below the root apex therefore, periapical infection from this tooth will localize in the oral vestibule after extending through the labial cortical plate. But in case report 2, the infection presented extraorally which indicate that root apex is located below the mus-

cle attachment. In mandibular premolar region, extension of periapical infection is governed by the same muscles that confines infection from the canine tooth. In the mandibular first molar, the oblique line of buccinator attachment on the mandible, however, generally results in the root apices being above the origin of this muscle, thereby causing localization of the infection within the oral vestibule. On the lingual aspect, the apices of premolars and first molar are almost always above the attachment of mylohyoid muscle which runs parallel to the buccinator muscle. In the mandibular second molar, there is an equal chance for extraoral and intraoral sinus formation as well as buccal and lingual perforation. In the mandibular third molar, infections from the vertically positioned tooth will extend below the mylohyoid muscle and localize in the submandibular region because its apex is much closer to the lingual than to the buccal cortical plate and the attachment of mylohyoid muscle is near the alveolar margin⁹. According to several studies, the odontogenic cutaneous sinus tract found approximately 80% of the reported cases in mandibular teeth whereas 20% in maxillary teeth¹⁰.

Correct diagnosis is the key to treating this kind of lesion. The diagnosis of cutaneous sinus tract must begin with a thorough history of patient and awareness that any cutaneous lesion of face and neck region could be of dental origin^{1,2,11}. Extraorally, the sinus is charac-

terized by erythematous, symmetrical nodule, 1-20mm in diameter. Sometimes, there is crusting and periodic drainage of pus or bleeding. The lesion is depressed below the normal skin surface¹². Cutaneous sinus tract that is often distant from the site of infection, generally presents with less swelling and pain because chronic purulent drainage through sinus tract prevents pressure build up³.

Intraoral examination may reveal carious or discolored teeth and tenderness of involved teeth and adjacent alveolar mucosa. Provisional diagnosis is based on history and clinical examination which is further augmented by investigations comprising of periapical radiographs and pulp vitality test. The lacrimal probe and gutta percha cone can be introduced into the opening of patent sinus tract. After that, intraoral periapical radiograph should be exposed with the probe in situ pointing to the origin of lesion¹². After treatment of cutaneous sinus of dental origin, it usually resolved within 5 to 14 days. If sinus does not close or heal after dental 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 actinomycosis¹³. In addition differential diagnosis of cutaneous sinus tract should include developmental lesions, salivary gland lesions, and neoplasms i.e. dermoid, branchial, thyroglossal and sebaceous cysts, basal and squamous cell carcinoma, melanoma, and infections such as pustules, carbuncle, syphilis and tuberculosis^{14,15}.

The treatment of extra oral odontogenic sinus tract consists of the removal of source of irritation. Non surgical endodontic therapy has been advocated as the treatment of choice. However, occasionally this treatment has to be complemented by surgery and very rarely is extraction needed^{16,17}. Systemic antibiotics are generally not

required as the lesion is a localized entity and it usually heals after removal of source of irritation. Plastic surgical repair may be needed at a later stage if healing results in cutaneous retraction.

In conclusion, odontogenic cutaneous sinus tract is uncommon and easy to treat if recognition of these cases is done timely. Therefore, there is need of communication among physicians, surgeons, and dentists. Early diagnosis of these lesions helps in treatment that reduces the esthetic problems, patient discomfort and further complications.

References

1. Cioffi GA, Terezhalmay GT, Parlette HL. Cutaneous sinus tract: an odontogenic etiology. *J Am Acad Dermatol* 1986; 14,94
2. Lewin- Epstein J, Raicher S, Aziz B. Cutaneous sinus tracts of dental origin. *Arch Dermatol* 1978; 114:1158-1161.
3. GM, Alexander JB, delrio CE, Knott JW. Cutaneous sinus tracts of dental etiology. *Oral Surg* 1988; 66:608-614.
4. Bermick SM, Jensen JR. Chronic draining extraoral fistula of 32 years duration. *J Oral Maxillofac Surg* 1969; 27: 790-4.
5. Stoll HL, Solomon HA. Cutaneous sinuses of dental origin. *JAMA* 1963; 184: 120-4
6. Gound TG, Maixner D. Nonsurgical management of a dilacerated maxillary lateral incisor with type III dens invaginatus: a case report. *J Endod.* Jun 2004; 30(6): 448-451
7. Nallapati S. Clinical management of a maxillary lateral incisor with vital pulp and type 3 dens invaginatus: a case report. *J Endod.* Oct 2004; 30 (10) 726-31
8. Steffen H, Splieth C. Conventional treatment of dens invaginatus in maxillary lateral incisor with sinus tract : one year follow up. *J Endod.* Feb. 2005; 31 (2): 130-3.).
9. Laskin DM, Laskin JL. oral and maxillofacial surgery: Odontogenic infection of the head and neck. Volume two, The C.V.Mosby company, ST. LOUIS, MISSOURI, U.S.A, 1999; 219-221, 252
10. Hodges TP, Cohen DA, Deck D. Odontogenic Sinus tracts. *Am Family Practice* 1989; 40:113-6
11. Cohen PR, Eliezri YD. Cutaneous odontogenic sinus simulating a basal cell carcinoma: case report and Literature review. *Plast Reconstr Surg* 1990; 86: 123-7
12. Mittal N, Gupta P. Management of extra oral sinus cases: A clinical dilemma. *J Endod* 2004; 30: 541-547.
13. Goldstein BH, Scuiubba JJ, Laskin Dm. Actinomycosis of the maxilla: review of literature and report of case. *J Oral Surg* 1972; 30: 362-6)
14. Tidwell e, Jenkins JD, Ellis CD, Cedeberg RA. Cutaneous odontogenic sinus tract to the chin: a case report. *INT Endod J* 1997; 30: 352-5.
15. Witherow H, Washan P and Blenkinsopp P. Midline odontogenic infections; a continuing diagnostic problem. *Br L Plast Surg* 2003; 24: 78-81).
16. Chan CP, Chang SH, Huang CC, KungWu S, Huang SK. Cutaneous sinus tract caused by vertical root fracture. *J Endod* 1997; 9: 593-5.
17. Mahler D, Joachims HZ, Sharon A. Cutaneous dental sinus imitating skin cancer. *Br Dent. J* 1978; 145: 267-8.

Monika Bansal Senior Resident, Faculty of Dental Sciences, Institute of Medical Sciences, BHU, Varanasi

T.P.Chaturvedi Professor, Incharge of Orthodontics, Faculty of Dental Sciences, Institute of Medical Sciences, BHU, Varanasi