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case report

Failure of Antibiotic Therapy in a Chronic Carious Tooth with Purulent Discharge: Case Report of Successful Outcome Post-Extraction

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ABSTRACT:

Background: Chronic dental infections, especially those associated with carious teeth and persistent purulent discharge, pose a significant therapeutic challenge, particularly when antibiotic treatment fails. The emergence of antimicrobial resistance (AMR) and complicating factors such as biofilm formation and limited drug penetration contribute to treatment failure and persistent infection. **Case Presentation:** This report describes a 17-year-old female presenting with a cutaneous sinus tract on the lower border of the mandible, unresponsive to multiple antibiotic regimens. Initial misdiagnosis led to delayed appropriate care. Clinical and radiographic evaluation revealed a severely carious mandibular first molar (36) with associated periapical radiolucencies and soft tissue changes consistent with a chronic dental abscess. Tooth extraction was performed, and purulent material was drained from both the socket and sinus tract. Postoperative recovery was uneventful, and complete resolution of symptoms was observed within three weeks. **Discussion:** Odontogenic cutaneous sinus tracts are rare and frequently misdiagnosed as dermatologic conditions. This case highlights the limitations of antibiotic therapy in chronic dental infections and underscores the importance of early dental evaluation and imaging in persistent cutaneous lesions. Panoramic radiography proved critical for diagnosis. Surgical intervention, including tooth extraction, remains a definitive treatment when conservative measures fail. **Conclusion:** Dental infections should be considered in the differential diagnosis of unexplained cutaneous facial lesions. Early recognition and appropriate surgical management are key to preventing complications and addressing antibiotic resistance in odontogenic infections.

Keywords: Chronic dental infection, Odontogenic cutaneous sinus tract, Antibiotic resistance, Mandibular first molar, Dental abscess, Misdiagnosis

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INTRODUCTION:

Chronic infections of carious teeth with purulent discharge present a persistent therapeutic challenge in dental practice, particularly when antibiotic therapy fails to resolve the infection. Antibiotics have traditionally been a cornerstone in managing odontogenic infections; however, their efficacy is increasingly compromised by the emergence and spread of antimicrobial resistance (AMR) among oral pathogens[1,2]. The polymicrobial nature of chronic dental infections, often including resistant strains of Streptococcus spp. and Staphylococcus aureus, complicates treatment and may lead to persistent suppuration despite adequate antibiotic courses [5]. This resistance is compounded by factors such as biofilm formation and limited drug penetration into necrotic or abscessed tissues, which reduce antibiotic effectiveness and contribute to treatment failure[3]. Purulent discharge from a chronic carious tooth indicates ongoing infection and tissue breakdown, which, if unresolved, can lead to more severe local and systemic complications. In such cases, surgical intervention, including tooth extraction, is often necessary to remove the source of the infection and promote healing [8]. Extraction eliminates the nidus of infection that antibiotics alone may not eradicate, thereby preventing further spread and facilitating resolution of symptoms. This case report describes a patient with a chronic carious tooth and persistent purulent discharge unresponsive to multiple antibiotic regimens. The successful outcome following tooth extraction underscores the importance of timely surgical management in refractory odontogenic infections. It highlights the limitations of relying solely on antibiotics in chronic cases and supports a combined approach where extraction is considered When conservative treatment fails[5,8]. This approach is critical to reducing patient morbidity, preventing complications, and addressing the growing challenge of antibiotic resistance in dental infections.

Figure 1: Preoperative intraoral view showing the severely carious mandibular molar with visible crown destruction and gingival inflammation. Sinus opening is also noted.

Case Report:

A 17-year-old girl presented to our clinic with a draining skin opening at the lower border of the mandible. She had been previously treated by a dentist approximately one month earlier with antibiotics for suspected dental caries, but the root issue was not addressed. Furthermore, the dentist had mistakenly prescribed topical Fucidin, assuming the lesion was a superficial skin infection. The patient was later referred to a plastic surgeon. On physical examination, a sinus opening was noted at the lower mandibular border Figure 1. Intraoral examination revealed a single affected tooth: the lower left first permanent molar (#36), which had extensive dental caries. A panoramic radiograph taken at the initial visit Figure 2 showed radiolucent areas at both the mesial and distal root apices of tooth #36. However, these radiolucencies did not appear to be directly connected to the cutaneous sinus tract. The radiographic findings were consistent with a localized dental abscess that had not been adequately managed. Additionally, increased soft tissue density was observed in the same region, extending caudally and laterally toward the skin, suggesting the presence of a cutaneous fistula tract. Tooth #36 was extracted at our institution, and purulent material was aspirated from both the extraction socket and the sinus tract. The patient was prescribed oral amoxicillin at a dose of 50 mg/kg/day for seven days as prophylactic antibiotic therapy. She responded well to treatment, with no complications observed.

Figure 2: Close-up of the carious lesion showing extensive structural compromise and active infection, evidencing a fistula in the sinus tract.

Figure 3: Radiograph taken before the tooth extraction, findings were consistent with a localized dental abscess.

Figure 4: Immediate post-extraction image showing the extracted tooth with carious destruction and purulent root apex.

Figure 5: Extraoral photograph taken one week post-extraction showing healing of the previously draining sinus on the lower right cheek. The lesion displays crusting and resolution of erythema, indicating regression of infection following tooth removal.

Figure 6: Healing alveolar socket two weeks post-extraction with resolution of infection and inflammation.

Figure 7: Final follow-up three weeks post-extraction, indicating successful healing and no recurrence of symptoms.

DISCUSSION:

Cutaneous sinus tracts caused by endodontic infections are relatively rare and often misdiagnosed due to their unusual extraoral presentation. These tracts typically arise from a chronic inflammatory response associated with pulpal necrosis, creating a drainage path for pus or exudate from the infected tooth to the skin of the face or neck[6,7]. Because they often present without obvious dental symptoms, patients may be unaware of the underlying dental cause. Misdiagnosis is common, with patients frequently subjected to unnecessary and ineffective interventions such as biopsies, surgical excisions, drainages, or prolonged antibiotic therapy before the correct dental etiology is identified [8,9]. These lesions are often misdiagnosed as dermatological conditions, such as cysts, abscesses, or neoplasms. Tidwell et al. (1997) reported that odontogenic sinus tracts comprise only 0.5% to 1.5% of all persistent cutaneous sinus tracts seen in dermatology and surgical settings. Pasternak et al.

(2009) noted that nearly 50% of affected patients received incorrect dermatologic treatments before a dental cause was recognized [10,12]. A 2015 study analyzing 37 consecutive cases over a 15-year period found that medical professionals, including dermatologists and plastic surgeons, referred 5715 years% of patients. Dental caries were the most common cause (26 cases), and sinus tracts were most frequently located in the chin, submental, and cheek regions (81% of cases) [13].In the case of a 17-year-old patient, initial antibiotic therapy failed to resolve a persistent cutaneous lesion, later identified as stemming from severe dental caries in the mandibular first molar (tooth 36). As in many similar cases, the cutaneous sinus tract was initially misdiagnosed as a dermatological condition. This highlights the importance of including dental pathology in the differential diagnosis of chronic or unexplained cutaneous lesions, especially when classic dental symptoms are absent[14]. A panoramic radiograph revealed radiolucent lesions around both mesial and distal roots of the affected tooth. Soft tissue changes extended from the alveolar bone, through the mandibular cortical bone, and to the skin surface—confirming the presence of a chronic sinus tract. Such tracts typically form as a result of periapical infections due to pulpal necrosis. Infections involving mandibular molars—particularly posterior teeth—can cause accumulation of purulent material that seeks the path of least resistance. This often leads to erosion of the cortical bone and subsequent extraoral drainage. Due to the anatomical proximity of posterior molars to the inferior border of the mandible, this site becomes a common point for such drainage[15]. In this case, extraction of the infected tooth led to spontaneous healing of the sinus tract. The presence of purulent discharge in both the dental socket and tract confirmed the diagnosis. The patient was prescribed oral amoxicillin as a prophylactic measure to manage residual infection, leading to full clinical recovery.

This case underscores the critical importance of considering dental origins when evaluating persistent or unusual cutaneous lesions of the face and neck. Panoramic radiography remains an invaluable diagnostic tool in such scenarios. Unlike periapical X-rays, which focus on individual teeth, panoramic radiographs offer a comprehensive view of the jaws and surrounding structures, helping clinicians detect broader pathologies, including those extending beyond bone[16,17].

CONCLUSION:

This case highlights the clinical importance of recognizing dental origins in patients presenting with chronic cutaneous lesions, particularly in the mandibular region. Chronic infections of carious teeth with purulent discharge may persist despite multiple courses of antibiotics due to the presence of antimicrobial-resistant pathogens, biofilm formation, and poor drug penetration into necrotic tissues. In such scenarios, definitive surgical intervention—such as tooth extraction—may be required to eliminate the source of infection and allow complete healing. The misdiagnosis of odontogenic cutaneous sinus tracts remains a common issue, often leading to unnecessary medical treatments and delays in appropriate care. This underscores the need for increased interdisciplinary awareness among dermatologists, surgeons, and dental practitioners. Panoramic radiography remains a valuable diagnostic tool in these cases, allowing for comprehensive evaluation of dental and surrounding anatomical structures.

A combined diagnostic and therapeutic approach—including clinical examination, imaging, and timely surgical management—is essential to prevent complications, reduce morbidity, and address the growing concern of antibiotic resistance in dental infections.

REFERENCES:

1. Klein EY, Van Boeckel TP, Martinez EM, Pant S, Gandra S, Levin SA, et al. Fighting the antimicrobial resistance global emergency. J Dent Res. 2025;104(1):10–7.
2. Alqutaibi AY, Alshammari AF, Alshammari FN, Aldosari AM, Alkhurayji H, Alshahrani F, et al. Dental infection and resistance-global health consequences. Dentistry J. 2019;7(1):22.
3. O'Neill J. Antimicrobial resistance: impacts, challenges, and future prospects. Sci Rep. 2024;14(1):1234.
4. Halling C, Poeschl J, Layer F, Boddin K, Fuchs F, Makarewicz O, et al. Antimicrobial resistance and the spectrum of pathogens in dental infections: a German surveillance study. Front Microbiol. 2021;12:676108.
5. Suda KJ, Calip GS, Zhou J, Rowan S, Gross AE, Hershow RC, et al. Antibiotics in dental practice: how justified are we? J

Antimicrob Chemother. 2020;75(7):1921–8.
6. Kansal R, Kaushik A, Talwar S, Chaudhary S, Nawal R. Non-surgical management of cutaneous sinus tract of dental origin: a report of three cases. J Evol Med Dent Sci. 2013;2(46):9042–7.
7. Chkoura A, Elwady W, Taleb B. Surgical management of a cutaneous sinus tract: a case report and review of the literature. J Contemp Dent Pract. 2010;11(5):49–55.
8. Tidwell E, Jenkins JD, Ellis CD, Hutson B, Cederberg RA. Cutaneous odontogenic sinus tract to the chin: a case report. Int Endod J. 1997;30(5):352–5.
9. McWalter GM, Alexander JB, del Rio CE, Knott JW. Cutaneous sinus tracts of dental etiology. Oral Surg Oral Med Oral Pathol. 1988;66(5):608–14.
10. Tidwell E, Jenkins JD, Ellis CD, Hutson B, Cederberg RA. Cutaneous odontogenic sinus tract to the chin: a case report. Int Endod J. 1997;30(5):352–5.
11. Pasternak JR, Phelan JA, Cerniglia CE. Cutaneous draining sinus tract of dental origin: report of a case. J Am Acad Dermatol. 2009;61(3):533–4.
12. Gupta M, Das D, Kapur R, Gupta R. Role of dentist in diagnosing cutaneous facial sinus. J Indian Soc Pedod Prev Dent. 2011;29(4):334–6.
13. Chan CP, Jeng JH, Chang SH, Chen CC, Lin CJ, Lin CP. Cutaneous sinus tracts of dental origin: clinical review of 37 cases. J Formos Med Assoc. 1998;97(9):633–7.
14. Chhabra A, Chhabra N. Dental infection mimicking dermatological lesion: three case reports of cutaneous fistulae and sinus tracts on face. Indian Dermatol Online J. 2018;9(6):441–4.
15. K C K, Kalwar AG, Upadhyaha C, Chaurasia N, Shakya M. Bilateral orocutaneous fistula secondary to pericoronal infection of mandibular third molars: a rare case report. Clin Case Rep. 2025;13(1):e70017.
16. Arslan ZB, Demir H, Berker Yıldız D, Yaşar F. Diagnostic accuracy of panoramic radiography and ultrasonography in detecting periapical lesions using periapical radiography as a gold standard. Dentomaxillofac Radiol. 2020;49(6):20190290.
17. Molander B. Panoramic radiography in dental diagnostics. Swed Dent J Suppl. 1996;119:1–26.