

# Perplexity and Repercussions in Maldiagnosis of an Extraoral Draining Sinus by a Physician and its Dental Management: A Case Report

Seerat Sidhu<sup>1</sup>, Abi M Thomas<sup>2</sup>, Ruchika Kundra<sup>3</sup>

## ABSTRACT

The cutaneous sinus of dental origin represents a skin disorder that appears due to an infection accompanied by bony changes. The remote location of the lesion relative to the primary site of the disease leads to its presumption of a skin etiology by the individual. Inadequate knowledge on the part of the physician followed by faulty management complicates the situation further. However, unless the dental cause is not addressed, the lesion does not resolve. The following case report discusses the dental management of an extraoral sinus with the aim of guiding the general public, physicians, and dentists with its accurate and timely assessment so as to avoid additional financial costs, futile antibiotic therapy courses, and unnecessary surgical excisions.

**Keywords:** Extraoral cutaneous sinus, Extraoral draining fistula, Nonhealing extraoral sinus, Odontogenic cutaneous fistula, Odontogenic cutaneous sinus tract.

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## BACKGROUND

Anomalies of bone and skin are known to coexist.<sup>1</sup> Furthermore, an underlying anatomical basis may be held liable for dental structures giving rise to cutaneous sinus tracts. Notably, children and adolescents are more vulnerable to this phenomenon since the development of their alveolar bone is not yet completed and consequently, the teeth are relatively more deeply seated in such a bone. Subsequently, the likelihood of infections from dental origin affecting the bone beyond the muscular attachments rises.<sup>2</sup> Moreover, since the dental infection is most frequently chronic by nature without any accompanying clinical symptoms, local, or subjacent soft tissues are erroneously assumed as causative factors for the skin lesions that develop at later stages of the disease by the patient.<sup>3</sup> Thus, they seek treatment from a general physician. Drastically, the physicians in turn who have the opportunity to see such cutaneous lesions over the head and neck consider their origin from the chronic dental disease a rarity.<sup>4</sup> Consequently, many patients with extraoral sinus tracts give a history of treatment with systemic/topical antibiotics, surgical procedures by general physicians and dermatologists. Eventually, after several unsuccessful treatment attempts, the patients are referred to dental practitioners to ascertain a dental etiology.

Following is a case report of a facial cutaneous sinus of dental origin in an 11-year-old boy.

## CASE DESCRIPTION

An 11-year old boy reported to the Department of Pedodontics and Preventive Dentistry with the chief complaint of purulent discharge from a nonhealing wound over the central chin area (Fig. 1). The patient recalled that the wound started 6 months ago as a small swelling and eventually developed into a skin lesion. He sought medical advice from a general physician for the same, following which he was prescribed antibiotic therapy. Excision of the skin

<sup>1-3</sup>Department of Pedodontics and Preventive Dentistry, Christian Dental College and Hospital, Ludhiana, Punjab, India

**Corresponding Author:** Seerat Sidhu, Department of Pedodontics and Preventive Dentistry, Christian Dental College and Hospital, Ludhiana, Punjab, India, Phone: +91 01636233700, e-mail: sidhuseerat93@yahoo.in

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lesion was also attempted twice. However, the lesion subsided only transiently. Finally, the patient was referred to our department to rule out any dental cause.

On the day of the examination, the patient was afebrile. Parulis was evident over the central chin area which was soft on palpation. Intraoral findings included Ellis Class II fracture w.r.t. 31 (Fig. 2), which did not respond to sensitivity tests. The patient gave a history of falls around 6 months back. Radiographically, periapical radiolucency was associated with 31 (Fig. 3). A provisional diagnosis of apical periodontitis with respect to 31 was made. Root canal therapy was decided as the appropriate treatment modality.

Access opening and biomechanical preparation w.r.t. 31 till 30K file size was done. The canal was copiously irrigated with saline and sodium hypochlorite. Irrigation resulted in squirting of the irrigation material out of the stoma which confirmed the association of the sinus tract with #31. The canal was properly dried with paper points. Following this, the triple antibiotic paste was placed in the canal for a period of 3 weeks. Thereafter, metapax was placed in the canal for a period of 2 months. Finally, the canal was obturated with gutta-percha and coronal sealing was done with composite resin restoration.



Fig. 1: Nonhealing wound over central chin area



Fig. 2: Ellis Class II fracture w.r.t. 31

## DISCUSSION

Chronic apical abscess represents an inflammatory reaction to pulpal infection and necrosis secondary to carious lesions or traumatic injuries to teeth which are characterized by gradual onset, little or no discomfort, and the intermittent discharge of pus through an associated sinus tract the opening of which can be intraoral or extraoral with the latter being the situation when the apices of the mandibular teeth are situated beneath the mandibular muscle attachments and the apices of the maxillary teeth are situated above the maxillary muscle attachments.<sup>5</sup>

Cutaneous sinus of dental origin falls under the category of a skin disorder that arises due to an infection leading to bony changes. The diagnosis is often delayed owing to the remote location of the lesion relative to the primary site of the disease.<sup>1</sup>

The foremost appearance of this lesion is a chronic, inflamed, and poorly healing wound.<sup>6</sup> Often, it is evident as an erythematous, nontender, fixed nodules or cystic lesion.<sup>5</sup> The tract gets fixated with the underlying tissues, resulting in a “depression” or retraction below the normal surface which is the most characteristic feature of the nodule.<sup>4</sup> The submandibular region and the chin represent the most common sites for the occurrence of these lesions.<sup>5</sup> Poor oral hygiene with one or more severely decayed teeth, a healthy-looking tooth with an intact crown or slight fracture of the crown may be revealed on intraoral examination<sup>6</sup> and radiographs will demonstrate the periapical radiolucencies associated with the tooth.<sup>7</sup> Resolution of the sinus tract occurs upon removal of the dental source of infection, thus, eliminating the need for surgical excision.<sup>8</sup>

This case report is important as it highlights several issues. On top of the list is the lack of knowledge on the part of general physicians regarding dental diseases. Indeed time and again, several studies and case reports have raised their concern over this particular scenario with most recently, Alrashdan et al. attempting to assess the awareness of oral medicine among Jordanian medical practitioners and they concluded that the medical practitioners were inadequately aware of oral health and related practices.<sup>9</sup> Additionally, in India a cross-sectional survey conducted by Sarumathi et al. concluded a moderate level of awareness of common oral diseases amongst primary care physicians in Chennai, India.<sup>10</sup> Parakh A et al. also found inadequate knowledge regarding oral health and disease amongst general medical practitioners in Durg, Chattisgarh.<sup>11</sup>

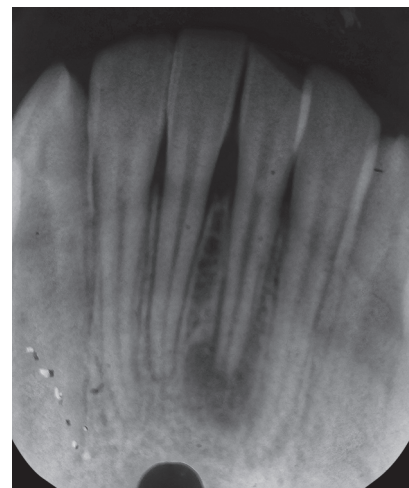


Fig. 3: Periapical radiolucency w.r.t. 31

Another issue that this case report points out toward is that sinus tracts following unresolved dental infections are not a rarity by any chance. Indeed Gupta and Hasselgren on analyzing the charts of 330 endodontically treated patients found 18% of the cases had an odontogenic sinus tract indicating that one in five teeth with periradicular inflammation have a sinus tract.<sup>12</sup>

Finally, it focuses on the mismanagement on the part of the physicians pertaining to cutaneous sinus tracts of dental origin. In addition to the numerous case reports in this regard, there have been several retrospective studies affirming this situation. Chan et al. studied 37 cases of odontogenic cutaneous sinus tracts in Taipei, Taiwan, and found 57% of cases were referred from medical doctors. In addition, fistulas were present for a duration of more than 6 months before receiving dental treatment in more than half of the cases.<sup>13</sup> Guevara-Gutierrez et al. conducted a retrospective study in Jalisco, Mexico on 75 case histories of odontogenic cutaneous fistulas and they found 49% of cases were studied for more than one probable clinical diagnosis with unnecessary studies conducted in 23% of cases.<sup>14</sup> Chowdri et al. analyzed 117 patients referred for nonhealing sinuses and fistulous tracts of the head and neck region in Srinagar, India. They found dental causes responsible for 55% of such tracts with 75% of these cases being managed by medical treatment for a duration varying from 4–28 months before a definitive diagnosis of the dental origin was established.<sup>15</sup>

In the present case, an 11-year-old boy visited the Department of Pedodontics and Preventive Dentistry with the chief complaint of a chronic, non-healing wound over the chin area. The patient gave a history of multiple antibiotic therapies and surgical excision from a general physician. Intraoral examination revealed a fractured #31. The patient recalled having fallen down around 6 months back. A periapical radiograph was taken next, which revealed a periapical radiolucency around the apex of #31. The origin of the sinus tract was judged to be the periapical radiolucency around #31. Root canal therapy was proposed as the treatment for #31.

Access opening and biomechanical preparation till 30K file size was done. The canal was copiously irrigated with saline, sodium hypochlorite, and metrogel. The antimicrobial and tissue dissolution process of sodium hypochlorite can be attributed to the saponification, amino acid neutralization, and chloramination reactions that take place with microorganisms and organic tissues.<sup>16</sup> Next, triple antibiotic paste consisting of metronidazole, ciprofloxacin, and minocycline was placed in the canal for a period of 3 weeks. They are efficient antimicrobial agents which counter the diverse flora of tooth infection and also reduce the chances of developing antibiotic-resistant bacterial strains.<sup>17</sup> In our case, healing of the sinus tract was evident after a 3 week period of this therapy (Fig. 4). Thereafter, metapex was placed inside the canal

for a period of 3 months (Fig. 5). Metapex is a silicone oil-based calcium hydroxide paste containing 38% iodoform. It exhibits enhanced antimicrobial properties which can be attributed to the combination of iodoform and oily vehicle due to which action of the medicament is exerted for a relatively long period of time.<sup>18</sup> After the 3 month period, the periapical radiolucency was markedly reduced (Fig. 6). Finally, the canal was obturated with gutta-percha (Fig. 7) and the coronal seal was completed with composite resin restoration.

Few case reports referring to the diverse causes and management options for cutaneous sinus tracts of dental origin are worth mentioning. Kakade et al. reported an unusual case of the extraoral draining sinus in a 7-year-old child that resulted from a carious, developing tooth bud of an unerupted permanent molar.<sup>19</sup> Ozdemir et al. described a case of extraoral sinus tract which arose from a periodontal pathology around the lower left first permanent molar which ultimately resulted in Garre's osteomyelitis.<sup>20</sup> Kumar SK et al. treated the extraoral sinus tract due to an endodontic infection in a single visit procedure by ensuring the elimination of microbes through profuse irrigation with chlorhexidine and sodium hypochlorite.<sup>21</sup> Lodhi et al. managed a mandibular extraoral sinus of periodontal infection in relation to permanent mandibular molar with a probing depth of 10 mm by



Fig. 4: Healing of the extraoral sinus tract after 3 weeks of therapy with triple antibiotic paste

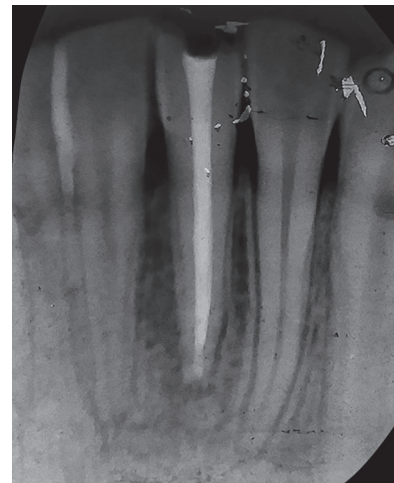


Fig. 6: Marked reduction in size of the periapical lesion after therapy with Metapex

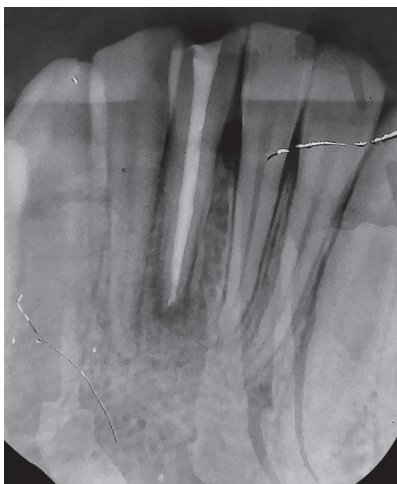


Fig. 5: Placement of Metapex in the canal



Fig. 7: Gutta-percha obturation w.r.t. 31



root canal therapy of the involved tooth and bone graft with PRF for the intrabony defect.<sup>22</sup>

After the root canal treatment, the periradicular tissues heal through the formation of a fibrin clot or granulation tissue. This is followed by the recession of the inflammation and ultimately the architecture of the periodontal ligament returns back to normal.<sup>5</sup> Once the dental source of infection is removed, the sinus tract resolves, albeit, with little dimpling and hyperpigmentation, however, these two conditions can be managed to some extent by massaging, moisturizing with silicon creams at night, and water-based creams during daytime.<sup>6</sup>

## CONCLUSION

Despite the numerous case reports and retrospective studies, calling attention to the maldiagnosis and mismanagement of cutaneous sinus tracts of dental origin by physicians, this issue still remains unaddressed. Thus, a discourse between dentists and physicians is mandatory. Physicians while ascertaining the cause of cutaneous sinus tract particularly over the head and neck should certainly include assessment of the presence of dental caries or inquire whether the patient experienced any trauma to the teeth in the past. Should such conditions exist, the physician must refer the patient to a dental surgeon as only this will remove the underlying cause and offer a permanent solution to this problem.

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