

Available online at http://www.journalcra.com

International Journal of Current Research Vol. 17, Issue, 05, pp.32778-32782, May, 2025 DOI: https://doi.org/10.24941/ijcr.48862.05.2025 INTERNATIONAL JOURNAL OF CURRENT RESEARCH

CASE REPORT

HEALING OF ODONTOGENIC EXTRAORAL CUTANEOUS SINUS TRACTS WITH CONSERVATIVE ENDODONTIC THERAPY: TWO CASE REPORTS

Dr. Madhu K Nandhini¹, Dr. Surinder Kaur^{2,*}, Dr. Haridarshan Singh Sidhu³ and Dr. Jannis Arora⁴

¹PG, Department of Pediatric and Preventive Dentistry, Government Dental College and Hospital, Patiala, India; ²Assistant Prof, & Head, Department of Pediatric and Preventive Dentistry, Government Dental College and Hospital, Patiala, India; ³Assistant Professor, Department of Pediatric and Preventive Dentistry, Government Dental College and Hospital, Patiala, India; ⁴PG Department of Pediatric and Preventive Dentistry, Government Dental College and Hospital, Patiala, India

ARTICLE INFO

Article History: Received 14th February, 2025 Received in revised form 27th March, 2025 Accepted 03rd April, 2025 Published online 28th May, 2025

Key words: Extraoral Sinus Tracts, Purulent Discharge, Open Apex.

*Corresponding author: Dr. Surinder Kaur

ABSTRACT

Introduction: Extraoral sinus tracts of endodontic origin are often clinically mistaken for a variety of other conditions. A misdiagnosis can lead to inappropriate treatment, resulting in treatment failure or delayed healing. **Case Presentation:** This report details the clinical management of two cases involving mandibular first molars presenting with extraoral sinus tracts and purulent discharge—one associated with an open apex and the other with a closed apex. Each case was treated with a specific disinfecting protocol and individualized treatment plan altered to the condition of the root apex. Both patients were followed for one year, and showed resolving of sinus. **Conclusion:** Managing extraoral sinus tracts in paediatric patients poses unique challenges. However, accurate diagnosis and a well-structured treatment plan are essential to ensure effective resolution and rapid healing, as demonstrated in both cases.

Copyright©2025, Madhu K Nandhini et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Dr. Madhu K Nandhini, Dr. Surinder Kaur, Dr. Haridarshan Singh Sidhu and Dr. Jannis Arora, 2025. "Healing of odontogenic extraoral cutaneous sinus tracts with conservative endodontic therapy: two case reports". International Journal of Current Research, 17, (05), 32778-32782.

INTRODUCTION

An extraoral sinus typically arises from a chronic odontogenic infection, most often resulting from dental caries or traumatic injury. Less frequently, it may be caused by periodontal disease or other related infections. The inflammatory or purulent exudate originating from the tooth or periodontal tissues is released through an epithelial-lined tract, which may drain either intraorally or extra orally, depending on the location of the affected tooth. In cases involving extraoral sinus tracts, the opening can occur at various facial or cervical sites, with the chin, cheeks, and mandibular angle being the most common locations. The nasal floor, however, is a rare site of occurrence. Extraoral sinus tracts are predominantly associated with mandibular teeth, accounting for about 80-87% of cases ¹. These sinus tracts, originating from dental infections, are often misdiagnosed as non-dental conditions, such as congenital midline sinuses of the upper lip, tuberculosis, osteomyelitis, neoplastic growths, folliculitis, blocked sweat glands, and other localized skin infections². In paediatric and adolescent patients, the alveolar process is underdeveloped, and the roots of the teeth are typically incomplete and situated deeper within the basal bone.

This anatomical feature increases the likelihood of an odontogenic infection extending beyond muscle attachments, potentially leading to the formation of a cutaneous sinus tract. The primary approach to treatment involves eliminating the underlying etiology and preventing recurrence. In such cases, a dental infection should be considered as the principal cause; therefore, an accurate diagnosis is essential. According to Swales et al. ³, in paediatric patients, the significance of a correct diagnosis and appropriate treatment for an extraoral cutaneous sinus was only realized when the child sought evaluation at a specialized dental clinic. The following two case reports present the management of permanent mandibular molars associated with extraoral sinus tracts—one involving an open apex and the other a closed apex.

CASE REPORT 1

A 7-year-old female patient was referred to the Department of Paediatric and Preventive Dentistry from a dermatologist with a chief complaint of pus discharge below the inferior border of the left mandible. The patient had been experiencing extraoral swelling, pus discharge, and bleeding for the past two months She had a history of receiving multiple courses of systemic antibiotics. The child had no significant medical history. Extraoral examination revealed a swelling with an erythematous area measuring approximately 1.4×1 cm, located below the left inferior border of the mandible near the mandibular angle (Figure 1). In terms of dental history, caries excavation had previously been attempted, but the patient was uncooperative. Intraoral examination revealed a deep carious lesion on tooth #36, which did not respond to either cold testing or the electric pulp tester.



Fig. 1. Extraoral photograph showing the extraoral sinus



Fig. 2. Preoperative radiograph with periapical radiolucency in the distal root



Fig. 3. Access cavity preparation under rubber dam



Fig. 4. Working length with one mm short of apex



Fig. 5. Periapical radiograph showing the MTA plug in the distal root



Fig. 6. The final radiograph showing the 4 mm of MTA apical plug



Fig. 7. Master gutta percha check for mesial canals



Fig. 8. Post-op obturation



Fig. 9. Post-op with composite restoration



Fig. 10. Clinical evaluation revealed the extraoral sinus tract healing a: 2weeks; b: 3months; c: 6months; d: one year follow up.

No intraoral swelling present in relation to the tooth. Radiographic examination revealed a periapical radiolucency involving the distal root (Figure 2). A diagnosis of pulp necrosis with a chronic periapical abscess and an associated cutaneous sinus tract was established. The treatment plan, which included apexification using mineral trioxide aggregate (MTA) for the affected tooth, was explained to the patient's father, and written consent was obtained. Under local anaesthesia with 2% lidocaine hydrochloride containing 1:80,000 epinephrine, the tooth was isolated using a rubber dam. An endodontic access cavity was prepared (Figure 3), and the canals were negotiated, with the working length established (Figure 4). Biomechanical instrumentation was completed to the established working length. The canals were irrigated sequentially with 2.5% sodium hypochlorite and 17% EDTA. After drying the canals with sterile paper points, calcium hydroxide was placed as an intracanal medicament, and the access cavity was sealed with a temporary restoration.

At the second visit, the extraoral sinus tract showed signs of healing, and the patient was asymptomatic. The treatment protocol remained consistent, including copious irrigation. An MTA apical plug of 4-5 mm was placed using stainless steel hand pluggers, leaving 1-2 mm short of the apex (Figure 5). Tooth was temporarily restored using a wet cotton pellet and final periapical radiograph was taken (Figure 6). After 24 hours, patency was achieved in both mesial canals (Figure 7), and the canals were completely obturated with gutta-percha (GP) using the lateral condensation technique (Figure 8). An appointment was scheduled for composite restoration (Figure 9) and the patient was reviewed after two weeks.

Follow up

The patient was scheduled for follow-up visits at 3, 6, and 12 months. At the 3-month review (Figure 10), satisfactory

healing was noted, and a subsequent 1-year follow-up confirmed the absence of any recurrence.

CASE REPORT 2

A 10-year-old male patient presented with a chief complaint of pain and pus discharge on the right side of the lower jaw, persisting for the past one and half month. The patient experienced moderate, intermittent throbbing pain, which was aggravated by chewing but did not interfere with his sleep or normal mastication. The patient was medically healthy with no known drug allergies. No relevant dental history. Extraoral inspection revealed a sinus tract with purulent discharge in the right submandibular region (Figure 11). Further examination revealed tenderness of the overlying skin, with purulent material expressed from the lesion upon application of pressure. On Intraoral Examination a carious mandibular right first molar (tooth #46) was observed, which was non-tender to percussion. Pulp vitality testing showed no response, indicating a non-vital pulp. There was no mobility or evidence of deep periodontal pockets associated with the tooth. Radiographic examination revealed carious tooth in relation to 46 (Figure 12).



Fig. 11. Clinical picture of extraoral draining sinus



Fig. 12. Preoperative radiograph;

Following parental consent, local anaesthesia was administered, and rubber dam isolation was achieved. Access cavity preparation was carried out, and upon deroofing the pulp chamber, the mesiobuccal (MB), mesiolingual (ML), distobuccal (DB), and distolingual (DL) canals were located and negotiated to their respective working lengths (WL).WL were confirmed using an electronic apex locator with a size 10 K-file (Figure 13). Following completion of root canal preparation using rotary instrumentation, all canals were



Fig. 13. Working length (WL) determination with initial file;



Fig. 14. Master cone radiograph



Fig. 15. Obturation



Fig.16. Post-op with core build up



Fig.17. Healed extraoral draining sinus during the review at a: one week; b: one month; c: 3months; d: 6 months

thoroughly irrigated alternately with 17% ethylenediaminetetraacetic acid (EDTA) and 2.5% sodium hypochlorite (NaOCl) solutions. Sonic activation of the irrigating solutions was carried out using the EndoActivator with a medium-sized tip for 20 seconds, enhancing the effectiveness of canal disinfection ⁴. The canals were initially dried using sterile paper points, and the cavity was temporarily restored. An antibiotic dressing, composed of a mixture of ciprofloxacin, metronidazole, and clindamycin (minocycline was avoided as it may cause discoloration) was placed within the canals. At the follow-up visit one week later, clinical examination revealed resolution of the sinus tract and absence of symptoms. The antibiotic paste was then removed, and the canals were irrigated using the same protocol. A final rinse was performed with normal saline followed by 2% chlorhexidine. After drying the canals with paper points and checking master cone GP (Figure 14), obturation was completed using guttapercha (Figure 15), and the access cavity was permanently restored with composite restoration (Figure 16).

Follow up

Healing at one week, one month, 3 months and 6 months (Figure 17) At the one-year review, the tooth remained asymptomatic, non-tender to percussion, and exhibited no abnormal mobility. Periodontal probing depths were within normal physiological limits. Radiographic evaluation revealed a reduction in the size of the apical radiolucency, indicating suggesting ongoing periapical healing.

DISCUSSION

An odontogenic cutaneous sinus tract is an abnormal pathway that develops as a result of a chronic dental infection, originating from the oral cavity and extending to drain externally through the skin of the face or neck. This condition often presents as a depressed or recessed skin lesion and may be confused with a furuncle, cyst, or ulcer ⁵. The chronic draining cutaneous sinus tracts are frequently misdiagnosed and treated inappropriately, as they may not show signs of intraoral swelling or pain. The differential diagnosis should consider a range of conditions, including osteomyelitis, myositis, granulomatous disorders, furunculosis, congenital and salivary gland fistulas, deep fungal infections, granulomatous disorders, pustular eruptions, foreign body granulomas, infected cystic lesions, suppurative lymphadenitis, and both benign and malignant neoplasms ⁶⁻⁸. Accurate diagnosis can be challenging, often due to the nonspecific clinical presentation, the extraoral location of symptoms, and the potential for misidentification as non-odontogenic conditions. According to Kumar et al., odontogenic causes account for about 80% of reported cases of cutaneous sinuses in the cervicofacial area ⁹. The inflammatory response typically starts in the necrotic pulp, spreading to the surrounding periodontal tissues and bone,

leading to osteoclastic resorption. Fluids from this immune process may accumulate within the bone or eventually breach the cortical bone and periosteum, flowing into soft tissue spaces following the path of least resistance. Extraoral sinuses are more likely to occur than intraoral ones when the apices of the maxillary teeth are located above the muscle attachment or when the apices of the mandibular teeth are situated below it ¹⁰. A significant proportion of reported cases are associated with mandibular teeth, with extraoral drainage most frequently presenting through the skin of the chin or the mandibular angle. Conversely, maxillary teeth are implicated in approximately 20% of cases, where sinus tract openings are more commonly observed in the upper lip, philtrum, nasolabial fold, nasal ala, or infraorbital region. The management of infected immature teeth in paediatric patients presents more significant challenges. The primary goal in treating extraoral draining sinuses is to eliminate the infection source. Non-surgical root canal treatment is the first-line option and offers the most conservative approach. The prognosis of endodontic therapy is largely dependent on effective cleaning, shaping, disinfection, and the complete three- dimensional sealing of the root canals. For effective disinfecting calcium hydroxide Ca (OH) is the most widely used medicament. A triple antibiotic paste, consisting of ciprofloxacin, metronidazole, and minocycline, serves as an effective alternative, especially for targeting anaerobic bacterial populations. Furthermore, a proper seal is essential for the effective management and long-term success of immature teeth in paediatric patients.

CONCLUSION

Odontogenic cutaneous sinuses are uncommon and frequently misdiagnosed, which can lead to improper management. The cases emphasize that the successful management of extraoral sinuses depends primarily on prompt and accurate diagnosis, effective infection elimination, and proper disinfection and sealing.

REFERENCES

1. Mittal N, Gupta P. Management of extra oral sinus cases: a clinical dilemma. Journal of endodontics. 2004 Jul 1;30(7):541-7.

- Swales 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. International Journal of paediatric dentistry. 2016 Sep;26(5):391-400.
- Azizlou E, Sobhani MA, Ghabraei S, Khoshkhounejad M, Ghorbanzadeh A, Tahan SS. Extraoral sinus tracts of odontogenic origin: a case series. Frontiers in Dentistry. 2020 Nov 12;17:29.
- 4. Niu LN, Luo XJ, Li GH, Bortoluzzi EA, Mao J, Chen JH, Gutmann JL, Pashley DH, Tay FR. Effects of different sonic activation protocols on debridement efficacy in teeth with single-rooted canals. Journal of dentistry. 2014 Aug 1;42(8):1001-9.
- 5. Curvers F, De Haes P, Lambrechts P. Non-surgical endodontic therapy as treatment of choice for a misdiagnosed recurring extraoral sinus tract. European Endodontic Journal. 2017 Jan 1;2(1):13.
- 6. Bashar AK, Akter K, Chaudhary GK, Rahman A. Primary molar with chronic periapical abscess showing atypical presentation of simultaneous extraoral and intraoral sinus tract with multiple stomata. BMJ Case Reports CP. 2019 Sep 1;12(9):e229039.
- Sammut S, Malden N, Lopes V. Facial cutaneous sinuses of dental origin-a diagnostic challenge. British dental journal. 2013 Dec;215(11):555-8.
- 8. Brown RS, Jones R, Feimster T, Sam FE. Cutaneous sinus tracts (or emerging sinus tracts) of odontogenic origin: a report of 3 cases. Clinical, cosmetic and investigational dentistry. 2010 Jul 5:63-7.
- Kishore Kumar RV, Devireddy SK, Gali RS, Chaithanyaa N, Chakravarthy C, Kumarvelu C. Cutaneous sinuses of cervicofacial region: a clinical study of 200 cases. Journal of maxillofacial and oral surgery. 2012 Dec;11:411-5.
- 10. Gupta M, Das D, Kapur R, Sibal N. A clinical predicament—diagnosis and differential diagnosis of cutaneous facial sinus tracts of dental origin: a series of case reports. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2011 Dec 1;112(6):e132-6.
