

Non-surgical management of endodontic infection with an extra-oral sinus in mandibular left second molar 3 month follow up: A case report

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Abstract : A case report on non-surgical management of extra oral sinus in the lower left mandibular second molar, managed using calcium hydroxide in multiple sitting. Calcium hydroxide is the most commonly used, and studied root canal medication. Nonsurgical endodontic therapy was performed and successfully treated the sinus tract with minimal scar formation and complete healing was observed by the first month of the treatment.

Keywords : Multiple sitting, Non-surgical healing, extra oral sinus, calcium hydroxide (10 Italic)

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I. Introduction

The sinus tract is defined as a channel leading from an enclosed area of inflammation to an epithelial surface. The opening of the sinus tract can be located either intraorally or extra orally(1). Most commonly, the etiology of odontogenic sinus tracts involves a chronic periradicular abscess(3,4). Slutzky – Goldberg et al found chronic periapical abscess as the most prevalent diagnosed cause for the origin and existence of the sinus (71.0%) followed by broken restoration 53.0% and the most frequent site of orifice was buccal 82.4% followed by lingual or palatal 12% (4). The sinus tract occurs more frequently from periapical lesions caused by mandibular teeth 80 % than from those caused by maxillary teeth 20%, & this is predominantly the appearance of cutaneous sinus tract of dental origin in the submental & submandibular regions.(2,5). Studies revealed that extra-oral sinus tracts are most commonly found on the cheek, chin & angle of the mandible(4, 6,7). The vicinity of lesions does not always arise from the infected tooth and have been commonly reported on the chin or jaw line as it follows the path of least resistance (8,9). These abscess arises from bacterial invasion, chemical irritation or trauma. These cutaneous lesions usually arise as sequel of bacterial invasion of dental pulp through a rupture by trauma or carious defect (10). Microorganisms along with their by-products present in the necrotic and infected pulp spread beyond the confines of the tooth into the periradicular area, might perforate the cortical plate through inflammatory and immunological processes with the infection draining onto the intraoral mucosa or cutaneous surface resulting in scarring or pimple of skin (11).

II. Case report

A 19 years old patient reported to the department of conservative dentistry & endodontics, Sree balaji dental college and hospital with the chief complaint of pain & swelling in the lower left back tooth region. History revealed that the patient had pain on the lower left back tooth region which was intermittent & which aggravated on chewing food for the past 2 month, history also revealed that patient had symptoms of fever which subsided after medication. Patient also presented with a history that the swelling on face started only 5 days ago. No relevant medical history was found. On extra oral examination revealed a diffuse swelling in the left side of the face near the submandibular region which measure approximately 0.5 X 1 cm in size(Fig.2). The skin around the swelling was erythematous. On palpation the swelling was tender, firm in consistency with pus discharge. The patient revealed that the lesion appears and disappears alternatively for the past 2 month.



Fig 1: Extra-oral sinus

Intraorally, there was a carious lesion in the left mandibular second molar and restoration in left mandibular first molar. Mild swelling was present on the alveolar mucosa in relation to 37, 38 region, with mild obliteration of the buccal mucosa (Fig2). The tooth was not tender on percussion and it did not respond to heat and electric pulp testing. On radiographic examination, revealed that there was an evidence of dental caries which involved the pulp in the region of 37 along with an ill-defined periapical radiolucency surrounding the apical area of 37, it also revealed loss of lamina dura & widening of periodontal ligament (Fig.3). It was provisionally diagnosed as apical periodontitis leading to periapical abscess with extra oral sinus in mandibular left second molar.



Fig 2:Intra-oral image



Fig 3: Pre-operative radiograph

An endodontic treatment was initiated, access opening was done in 37 using endo access bur after placing the rubber dam canal orifice were located using DG16. The canals were enlarged with GG size #1, #2 & #3, then with K-File #10 followed by #15 the glide path was obtained. Open dressing was given as pus was oozing out of the canal. Patient was asked report next day. Working length was determined using ROOT ZX mini, working length 22.5mm for distolingual and distobuccal canal, 22mm for mesiobuccal & mesiolingual canal. Cleaning & shaping were done using Protaper Universal till size F2 & irrigation was done by chlorhexidine followed by final irrigation using saline. Calcium hydroxide was placed & radiograph was taken (Fig.4). On the second visit it was clinically visible that the extra oral sinus & the intraoral sinus subsided. The canals were opened irrigated & dried with paper point. Master cone size F2 was placed in all the canals in 37 (Fig.5). IOPA was taken & obturation was done using AH Plus sealer and radiograph was taken (Fig.6).



Fig 4: IOPA after CaOH



Fig 5: Master cone radiograph



Fig 6: Obturation radiograph



Fig 7: Extra oral image after two weeks



Fig 8: Obturation radiograph after 1 month



Fig 9: Review after 1 month



Fig 10: Review after 3 months

III. Discussion

Due to irreversible pulpitis, the pulp gets necrotic and its environment becomes suitable for the microorganism to multiply and release various toxins into periapical tissues and which in turn leads to periapical abscess in bony trabeculae of jaw. But when purulent exudate increases it starts penetrating cortical plate and sinus tract starts developing towards least resistant area(8,9) . A cutaneous sinus may develop as early as a few weeks (12,13) or as late as 30 years (14,12). According to Hodges TP, Cohen DA et al 1989 reported that approximately 80% of cases are associated with mandibular teeth and 20% with maxillary teeth. The most common areas of involvement are the chin and submental regions (16,15). Other sites of drainage are the cheek, canine space, nasolabial fold, nose, upper lip, and inner canthus of the eye (16,15,14). According to Thoma KH et al in 1963 & Harrison J W et al in 1976, stated that cases with sinus tract requires a surgical intervention apart from endodontic treatment, because the sinus tract were originally thought to be lined by epithelium. But, later in 1981 Grossman et al, suggested that it was lined by granulation tissue & not epithelium, which directed to the non-surgical endodontic treatment may the sinus be present extra oral or intra-oral. One-step treatment has many potential advantages as it is less expensive, very well accepted by patients, and has been shown to result in a lower flare-up rate (17,18).It has been shown that instrumentation and irrigation alone decrease the number of bacteria in the canal 1000-fold (19). But, the canals cannot be rendered free of bacteria by instrumentation and irrigation alone. It has been hypothesised that the low number of bacteria left in the canal is below the threshold to sustain the inflammation periapically or are entombed and killed due to lack of space and nutrition after effective obturation of the space in the canal (20). Hence, some authors have assumed that the additional disinfecting action of calcium hydroxide would not result in discernibly superior results. However, according Martin Trope et al in 1999, in his study the additional disinfecting action of calcium hydroxide before obturation resulted in a 10% increase in healing rates (20). Considering this difference as clinically important multiple visit treatment was done. Calcium hydroxide is the most commonly used, and studied root canal medication. The first report about calcium hydroxide is attributed to Nygren (1838) for the treatment of the “fistula dentalis”. The high alkaline environment produced by hydroxyl ions of the calcium hydroxide becomes the catalyst for rapid destruction of structural lipids and lipoproteins present inside the bacterial cells. The antimicrobial effect of calcium hydroxide relate directly to its high alkanity (pH 12.5), it has a destructive effect on cell membranes & protein structures (21).Calcium hydroxide is the preferred intracanal medicament due to its beneficial effects. Usage of calcium hydroxide paste was advocated for rapid and successful treatment of sinus tracts associated with necrotic teeth (1).Sahli et al in 1988, proposed that the necrotizing ability of calcium hydroxide may destroy any epithelium present thereby allowing a connective tissue invagination into the lesion with ultimate healing(22).

IV. Conclusion

Nonsurgical endodontic therapy was performed and successfully treated the sinus tract with minimal scar formation. Cutaneous sinus, a tract of dental origin, though uncommon, but is a well-documented condition that usually requires dental treatment. Early diagnosis and prompt treatment minimize patient discomfort and esthetic problems, reducing the possibility of further complications such as sepsis and osteomyelitis .Dental infection should be considered a primary cause of cutaneous facial sinus tracts. In cases with restorable teeth,

elimination of the infection through endodontic treatment should be considered which will leads to resolution of the sinus tract as in the case presented here.

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