CASE REPORT / *CAS CLINIQUE*

Endodontics / *Endodontie*

DIAGNOSIS AND ENDODONTIC TREATMENT OF ODONTOGENIC CUTANEOUS SINUS TRACTS: A REPORT OF TWO CASES

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Introduction: The odontogenic cutaneous sinus tract (OCST), caused by pulp necrosis, creates connections between pathological spaces and anatomical structures. Extraoral manifestations pose diagnostic challenges leading to inappropriate treatments such as multiple surgery and antibiotic therapies. Effective management requires the treatment of dental pathology through endodontic therapy or extraction. This paper presents two cases of OCST and emphasizes the importance of accurate diagnosis and successful non-surgical endodontic treatment.

Observations: Case report 1: A 23-year-old male patient referred by his dermatologist with a cutaneous sinus tract on his chin that had appeared five years ago. During this period, he reported spontaneous pain and pus discharge from the chin area. The examination revealed a periapical lesion associated with tooth number 31. Cone beam computed tomography (CBCT) revealed the existence of a localized perforation on the buccal alveolar table and a second root canal of the tooth. After six months of follow-up, the cutaneous sinus tract was significantly improved by the appropriate endodontic treatment.
Case report 2: A 36-year-old female patient was referred by her dentist to examine a chin lesion that had appeared a month ago. In clinical examination and radiographic assessment, periapical lesion associated with two mandibular central incisor teeth #41 and #31 was observed. After identifying the source of infection, endodontic treatment was carried out, and a good improvement in fistula was observed after one month.

Conclusions: The correct diagnosis and treatment of OCST are important for healing. CBCT aids to identify odontogenic origin of the sinus tract through the detection of apical periodontitis and bone lesion. Root canal therapy is the treatment of choice for these cases and should always be attempted first. Monitoring the patients is necessary until complete healing of the disease.

Keywords: Odontogenic cutaneous sinus tract, Periapical lesion, Chin lesion, Misdiagnosis, Cone-beam computed tomography, Root canal treatment

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DIAGNOSTIC ET TRAITEMENT ENDODONTIQUE DES FISTULES CUTANÉES D'ORIGINE DENTAIRE: RAPPORT DE DEUX CAS

Introduction: La fistule cutanée d'origine endodontique, causée par la nécrose pulpaire, crée des connexions entre les espaces pathologiques et les structures anatomiques. Les manifestations extra-orales posent des problèmes de diagnostic qui conduisent à des traitements inappropriés tels que des interventions chirurgicales multiples et des thérapies antibiotiques. Une prise en charge efficace nécessite le traitement de la pathologie dentaire par un traitement endodontique ou une extraction. Cet article présente deux cas de fistule cutanée d'origine endodontique et souligne l'importance d'un diagnostic précis et d'un traitement endodontique non chirurgical réussi.

Observations: Rapport de cas 1 : Un homme de 23 ans a été adressé par son dermatologue pour une fistule cutanée au niveau du menton apparue il y a cinq ans. Au cours de cette période, il a signalé des douleurs spontanées et des écoulements de pus au niveau du menton. L'examen a révélé une lésion périapicale associée à la dent numéro 31. La tomographie volumique à faisceau conique (TVFC) a révélé l'existence d'une perforation localisée sur la table alvéolaire buccale et d'un deuxième canal radiculaire de la dent. Après six mois de suivi, le traitement endodontique approprié a permis d'améliorer de manière significative la fistule cutanée d'origine endodontique. Rapport de cas 2 : Une patiente de 36 ans a été adressée par son dentiste pour examiner une lésion au niveau du menton apparue il y a un mois. L'examen clinique et radiographique a révélé une lésion périapicale associée à deux incisives centrales mandibulaires (41 et 31). Après avoir identifié la source de l'infection, un traitement endodontique a été réalisé et une bonne amélioration de la fistule a été observée après un mois.

Conclusions: Le diagnostic et le traitement corrects des fistules cutanées d'origine endodontique sont importants pour la guérison. Le CBCT permet d'identifier l'origine odontogène de la fistule cutanée grâce à la détection d'une parodontite apicale et d'une lésion osseuse. Le traitement endodontique est le traitement de choix pour ces cas et doit toujours être tenté en premier. Le suivi des patients est nécessaire jusqu'à la guérison complète de la pathologie.

Mots clés: Fistule cutanée d'origine endodontique, lésion périapicale, lésion du menton, Erreur de diagnostic, Tomographie volumique à faisceau conique, traitement du canal radiculaire.

Introduction

Odontogenic sinus tract can be defined as a communication between pathologic space and anatomic body cavity or between pathologic space and the skin which may or may not be lined with epithelium [1].

The path with the lowest resistance can determine where the sinus tract will be located which can often be extraoral.

During the intraoral examination, it is possible to locate the opening of the sinus tract either in the attached buccal mucosa or vestibule.

In cases of extraoral manifestation, the sinus tract can emerge anywhere on the face or neck, with common locations including the cheeks, chin, angle of the mandible, and nasal floor [2].

Approximately 80% of cutaneous dental sinus tracts originate from mandibular teeth, with nearly half of these lesions specifically associated with anterior mandibular teeth [3].

Caries and dental traumas lead to pulpal necrosis following bacterial invasion of the dental pulp [4].

Chronic apical affections can be presented as a dental granuloma, periradicular cyst, or cutaneous sinus tract when these bacteria migrate to the periapical space [2, 5].

The presence of extraoral sinus tracts of dental origin presents a diagnostic challenge as teeth are mainly asymptomatic [6].

It is possible for this pathology to be misdiagnosed with a number of other conditions, including local cutaneous infections, osteomyelitis, neoplasms, ingrown hair or occluded sweat gland ducts, tuberculosis, actinomycosis, and congenital midline sinus of the upper lip [2, 7].

Patients with these types of lesions often receive multiple surgical excisions, radiotherapy, multiple biopsies, and various antibiotic therapy protocols [8, 9].

The optimal approach to addressing sinus tracts of endodontic origin is through the removal of the source of infection. This may be achieved through endodontic treatment (in cases where tooth restoration is an option) or tooth extraction (when restoration is not possible) [3, 8].

The objective of this article was to report through two clinical cases the diagnosis and endodontic management of odontogenic cutaneous sinus tracts. The six-months follow-up of the first case and the one-month follow-up of the second case demonstrated favorable outcomes.

Observations

Case report 1

Presentation

A 23-year-old male patient consulted the Department of Conservative Dentistry and Endodontics at the Military Principal Hospital of Instruction, Tunis, Tunisia.

His dermatologist referred him for a cutaneous sinus tract in his chin that has developed in the past five years. Over the course of five years, he complained of spontaneous pain and pus discharge from an opening located on the lower chin area.

The dermatologist prescribed the patient several courses of antibiotics.

There were no reported medical conditions in the patient's medical history. He had no known allergies and was not taking any medication.

Extraoral examination revealed a small swelling enlargement of 10 mm in diameter in the submental region, associated with discomfort and purulent discharge in the area (Figure 1).

Palpation revealed the existence of a cord-like tissue. Intraorally, the central mandibular incisor number 31 exhibited dichromatism, was asymptomatic, and had a temporary filling in the access cavity (Figure 2).

No deep periodontal pockets were evident. The tooth exhibited tenderness upon percussion. Intraoral periapical radiograph revealed a periapical lesion associated with the tooth 31, along with an incomplete endodontic filling (Figure 3).

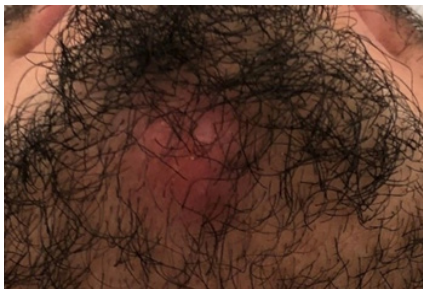

Figure 1. Extraoral view of sinus draining on the chin.

Figure 2. Intraoral view.

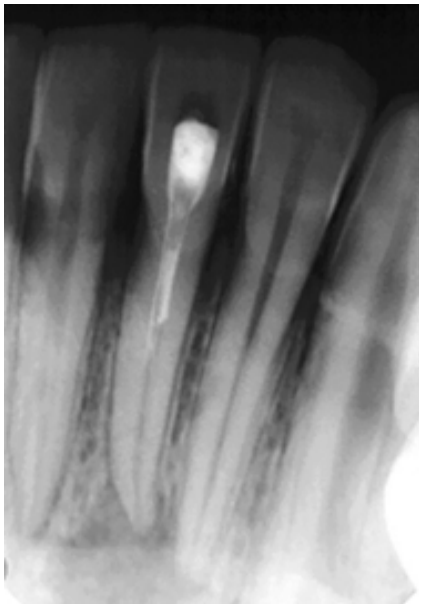

Figure 3. Intraoral periapical radiograph.

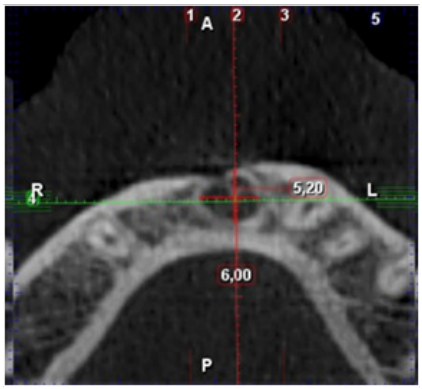

Figure 4. An axial slice of CBCT confirmed the existence of a periapical lesion associated with tooth 31.

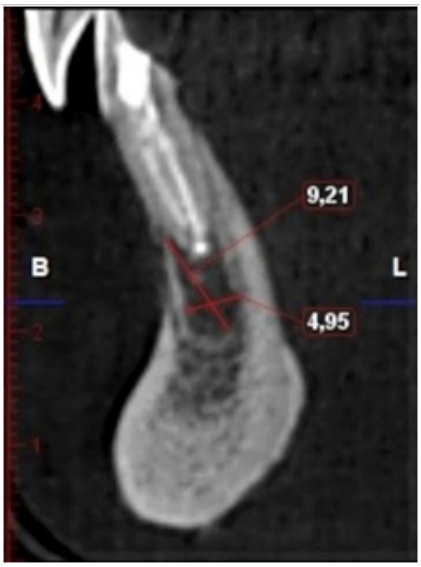

Figure 5. Sagittal slice of CBCT confirmed the presence of a second root canal of tooth 31.

Figure 6. Postoperative radiograph.

A cone beam computed tomography was performed to detect the presence of an apical lesion. A periapical lesion was found to be associated with tooth 31, as confirmed by the axial slice.

In addition, it showed a perforation on the buccal plate near the affected tooth (Figure 4). Sagittal section confirmed the presence of a secondary canal on the mentionned tooth (Figure 5).

The periapical lesion reached 9 mm in size, which is classified as 5D according to the Periapical Index classification (Estrela et al. 2008).

Tooth 31 was diagnosed with chronic periradicular lesion and extraoral cutaneous sinus tract.

Therapeutic intervention and follow-up

In the first visit, under isolation by rubber dam (Hygenic Dental Dam, Coltene), endodontic retreatment of tooth 31 was initiated.

Rotary files (R-Endo® system, MicroMega) were utilized to remove the previous root canal filling.

The working length was established with the assistance of an electronic apex locator (Root ZX mini, Morita), and the biomechanical preparation of the canals was carried out using rotary files (REVO S+ system, GenENDO by MicroMega), with concurrent irrigation using 3% sodium hypochlorite.

Canals were dried using sterilized paper points (Spident) and calcium hydroxide medicament (Metapaste, Meta Biomed) was placed. Access cavity was sealed with a temporary filling material (MD-Temp Plus, Meta Biomed).

Upon reevaluation two weeks later, the patient exhibited cessation of the external discharge, indicating initial healing of the cutaneous lesion.

The canals were reinstrumented with the last rotary file (25, 04%), of the rotary sequence, previously used during the first visit, to remove calcium hydroxide.

In each canal, 17% ethylenediaminetetraacetic acid (MD-cleanser, Meta Biomed) was applied for one minute to remove smear layers, followed by final rinse of saline solution.

Endodontic obturation was conducted using a master gutta-percha cone (25, 04%) and a resin-based sealing cement (ADSEAL plus, Meta Biomed) (Figure 6).

The tooth was restored using permanent composite restoration (EsCom® 250, Spident).

Figure 7. Periapical radiograph at 6 months follow up.

Figure 8. Clinical view at 6 months follow up.

After 6 months of follow-up, good improvement of the fistula was observed (Figures 7 and 8).

Case report 2

Presentation

A 36-year-old female patient consulted the Department of Conservative Dentistry and Endodontics at the Military Principal Hospital of Instruction, Tunis, Tunisia.

The patient was referred by her dentist for evaluation of a chin lesion.

The patient indicated that the sinus tract had appeared one-month prior, following an abscess episode a year and a half ago. The patient

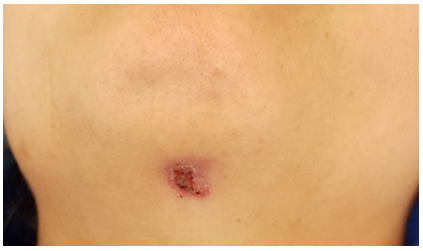

Figure 9. Pre-operative extraoral view of the sinus tract.

Figure 10. Intraoral view.

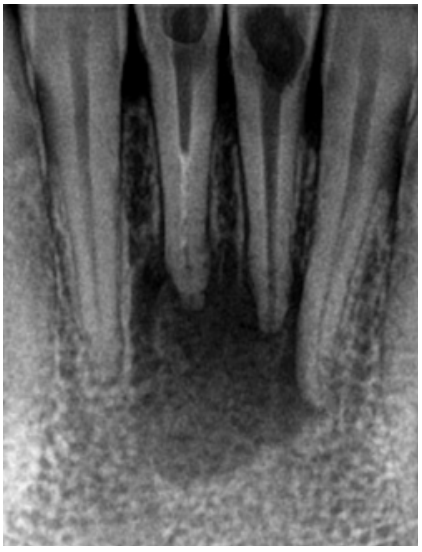

Figure 11. Periapical radiograph of the suspected teeth.

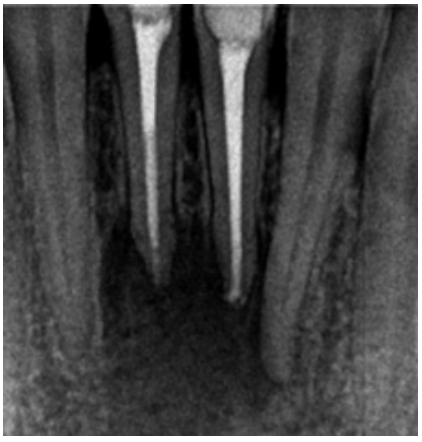

Figure 12. Final radiograph of the endodontic treatment.

had an ancient trauma from a car accident.

A review of the patient's medical history revealed no documented medical conditions. The patient did not take any medication and reported no known allergies.

Clinical extraoral examination revealed a swollen, cutaneous, crusted, erythematous draining fistula inferior to the chin (Figure 9).

Intraorally, the two mandibular central incisor teeth 41 and 31 were asymptomatic with discoloration and presence of access cavities (Figure 10).

Periapical radiograph demonstrated a diffuse radiolucency surrounding the apices of teeth 41 and 31 (Figure 11).

The tooth #41 exhibited incomplete endodontic filling, while the tooth #31 showed an access cavity with absence of endodontic obturation.

A diagnosis was established of chronic periradicular periodontitis and an extraoral cutaneous sinus tract associated with teeth 41 and 31.

Therapeutic intervention and follow-up

Due to the patient's limited availability for treatment, the two mandibular central incisor teeth (41 and 31) were programmed for one visit treatment.

Root canal retreatment was initiated for the tooth 41 under isolation by rubber dam (Hygenic Dental Dam, Coltene).

Rotary files (R-Endo® system, MicroMega) were utilized to remove the previous root canal filling.

The working length was determined using an electronic apex locator (Root ZX mini, Morita), and the biomechanical preparation of the root canals of teeth 41 and 31 was carried out using rotary files (Rcs Rainbow One File 25, 04%, Ramo Medical), while flushing with 3% sodium hypochlorite.

To remove smear layers, 17% ethylenediaminetetraacetic acid (MD-cleanser, Meta Biomed) was applied for one minute in each canal, followed by final rinse of saline solution.

Figure 13. Clinical follow-up after 1 month.

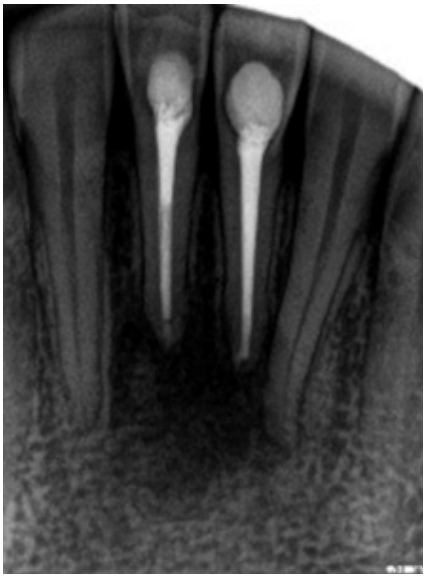

Figure 14. Radiographic follow-up after 1 month.

Root canal fillings were performed with Obturators 25 (HEROfill system, MicroMega) and a resin-based sealing cement (ADSEAL plus, Meta Biomed) (Figure 12).

The teeth were restored with permanent composite restorations (EsCom® 250, Spident).

The second visit took place after 1 month, clinical and radiographic examination revealed good improvement of the fistula (Figures 13 and 14).

Discussion

Chronic apical abscesses are the result of an inflammatory response to pulpal infections and necrosis caused by carious lesions or traumatic injuries to teeth. These

abscesses typically present with a gradual onset, minimal or no discomfort, and intermittent pus discharge through an associated sinus tract. The sinus tract opening can be intraoral or extraoral [10, 11].

The location of the fistula is dependent on a number of factors, including the position of the affected tooth, the length of its root, the location and strength of surrounding muscle attachments, the severity of the infection, the density and distribution of subcutaneous tissue, the thickness of the cortical bone and the influence of gravity [12].

The intermittent discharge of pus through an associated sinus tract (potentially with an extraoral opening) is a condition that occurs when the apices of the mandibular teeth are positioned beneath the mandibular muscle attachments, while the apices of the maxillary teeth are located above the maxillary muscle attachments [10, 13].

A cutaneous sinus tract may present clinically as an infected pimple, nodule, ulcer, or indurate cystic area on the skin. The differential diagnosis includes infected epidermoid, sebaceous, or thyroglossal cysts, furuncle, congenital fistula, foreign body reaction, granulomatous disorder, basal or squamous cell carcinoma. Furthermore, it is important to consider infective causes, particularly in patients with underlying medical conditions. These may include osteomyelitis of the facial bones and actinomycosis [8, 11, 14].

Furthermore, misdiagnosis may result in improper and unnecessary treatment, potentially exacerbating the chronicity of the lesion [3].

Patients affected by this pathology typically seek assistance from surgeons or dermatologists rather than dentists, often undergoing multiple ineffective treatments as a result [7].

In view of the potential for misdiagnosis of an extraoral subcutaneous sinus, a complete detailed history and comprehensive dental examination is paramount to eliminate an odontogenic cause [15].

Clinicians should take note of the patient's oral conditions, including caries, past dental interventions, and periodontal health. In the diagnostic process, it is essential to assess the vitality of the teeth and evaluate them for signs such as caries, fractures, and discoloration.

Pulp sensitivity tests and radiographic analysis are the standard tests used to identify the affected teeth [16].

The use of gutta-percha points in radiographic tracking of sinus tracts helps to achieve the correct final diagnosis. However, this diagnostic technique has several limitations, such as the risk of tissue damage, patient discomfort, and operator fatigue [17].

Cone-beam computed tomography (CBCT) is the preferred imaging method for assessing the size and extent of bone destruction and identifying the affected tooth in cases of cutaneous sinus tracts [9, 18].

CBCT imaging offers a number of advantages in the detection of apical periodontitis and bone lesions, as well as the prediction of aberrant root canals and the evaluation of root canal preparation and obturation [5].

Our initial clinical case demonstrated the ability of CBCT imaging to accurately assess the size and extent of bone destruction, as well as identify the presence of a second canal. In certain instances, CBCT imaging has the potential to uncover periapical radiodensity anomalies that may not be evident on panoramic and periapical radiography [13].

Root canal therapy is the treatment of choice in cases of cutaneous sinus tract of endodontic origin and should always be attempted first. The successful outcome of endodontic therapy is largely dependent on the elimination of microorganisms within the root canal system. Hypochlorite allows for organic debris removal while chlorhexidine shows substantivity and action even against Enterococcus. In addition, calcium hydroxide is strongly alkaline and is popularly used to raise the intracanal pH killing most of the intracanal microbes [6]. In our second clinical case, endodontic medication with calcium hydroxide was used for 2 weeks.

In case of nonrestorable teeth, extraction is the solution [9].

Systemic antibiotics are not recommended for the management of odontogenic cutaneous sinus tracts as they provide a pathway for drainage, preventing swelling and pain. Consequently, the draining sinus tract maintains a localised condition and prevents any systemic involvement [19]. For this reason, in these clinical cases, no antibiotics were prescribed.

The sinus tract will resolve typically within 2 weeks [18]. The formation of scar tissue post-healing may necessitate cosmetic skin treatments for aesthetic purposes, particularly if the healed area of the sinus tract causes skin retraction or dimpling [4].

Conclusion

Cutaneous sinus tracts of dental origin are often misdiagnosed and inappropriately treated. With proper diagnosis and treatment, predictable and rapid healing of these lesions is achieved. CBCT imaging is a noninvasive assistant diagnostic tool for the diagnosis of the odontogenic origin of extraoral sinus tract. Root canal therapy represents the treatment of choice for such clinical cases and should be considered as the first approach.

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