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ENDODONTIC MANAGEMENT OF EXTRAORAL SINUS TRACT WITH DIODE LASER AND PROPOLIS.

Dental Science

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ABSTRACT

Clinically extraoral sinus tract may be confused with many other clinical conditions. Proper diagnosis and management of odontogenic cutaneous tract is of paramount importance. This case report presents a case of a twenty year old girl reporting to the department with cutaneous sinus tract in the chin region. Management of odontogenic cutaneous tract was done by endodontic therapy. In this case, laser and propolis were used for intracanal disinfection showing promising results.

KEYWORDS

Odontogenic Cutaneous Sinus Tract, Propolis, Laser

Introduction:

The sinus tract is defined as a channel leading from an enclosed area of inflammation to an epithelial surface.[1] The odontogenic tract may open intraorally or extraorally. The site of a sinus tract depends on the location of the perforation in the cortical plate and its relationship to facial-muscle attachments.[2] Extraorally common locations are cheek, chin and angle of the mandible.[1] The most common cause of a cutaneous sinus tract is a chronic periradicular abscess.[3] Odontogenic cutaneous sinus tract may be confused with traumatic lesions, foreign body lesions, squamous cell carcinoma, congenital fistula, salivary gland fistula etc. [2] Hence early diagnosis is essential to achieve early healing and prevent unnecessary treatment. Initially it was thought that these sinus tracts are lined with epithelium but Bender & Seltzer (1961) and Grossman (1981) reported that such tracts are generally lined with granulation tissue.[4] If not treated properly this leads to cutaneous scarring and dimpling adversely affecting the facial aesthetics. Proper root canal treatment of the responsible teeth leads to resolution of the sinus tract in most of the cases. This requires thorough mechanical and chemical disinfection of the root canal with the help of irrigants and intracanal medicaments.

Apart from traditional phenol based disinfectants and calcium hydroxide, nowadays, laser and natural products like propolis have also been used for intracanal disinfection with satisfactory results. Considering the shortcomings of calcium hydroxide in eradication of E. faecalis newer materials has been under research. Propolis is a byproduct of honey bee having antibacterial ,antifungal and antiviral properties, promotes cartilaginous and bone tissue regeneration, and possesses anesthetic and immunomodulatory properties.[5]

Laser systems have gained widespread acceptance in endodontic therapy because of their effectiveness in cleaning and disinfecting the root canal lumen. In the present case conventional root canal therapy combined with gallium- aluminum- arsenide diode laser (GaAlAs) disinfection and propolis as an intracanal medicament lead to complete healing of the extraoral cutaneous sinus tract.

Case Report

A twenty year old female patient reported to the department with a chief complaint of pus discharge & draining sinus through chin region extraorally. Patient was having this problem since 6 months. Initially she had pain in lower anterior tooth region but the pain subsided after taking medicine. Then she developed sinus tract in chin region extraorally. She visited local doctor who prescribed antibiotics for the same but the problem did not resolve. Then she was referred to a dermatologist who also treated her for one month but the problem continued. Finally she was referred to our department.

Figure.1: Clinical pictures: (A) Preoperative photograph showing extraoral sinus tract. (B) photograph at second visit (C) 6 months follow up showing complete resolution of the lesion.

On clinical examination extraoral sinus tract was seen in the chin region. On palpation, a thumb-tip-sized nodal swelling around the fistula was found (Fig.1 A). Intraoral clinical examination showed discolored 31, 32 & 41. Slight tenderness on percussion was present with 31 and 32. Radiographic examination showed periapical radiolucency with 31, 32 & 41 (Fig.2 A). On electric pulp vitality testing no response was seen with 31, 32 & 41.

Sinus tracing showed association of the sinus tract with 31 & 32. The diagnosis of chronic periapical abscess with an extraoral sinus tract was established. The treatment plan decided was root canal treatment with 31, 32 & 41.

Access opening was done with round bur and endo access bur. Biomechanical preparation was performed by hybrid instrumentation technique using hand K files (Mani Inc) and Protaper (Dentsply Maillefer, Ballaigues, Switzerland) rotary files. Irrigation was done with 5% sodium hypochlorite followed by 17 % liquid EDTA (Canalarge, Ammdent; Amrit Chemicals and Minerals Agency, Mohali, Punjab, India). Agitation of the irrigant was done with endoactivator. Later on laser was used for intracanal disinfection following which propolis (Hitech India Naturals Limited) was placed as an intracanal medicament for 2 weeks. No systemic antibiotics were given to the patient.

Intracanal irradiation was performed using 980 nm GaAlAs Diode Laser (Denlase-980/7, China Daheng Group, Inc.) with a 200 micrometer fiberoptic tip and set at a power of 2.5 W. Using an oscillatory technique, the diode fiber was introduced 1 mm short of the apex and recessed in helicoidal movements at a speed of approximately 1 mm/s, and repeated four times at intervals of 10 s between each one.[6]

After 2 weeks when the patient came for second visit there was significant healing seen in that area with no pus discharge (Fig.1 B). Also the teeth have become asymptomatic now. The intracanal medicament was removed and obturation was done by warm vertical compaction technique (E and Q Plus system; Meta Biomed Inc, Chalfont, PA) (Fig.2 B). The patient was kept under follow up. Six months follow up radiograph shows good periapical healing (Fig.2 C). Clinically healed sinus was seen with scar formation (Fig.1 C). Cosmetic surgical treatment was advised to the patient for the same.

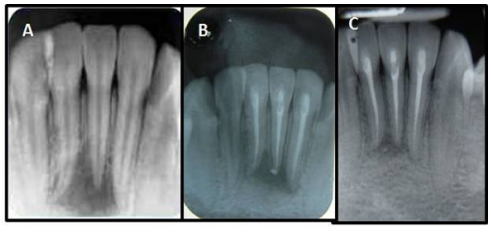

Figure 2. Intraoral Radiographs: (A) Preoperative ; (B) Immediate Postoperative ; (C) 6-Months Recall.

Discussion:

Diagnosis of odontogenic cutaneous tract by differentiation from other similar conditions is important. Odontogenic cutaneous tract develops due to pulp necrosis & periapical abscess. It may be confused with various other conditions like squamous cell carcinoma, fungal & bacterial infections, congenital fistulas etc. Sinus tracing helps us to confirm the diagnosis and the offending tooth. Initially it was said that removal of the sinus tract is essential for treatment, but proper endodontic treatment is the only thing needed. Here also the patient received only non surgical root canal treatment with satisfactory results.

The success of endodontic therapy depends on complete eradication of microbes from the root canal system. However only mechanical instrumentation and conventional irrigants or medicaments may not be able to reach all the areas of the root canal system. Calcium hydroxide is unable to eradicate some bacterial species like *Enterococcus (E.) faecalis*, the main microorganism found in root canal therapy failures. Hence newer materials have been tried to overcome the shortcomings. Of the newly found medications, propolis has attracted attention as a natural antimicrobial agent. Propolis is a byproduct of honeybees having antibacterial, antiviral, and antifungal properties.[7] Propolis has significant efficacy in killing E. Faecalis.[7] Also propolis is 10 times less potent as a cytotoxic agent than Calcium hydroxide. It is also much less cytotoxic to the periapical tisssues as compared to calcium hydroxide.[5]

Lasers have been shown to effectively sterilize the root canal. Laser treatment may effectively replace conventional techniques because of its improved disinfection efficacy, better penetrability, more effective root canal cleaning, and elimination of the need to use toxic solvents.[8]GaAlAs -gallium aluminum arsenide allows for greater absorption by water in dental tissues and results in greater laser light penetration through dentin making it possible to act on microorganisms present in the dentinal tubules. Diode laser irradiation has a depth of penetration up to 1,000 micrometer into dentinal tubules when compared to the penetration power of chemical disinfectants, which is limited to 100 micrometer.[6]

Systemic antibiotic therapy is not needed for the healing of the tract. It results only in the temporary resolution of the symptoms. [1, 9] Six months later, the cutaneous lesion had completely healed with a linear scar formation. Unlike intraoral sinus tracts, extraoral tracts will heal with granulation tissue thus leaving a cutaneous scar. Therefore, the patient needs to be advised of a possible surgical revision of the scar. Usually, the surgical revision is uneventful and enhances cosmetic result.[1]

Conclusion:

The present case shows that dental etiology should always be considered in cases of odontogenic cutaneous tract to prevent unnecessary treatments. In this case conventional root canal therapy combined with laser disinfection and propolis as an intracanal medicament lead to complete healing of the extraoral cutaneous sinus tract.

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