Case report

Non-invasive management of extra-oral sinus with Radix-Entomolaris: A case report

ABSTRACT:

Endodontic failure is likely to occur due to inappropriate mechanical debridement, persistence of bacteria in the canals, poor obturation quality, over and under extension of the root canal filling and coronal leakage are some of the attributed causes. Clinically, the extraoral sinus tract of endodontic origin is confused with the cutaneous origin and sometimes it may get misdiagnosed. For this reason, a dental cause must be considered for any cutaneous sinus tract involving the face or neck. This case report describes the non-invasive management of extra-oral sinus tract of odontogenic origin which was a cause of long-standing endodontic failure using a non-surgical approach.

KEYWORD: Extra-oral sinus tract, non-surgical endodontic management, radix entomolaris, calcium hydroxide dressing, triple antibiotic paste

INTRODUCTION:

The primary goal of endodontic treatment is the correct diagnosis, optimal mechanical & chemical preparation and three-dimensional obturation of the root canal space.[1] Main purpose of root canal treatment is to fill up or block all root canals and to form a fluid-tight seal on the apical foramen of the tooth, so as to avoid peri-radicular tissue leakage and chances of secondary infection.[2] Main factor associated with endodontic failure is the persistence of microbial infection in the root canal system and /or peri-radicular region. So, a tight hermetic seal is essential to prevent bacteria and their by-products from invading the apex.[3] However, persistent microleakage which remains unnoticed or asymptomatic might leads to disease

progression to periodontal lesions such as apical periodontitis—periapical abscess or sinus tract leading to fistula.

Term Sinus Tract "refers to a tract leading from an enclosed area of inflammation to an epithelial surface" Odontogenic cutaneous sinus tracts are unusual dermatoses that occur because of chronic dental draining infections, especially apical periodontitis.[4] The most effective treatment for sinus discharge is root canal treatment, which eliminates the infection source. In the case of a non-vital tooth, non-surgical care should always be the first option, and bacterial eradication is the key to infection recovery.[5]

This case report presents an odontogenic cutaneous sinus tract that originated due to inadequate coronal seal and its non-surgical management.

CASE REPORT

A 13-year-old female patient was reported to the department with chief complaint of pus drainage on the left lower jaw. History of presenting illness reveals that the patient had pus discharge since 3 month ago, it started as small swelling with mild discomfort in the left lower jaw. Soon after, it developed into a skin lesion along with drainage which was alternatively appearing and disappearing.The patient has taken over-the-counter medication after which the sinus tract did not subside.

On extra-oral, examination, gross facial asymmetry was noted due to swelling on the left side of the cheek region with ill-defined margins. A well-defined ulceration/scar was noticed 1 cm below the inferior border of the mandible measuring 2×3 cm (oval in shape) in diameter. There was local rise in temperature was noted. On

palpation, the nodule was soft, tender and elicitated a purulent discharge from it. (figure 1)

On intra-oral examination, there was temporary restoration left on the walls in relation to 36. On percussion, teeth was tender. On radiographic examination, it was found that there was evidence of previous root canal treatment done and the presence of distolingual root suggestive of radix entomolaris. It reveals ill-defined radiolucency involving the disto-lingual root in the apical region (Figure 2). For the diagnostic purpose, sinus tract tracing was done with a gutta-percha which was inserted until the resistance was felt. The cone extent till the distal lingual root of 36, thus confirming sinus was related to disto-lingual 36. Based on the history and clinical examination a provisional diagnosis of dentoalveolar abscess with extraoral sinus in radix - entomolaris.

The treatment plan was initiated for re-root canal treatment with removal of the previous gutta-percha using an H-file. The working length was determined and using the radiographic method. The canal was cleaned and shaped. Copious irrigation with sodium hypochlorite followed by saline irrigation. Initially, a triple antibiotic paste was prepared using ciprofloxacin (500mg), metronidazole (400mg) and minocycline (100mg) were mixed with saline media and placed in the root canal. Following after 1 week, calcium hydroxide dressing was given for 4 weeks. The resolution of the sinus tract after dressing in about one month was noted. (Figure 3,4)

Subsequently, the root canal was obturated with Gutta-percha using a single cone condensation technique with a Zinc oxide eugenol sealer and the access cavity was sealed with a temporary restoration. The next day tooth was restored using a preformed stainless-steel crown. After 6 months of the placement of the stainless steel,

crown-appreciated satisfactory healing was noted with an increase in radiopacity at the periapical region. (Figure 5,6)

DISCUSSION

A chronic dentoalveolar abscess is a chronic infection of the peri-radicular tissue caused by acute pulpitis, acute non-suppurative periodontitis, or acute exacerbation of periapical granuloma, cyst, or abscess.[6] Depending on the direction of the inflammation, which is governed by surrounding muscular attachment and facial planes, an intra-oral or extra-oral sinus develops. The teeth apices located below the muscle attachment of the mandible and above in case of maxilla cause the spread of infection extra-orally. The odontogenic infection spread from the apex of the tooth into the surrounding bone, then laterally or medially along the path of least resistance.[7]Dental sinuses are frequently located near to the tooth that is causing the problem. Kaban et al, noted that sinus tracts occurred more frequently in the mandibular (80%) than maxillary teeth (20%).[8]

In the present case, the cause of endodontic failure was inadequate coronal seal Magura et al. evaluated the coronal leakage of human saliva in endodontically treated teeth. They reported that saliva penetration at 90 days was significantly greater than seen at 2, 7, 14, and 28 days. This study recommended that obturated root canals that have been exposed to the oral environment for longer than three months should retreat before placement of a permanent coronal restoration.[9]

Bender et al. suggested that these sinus tracts were originally thought to be lined by epithelium and therefore require surgical intervention apart from the endodontic treatment. But later, studies suggested that it was lined by granulation tissue and not epithelium so that it can be treated by non-surgical treatment. [10] So, the choice of treatment in the present case report was a non-surgical intervention

Conservative non-surgical root canal treatment is suggested as the first choice of treatment if the offending tooth is restorable. Management of infection-caused periapical lesion is a two-step process: Firstly, antibacterial treatment via antibiotics and then chemical irrigation and disinfectants (calcium hydroxide).[11] In our case, calcium hydroxide-iodoform–silicone oil paste was used (METAPEX) for intracanal medicament placement was given. The sinus tract healed in about 30 days. Satisfactory healing of the extraoral sinus was observed with minimal scar formation. These products are used as a temporary filling material after pulpectomy and it has shown excellent antibacterial and bacteriostatic properties. Its high pH neutralized the endotoxins produced by anaerobes and the H+ ion enhances the tissue enzyme activity such as alkaline phosphate and silicone oil—lubricant which ensure complete coating of canal walls and solubilize calcium hydroxide remain active in the root canal which promotes a favorable environment for osseous repair.[11,12]

Lesion sterilization and tissue repair refer to the use of a combination of antibiotics locally to promote healing of the pulp, peri-radicular tissue and bone. As a results combination of antibiotics was used, this approach may help reduce the chances of even resistant microbes surviving. It helps in promoting the regeneration of lost tissue by delivering antimicrobials to the sites of infection and thus acts as a synergistic effect. Metronidazole was chosen as the first-line treatment because it is selectively toxic to anaerobic microorganisms and can penetrate deep into dentin. Ciprofloxacin has a high antibacterial activity against Gram-negative bacteria but a low antibacterial activity against gram-positive bacteria.[13]

Many methods have been propagated, for the treatment of such lesions such as peri-apically perforating the root of the tooth during root canal treatment thus draining the pus through an orthograde approach to creating an extraoral pathway.

Furthermore, when standard treatment fails, more invasive treatment is required, which might result in tooth structural loss and bone grafts. Orthograde root canal therapy is becoming the norm, with surgical revision reserved only for non-healing cases.

CONCLUSION

Proper diagnosis is the basic requirement for the successful management of the odontogenic cutaneous sinus tracts of pulpal origin as it causes the cutaneous sinus tract to re-occur when the dental etiology is not addressed. A clinician should always have sound knowledge of anatomic variations as well as internal morphology. The possibility of extra roots should be considered to avoid confusion during the negotiation of the canals. The 3-D analysis serves a better picture for analysis and should be considered. The main aim should be to attain a coronal and hermetic seal with full crown restoration after endodontic treatment. The case with endodontic failure should be diagnosed first with non-surgical intervention and should be considered as the first line of treatment.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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Figure 1: Pre-operative view of the draining sinus

Figure 2: pre-operative radiograph of 36 with periapical radiolucency

Figure 3: 1-month follow-up after Calcium hydroxide dressing

Figure 4: 1-month follow-up after calcium hydroxide dressing

Figure 5: Complete healing of the lesion with minimal scar after 6 months of follow-up

Figure 6: Post -operative radiograph after 6 months follow-up