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Non-Surgical healing of large periapical cyst : A Case report

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Abstract

Pulpal necrosis is a frequent sequel of trauma and if microbial infection occurs, this will result in the development of a periapical lesion. The ultimate goal of endodontic therapy is to return the involved teeth to a state of health and function without surgical intervention. All inflammatory periapical lesions should be initially treated with conservative nonsurgical procedures. Healing of large cysts like well- defined radiolucency's following conservative root canal treatment has been reported. Hence a nonsurgical approach should always be adopted before resorting to surgery. This is a case report describing conservative non-surgical management of large peri-apical lesion. A 24-month follow-up radiographic examination revealed progressive involution of periapical radiolucency without any clinical symptoms.

Keywords: Non-surgical healing, Periapical cyst, Triple antibiotic paste.

Introduction

Periapical lesions develop as a sequela to pulpal disease. Bacterial infection of the dental pulp may lead to

periapical lesions.[1] They are generally diagnosed either during routine dental radiographic examination or following acute pain in a tooth.[2] Most periapical lesions (>90%) can be classified as dental granulomas, radicular cysts or abscesses.[3&4] The incidence of cysts within periapical lesions varies between 6 and 55%.[5] The occurrence of periapical granulomas ranges between 9.3 and 87.1%, and of abscesses between 28.7 and 70.07%.[6]

Studies indicate that conventional root canal treatment leads to the radiographic disappearance of 85% to 90% of apical radiolucencies or to a marked reduction in the size.[7&8] All inflammatory periapical lesions should be initially treated with conservative procedures.[9] Large periapical lesions and apical true cysts are of inflammatory origin can be treated initially with a nonsurgical approach.[10] When intra- or extra-radicular infections are persistent, and periapical pathology fails to resolve after nonsurgical endodontic management protocols, only then a surgical option should be considered.[11]

Case report

A 27-year-old female patient reported to the department of conservative dentistry and endodontics with a chief complaint of intra oral swelling in the maxillary anterior region. Her medical history was not contributory. History revealed trauma 5 years back due to fall.

On clinical examination showed a diffuse palatal swelling from approximately 2 months from the day of presentation with gradual increase in size. Swelling extended from the upper left central incisor to the mesial aspect of second premolar in upper right quadrant. Palpation of the anterior palatal region revealed a soft-fluctuating swelling, egg-shell crackling could be elicited with no pain, which indicated a loss of integrity of palatal bone. Buccally there was no associated swelling and no sinus tract seen. Hard tissue examination revealed an Ellis Class II fracture in relation to 11 and 21 and 11,12,13,14,21,22 were mild sensitive to percussion and palpation. Grade I mobility was identified in tooth #11 with tenderness on palpation in adjacent mucosa. Thermal and electrical vitality tests were performed for 11,12,13,14,15,21,22 which did not elicit responses. Radiographic examination revealed a large well defined periapical radiolucency at the root apex with loss of lamina dura with corticated border involving 11,12,13,14 and separate radiolucency was noticed for 21,22 with well-defined cortical border (Figure 1) and the condition is diagnosed as periapical cyst involving 11,12,13,14,15,21,22.

Various treatment options were explained to the patient as (i) conservative endodontic management ensuring the complete removal of causative organisms, and regular radiographic follow-up to evaluate healing and monitor potential lesion enlargement, and (ii) conservative endodontic management followed by periapical surgical approach by enucleation and curettage. They opted for nonsurgical endodontic treatment and informed consent was taken.

Conservative nonsurgical management was planned and root canal therapy initiated on 11,12,13,14,15,21,22 under rubber dam and local anesthesia. A suppurative yellowish fluid was drained through the cavity after a sufficient access preparation. A cytological examination of sample collected verified presence of cholesterol crystals compatible with radicular cyst. When drainage ceased, canals were identified, and the working length is determined using 15k file (Dentsply, Maillefer, Ballaigues, Switzerland) by confirmation with a periapical radiograph. Canals were instrumented using a step-back technique. After establishment of a glide path, the biomechanical preparation was done using protaper

rotary instruments (21 mm - S1, S2, F1, F2, F3 - Dentsply Maillefer, Ballaigues, Switzerland).

During instrumentation, the canals were irrigated copiously with 2.5% naocl solution (Nice chemicals Pvt Ltd., India) using a 28-gauge endodontic side vent needle after each instrument followed by normal saline (Nirlife Health Care, Nirma Products, India). The canal were dried with sterile paper points. Triple antibiotic paste used as an intracanal medicament is loaded into the canals using a lentulo spiral. The intracanal dressing was changed weekly for 8 weeks and the tooth remained asymptomatic. The patient was scheduled 2 weeks later for obturation. All the teeth were then obturated with gutta percha and Bioceramic sealer using single cone technique. Patient remained asymptomatic during post operative recalls. Radiographic examination after six months, revealed that the radiolucent area had reduced in size and that trabecular bone was continuing to develop. Clinical examination showed no sensitivity to percussion or palpation and the soft tissues were healthy. A 12-month follow up revealed adequate healing with formation of trabecular bone. The 24-month review showed a significant amount of healing with resolution of the periapical lesion (Figure 2).

Discussion

Periapical cysts are entitled to inflammatory jaw cysts at the apices of teeth with infected or necrotic pulps. A periapical (radicular) cyst is the most common odontogenic cyst.[5] The process of pathogenesis of a cyst begins by initiation which gradually progresses to cyst formation and then enlarges to involve the adjacent bone and other vital structures in its surrounding.[12] The majority of apical cysts are asymptomatic and are accidently discovered on a periapical radiographs as a large periapical radiolucency involving the apex of one or more teeth.

The treatment options for large periapical lesions range from conventional nonsurgical root canal therapy to surgical interventions. The advantage of performing endodontic treatment in the healing of periapical lesion aids in the removal of the infected pulpal tissue besides minimizing the bacteria inside the root canal. As several antimicrobial agents, such as sodium hypochlorite, are used in endodontics as irrigants to decontaminate and clean the endodontic space, with a broad spectrum and nonspecific killing efficiency against bacteria, spores, and viruses.[13]

Complete debridement and irrigation of the root canal was done using 2.5% naocl, followed by the application of a triple antibiotic paste (TAP) as an intracanal. Medicament. TAP was successful in promoting the healing and repair of the periapical tissue. It also decrease the development chance of the resistant bacteria strains. The use of intracanal medicament helps postoperative control, since the mechanical preparation by itself does not reach all the lateral and accessory root canal systems, or dentinal tubules.[14] It is also proved that TAP has better results in decreasing colony forming units in comparison with calcium hydroxide.[15]

With the advancement of the rotary instrumentation systems, the single cone obturation technique has been used. This technique uses master cones that best match the geometry of the nickel-titanium rotary systems. The use of these gutta-percha points does not require either accessory points or the lateral condensation when the root canal is enlarged with rotary instruments and the possibility of a faster endodontic treatment obturation.[16]

Surgical intervention is recommended only after nonsurgical techniques have failed. The events that might be associated to periapical surgical interventions are loss of bone support, possibility of damaging anatomic structures, possibility of damaging blood vessels and

nerves irritating and innervating teeth adjacent to the lesion, production of anatomic defects or scars, postoperative pain or discomfort, and refusal to undergo surgical procedures.

Endodontic therapy remains the first alternative in the treatment of periapical cysts as the elimination of the bacteria from the root canal is the most important factor for the successful treatment of periapical lesions. In a surgical procedure without endodontic therapy, the main factors responsible for the development of the lesion remain completely untouched.

Figure 1: Radiographic examination showing a large well defined periapical radiolucency at the root apex involving 11,12,13,14,21,22.

Figure 2: The 24-month follow-up showed a significant amount of healing with resolution of the periapical lesion.

Conclusion

Non-surgical endodontic treatment for periapical cysts is effective and seems to be the first line of treatment. Nevertheless, clinicians must acknowledge the fact that the cysts can persist with post-treatment apical periodontitis, and consider the surgical option, particularly when earlier attempts at orthograde treatment have not resulted in healing.

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