International Journal Dental and Medical Sciences Research
Volume 6, Issue 5, Sep - Oct 2024 pp 87-90 www.ijdmsrjournal.com ISSN: 2582-6018

Non-Surgical Management of Large Periapical Lesion – A Case Report

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Submitted: 10-09-2024 Accepted: 20-09-2024

ABSTRACT

This case report describes non-surgical management of alarge periapical cyst like lesion using calcium hydroxide as intracanal medicament. The periapical cyst like lesion occurs as the bacteria from necrotic pulp reaches the periapex. The treatment protocol varies from non-surgical management to surgical management.Small periapical lesions of endodontic origin typically heal with nonsurgical endodontic therapy. However, larger periapical lesions, persumed to be cystic, require additional treatment protocols to facilitate regression. In this case report calcium hydroxide and iodoform combination as an intracanal medicament helped in healing the large periapical cyst like lesion.Nonsurgical management of such lesions eliminates potential surgical complications and is generally well-accepted by patients.

KEY WORDS

Non-surgical endodontic therapy, periapical cyst like lesion, calcium hydroxide and iodoform combination

I. INTRODUCTION

Periapical lesion found around a tooth can be classified as granuloma, periapical cyst, or abscess(1) but the definitive diagnosis of periapical lesion can be made by histologic examination.Of all the periapical lesions the prevalence of cysts is 8.7%-37.7%(2). According to Eversole there are four criteria for clinical diagnosis of cyst such as if one or more non-vital teeth is involved or the size of the lesion is more than 200mm^2 it is considered a periapical cystic lesion, also the lesion can be seen a well circumscribed well defined radiolucent area bound by thin opaque line in radiograph and can show straw colored purulent exudate from the canal(3). Periapical cyst can be classified as periapical pocket cyst and periapical true cyst. Periapical true cysts have cavities that are completely surrounded by epithelial lining and are not directly connected to the root canal system so these kind of cysts are treated surgically in order to resolve. The periapical pocket cysts have epithelium-lined cavities that are open to the root canal of the affected tooth and they can be treated with traditional nonsurgical endodontic therapy as that will disinfect the root canal system and resolve the lesion(4)

Toller hypothesized that periapical cyst growth is related to the hydrostatic pressure of an enclosed liquid which stimulates osteoclastic activity(5). The treatment of these large apical lesions varies from non-surgical endodontic treatment to endodontic surgery. Surgical intervention should be considered if the apical lesion fails to respond to intracanal endodontic treatments. Surgical interventions procedures include periradicular curettage, apical resection along with simpler techniques such as marsupialization and tube decompression(6).

Lesions of the periapical region occurs as a result of spread of infection of dental pulp that may either occur as a consequence of dental caries, operative dental procedures or trauma. And this introduce biofilm which is mostly anaerobic bacterial flora to the periapical region leading to a periapical lesion. The primary aim of any treatment for a periapical lesion is eliminating the microbial flora and also to prevent the further spread of the infection(7). Many ways of non-surgical methods of managing a periapical lesion which mainly include root canal therapy, decompression therapy, canal sterilization with intracanal medicament, aspiration - irrigation technique, lesion sterilization and repair therapy, non-surgical decompression technique as well as apexum procedure. If the host

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Volume 6, Issue 5, Sep - Oct 2024 pp 87-90 www.ijdmsrjournal.com ISSN: 2582-6018

immune response efficient, over the years, a cystic lesion remain static, or regress its growth(8).

A broad spectrum of activity against several endodontic pathogens was shown by calcium hydroxide mixed with inert vehicles or active substances. Overcoming of persistent intracanal infection can be achieved by orthograde treatment of cyst by disinfection of canal with calcium hydroxide(9). Addition of materials like iodoform to calcium hydroxide improves the radio opacity and imparts an additional antibacterial effect.(10)

II. CASE REPORT

A 30-year-old female patient presented to the Department of Conservative Dentistry and Endodontics with a chief complaint of a pimple-like swelling in the upper front tooth region and discoloration of upper front tooth. Extra oral examination appears to be normal with no swelling or lymph node enlargement. Intraoral examination showed periapical abscess and mild discoloration of 11, full crown in relation to 21 suggestive of previously endodontically treated 21.Vitality test was done and cold test showed no response in relation to 11. Radiographic examination was done, in that a periapical lesion of size of 35*15mm was seen surrounding 11 and endodontically treated 21 with under obturation was noted (Figure 1). Retreatment of 21 was not planned since it was asymptomatic with no periapical changes. Based on the presenting signs and symptoms tooth 11 was diagnosed with pulp necrosis; chronic periapical abscess. Non-surgical management of 11 was planned as it was more conservative approach, and also continuous monitoring of the lesion at various follow up time period can be done

Fig 1: Preoperative Radiograph

The treatment plan was explained to the patient and her informed consent was obtained. In the first appointment after local anesthesia using lidocaine 2%with adrenaline 1:100000 (Lox 2%, Neon labNew Delhi) multiple teethrubber dam isolation was done (Hygienic, Coltene/ Whaledent Inc., Cuyahoga Fall, USA). Access opening was performed using endoaccess bur (DENTSPLY, DE Trey GmbH, Konstanz, Germany), the working length was determined using apex locator (Root ZX,J Morita USA,Inc.Irvine,CA) and re-confirmedby a digital periapical radiograph. Cleaning and shaping supplemented by 2.5% sodium hypochlorite along with passive ultrasonic irrigation(Ultra X, Eighteenth, Oricam, India) within the limits of working length was doneup to a step back preparation till 50 K fileof 2% taper. The canal is then filled with calcium hydroxide with iodoform combination (Neopex, Oricam, India)using a hand spreader as an antibacterial intracanaldressing (Figure 2). After 2 months the patient was recalled, the old dressing was flushed with normal saline andagain replaced with calcium hydroxide and iodoform combination. Patient was again recalled after 2 months and the canal was obturated with the help of gutta percha and AH plus sealer (Dentsply, DE Trey GmbH, Konstanz, Germany) using cold lateral condensation technique (Figure 3).

Fig 2: Canal Filled With Calcium hydroxide and Iodoform Paste

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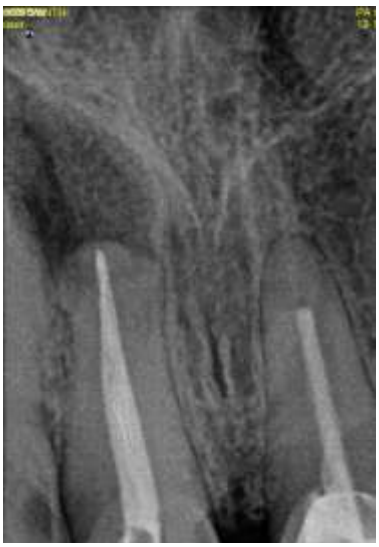

Fig 3: Immediate Postoperative Radiograph

At the one year's follow up the patient was asymptomatic, with no tenderness on percussionand the radiograph showed evidence of healing and bone formation(Figure 4). The access cavity wasrestored with compositerestoration (Tetric-N-Ceram, IvoclarVivadent).

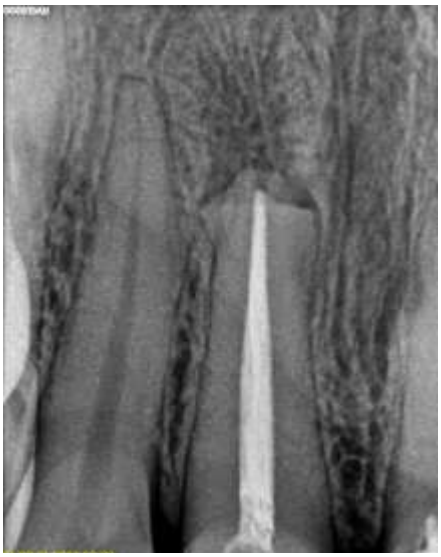

Fig 4: One Year Follow-Up Radiograph

III. DISCUSSION

Radio graphically visibleperiapica radiolucency can be periapical granuloma or periapical cyst. The sizeof periapical granulomas commonly range upto10mm and if the size is more than 10 mm it is considered as periapical cyst(11). A periapical cyst is characterized by an epithelial lining and the presence of epithelial cell rests of Malassez in the periodontal membrane(12).For the management of large periapical cystic lesions of endodontic origin several treatment modalities are available which includes nonsurgical management with or without intracanal medicament or more invasive surgical methods like decompression, periradicular cyst enucleation or marsupialization. The clinician should always weigh the benefits and risk factors of all treatments prior to the procedure.The main objective of nonsurgical root canal therapy is elimination of bacteria and bacterial contents from the root canal system and promote healing. Even though with cleaning shaping and irrigation we can't attain optimal sterilization. Sen et al suggested that in case of persistent periapical lesion the microbes can penetrate up to 10 to 15 µm into the canals(13) so additional inter appointment antibacterial dressing should be provided(14).In the present case report, the large periapical cyst like lesion were successfully treated using endodontic treatment and calcium hydroxide and iodoform combination as an intracanal medicament between the appointments.

According to literature within 2 years of treatment most of all thr large periapical cyst like lesions resolve by the disinfection of the root canal. In this case we used calcium hydroxide and iodoform combination which is a non-hardening oil based calcium hydroxide dressing. The pH of calcium hydroxide is so high that it is effective in killing Enterococcusfaecalis(15). Also calcium hydroxide promotes calcific tissue formation (16)and also dissolves remnants of pulp in the canal with its ability to denature protein(17).Since it is an oil based intracanal dressing its efficacy is increased and is said to have a destructive effect on the cell membranes and protein structures of the microbes residing in the canal as well as the periapical area(18).Iodoform in the combination has a long-term antibacterial effect along with a weak anesthetic effect. It has the ability to dry exudate from the lesion and also helps in controlling the bleeding.Presence of iodine also improves the radio opacity of the intracanal medicament(19).

Opting of nonsurgical management impose less mental and psychological trauma to thepatientas the removal of causative factor direct toward healing of the lesion due to the regenerative potential of periapical tissue this technique also allows frequent monitoring of the healing and bone formation

IV. CONCLUSION

Even though nonsurgical management of large periapical cyst like lesion is time consuming

it should always be the first choice of treatment. This technique causes less mental and psychological distress to the patient compared to surgical management. With the help of antimicrobials like calcium hydroxide and iodoform as an intracanal medicament, the causative factor can be removed canal disinfection can be done alsomonitoredperiapical healing and bone formation can be achieved.

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