

Non Surgical Healing of Periapical Lesions an Alternative to Surgery: Case Series

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Abstract: Most periapical diseases are induced as a result of direct or indirect involvement of oral bacteria. The etiologic factors are oral contaminants through the root canal or degenerating pulpal tissues. Pulpal tissue necrosis transforms the pulpal chamber into an unprotected environment. Periapical lesions are formed as result of immunologic host response to bacteria or its products. The case report present a biologic rationale for the non surgical endodontic management of large periapical pathosis. In relation to mandibular right first and second premolar, during the conservative root canal treatment, aspiration was done, followed by placement of calcium hydroxide, in which endodontic treatment was finally carried out, Complete periapical healing was observed. So In this case root canal treatment proved successful in promoting the healing of periapical lesions and it is not always necessary to do surgical treatment. This confirms that periapical lesions can respond favorably to non-surgical treatment and as a first option allows us to avoid the trauma of surgery.

Keywords: Endodontic treatment, Calcium hydroxide, Non-surgical treatment, Periapical lesions

1. Introduction

Periapical lesions are initiated by an inflammatory response at the root apex of teeth with non-vital pulps.¹ Bacterial infection may lead to periapical lesions.² Periapical radiolucent areas are generally diagnosed either during routine dental radiographic examination or following acute toothache.³

Most periradicular lesions (>90%) can be classified as dental granulomas, radicular cysts or abscesses.⁴ The formation of periapical lesions is not fully understood, though is accepted that pulp necrosis produces an ideal environment for the growth of microorganisms which in turn release toxins into the periapical tissues, inducing an inflammatory reaction and thus the Immunopathological formation of periapical lesion.⁵ mechanisms and genetic susceptibility may also play a role in the development of periapical lesions.⁶ The ultimate goal of endodontic therapy should be to return the involved teeth to a state of health and function without surgical intervention.⁷

Advancements of scientific knowledge on the genesis, pathologic nature and clinical behavior of periapical lesions and their successful treatment in various clinical trials have started favoring non-surgical approach.⁸ Observed in this case that periapical lesion have the potential for healing without surgical intervention.

2. Case Report 1

26-years old male patient was reported to the Department of Conservative Dentistry and Endodontics, in our college with a chief complaint of pain and swelling in mandibular left back tooth region since one week. On examination, there was a pus discharge i.r.t. 34, 35.



Preoperative Swelling & Pus Discharge

Radiographic Examination & Treatment Planning

RVG recorded during the diagnostic assessment showed signs of large periapical lesion i.r.t 34, 35. Root canal treatment was done before 2 years. The patient was informed about the need to have the non-surgical endodontic re-treatment and followup.



Preoperative RVG

Treatment Procedure

An access opening was done with round bur, there was drainage of yellow straw-coloured fluid from tooth 34 & 35. The gutta purcha was removed by H file. The root canal space was negotiated. The apical foramen was gauged using hand K- files and cleaning and shaping of the root canals

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was done. 2% Chlorhexidine and normal saline was used as root canal irrigants. there was purulent discharge from the canal.

A 24-gauge needle was attached to a 5-mL syringe and was inserted in to the root canal a yellow straw coloured fluid was aspirated whilst simultaneous digital pressure was applied on the swelling i.r.t 44 & 45. The swelling decreased in size completely. once the fluid evacuation was complete the swelling decreased in size completely.



Gutta Purcha Removed



Working Length



Metapex Placed

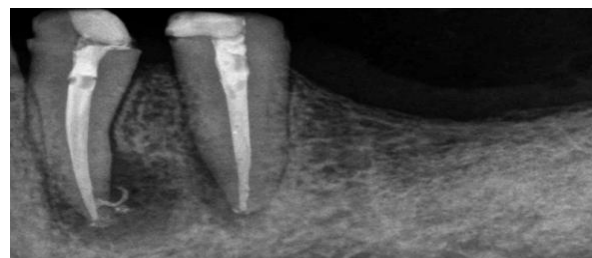
The canal was then irrigated with 2% chlorhexidine solution and the canal was dried with paper points, Ca(OH)₂ with iodoform was placed as intra canal medicament. Access cavity was restored with temporary cement (irm) Patient was recalled after 2 week.

During the recall visit patient was asymptomatic and there was no discharge from the canal. At the next appointment, Cleaning and shaping of the canal was completed, irrigating

and drying the canal was done and obturated with gutta percha cone with resin based sealer and restored with temporary cement(irm) Patient recalled after 2 week.

Postoperative Follow up

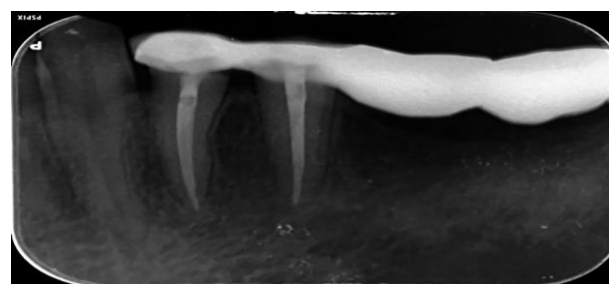
At the next appointment after 1 week, the patient was completely asymptomatic. Temporary cement(irm) was removed and post endodontic restoration was done with composite.



Obturation

Follow-Up Visit

During post operative visit full crown prosthesis was placed i.r.t 34 & 35 . 18 months post treatment radiograph revealed progressive healing of periapical lesion, clinically there was no swelling and patient was completely asymptomatic.



Post-Operative Follow-Up 8 Months

Case Report 2

29-years old male patient was reported to the Department of Conservative Dentistry and Endodontics, in our college with a chief complaint of pain and swelling in maxillary right back tooth region since one week. On examination, there was a pus discharge i.r.t. 26.

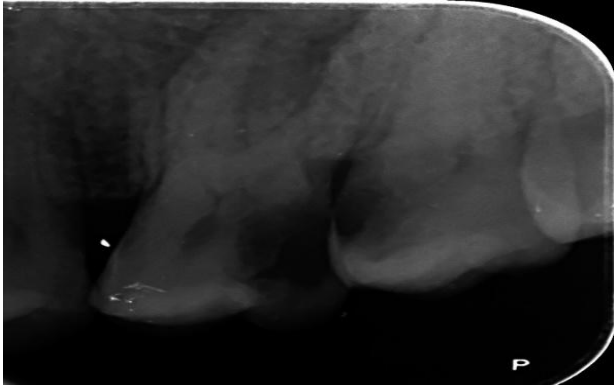


Preoperative Swelling & Pus Discharge

Radiographic Examination & Treatment Planning

RVG recorded during the diagnostic assessment showed signs of large periapical lesion i.r.t 26. The patient was

informed about the need to have the non-surgical endodontic treatment and followup.

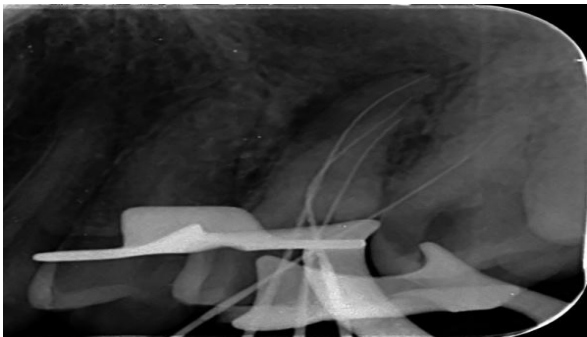


Preoperative RVG

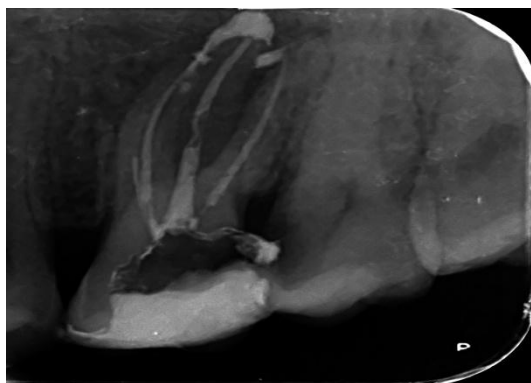
Treatment Procedure

An access opening was done with round bur, there was drainage of yellow straw-coloured fluid from tooth 26. The root canal space was negotiated. The apical foramen was gauged using hand K- files and cleaning and shaping of the root canals was done. 2% Chlorhexidine and normal saline was used as root canal irrigants. There was purulent discharge from the canal.

A 24-gauge needle was attached to a 5-mL syringe and was inserted in to the root canal a yellow straw coloured fluid was aspirated whilst simultaneous digital pressure was applied on the swelling i.r.t 26. The swelling decreased in size completely. once the fluid evacuation was complete the swelling decreased in size completely.



Working length



Metapex placed

The canal was then irrigated with 2% chlorhexidine solution and the canal was dried with paper points, Ca(OH)₂ with iodoform was placed as intra canal medicament. Access cavity was restored with temporary cement (irm) Patient was recalled after 2 week.

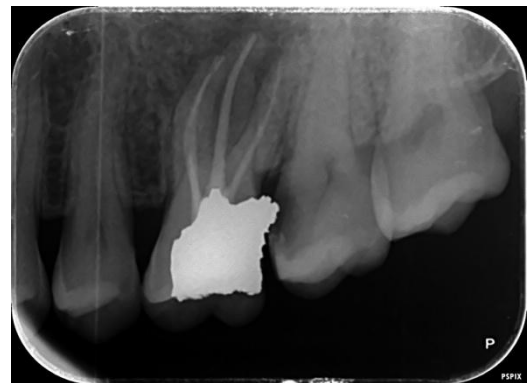
During the recall visit patient was asymptomatic and there was no discharge from the canal. At the next appointment, Cleaning and shaping of the canal was completed, irrigating and drying the canal was done and obturated with gutta percha cone with resin based sealer and restored with temporary cement(irm) Patient recalled after 2 week.

Postoperative Follow up

At the next appointment after 1 week, the patient was completely asymptomatic. temporary cement(irm) was removed and post endodontic restoration was done with amalgam.



Master cone



Post operative

Follow-Up Visit

During post operative visit full crown prosthesis was placed i.r.t 26. 6 months post treatment radiograph revealed progressive healing of periapical lesion, clinically there was no swelling and patient was completely asymptomatic.



Post-Operative Follow-Up 6 Months



Case Report 3

35-years old male patient was reported to the Department of Conservative Dentistry and Endodontics, in our college with a chief complaint of pain in mandibular right back tooth region since one week. On examination, there was a tender on percussion i.r.t 47.

Radiographic Examination & Treatment Planning

RVG recorded during the diagnostic assessment showed signs of large periapical lesion i.r.t 47. The patient was informed about the need to have the non-surgical endodontic treatment and follow up.



Metapex placed

The canal was then irrigated with 2% chlorhexidine solution and the canal was dried with paper points, $\text{Ca}(\text{OH})_2$ with iodoform was placed as intra canal medicament. Access cavity was restored with temporary cement (irm) Patient was recalled after 2 week.

During the recall visit patient was asymptomatic and there was no discharge from the canal. At the next appointment, Cleaning and shaping of the canal was completed, irrigating and drying the canal was done and obturated with gutta percha cone with resin based sealer and restored with temporary cement(irm) Patient recalled after 2 week.

Post-operative Follow up

At the next appointment after 1 week, the patient was completely asymptomatic. temporary cement(irm) was removed and post endodontic restoration was done with amalgam.



Preoperative RVG

Treatment Procedure

An access opening was done with round bur, there was drainage of yellow straw-coloured fluid from tooth 47. The root canal space was negotiated. The apical foramen was gauged using hand K- files and cleaning and shaping of the root canals was done. 2% Chlorhexidine and normal saline was used as root canal irrigants. There was purulent discharge from the canal.



Working length



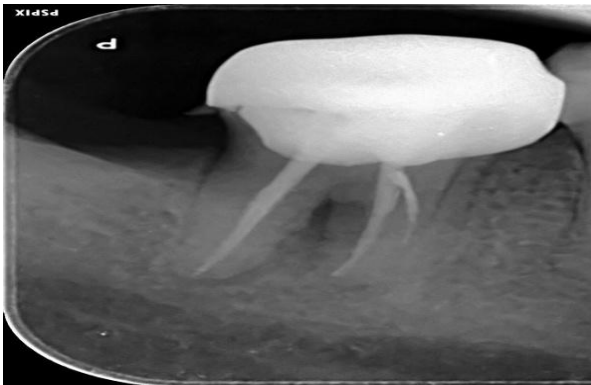
Master Cone



Post operative

Follow-Up Visit

During post operative visit full crown prosthesis was placed i.r.t 47. 6 months post treatment radiograph revealed progressive healing of periapical lesion, clinically there was no swelling and patient was completely asymptomatic.



Post-Operative Follow-Up 6 Months

3. Discussion

The recent criteria and rationale of endodontic treatment of periapical lesion is based on eliminating the bacterial stimulation of the host response at the radicular area and apical foramen that would allow healing of the lesions.^{1,9} Ca (OH) 2 was used as intra canal medicament in this case. The exact mechanism of action of Ca (OH) 2 is speculative. It was suggested that the action of Ca (OH) 2

- Anti-inflammatory activity.
- Neutralization of acid products.
- Activation of alkaline phosphatase
- Anti bacterial action.

It has also been reported that treatment with Ca (OH) 2 resulted in a greater chances of periapical healing, especially in young patients.¹

Blood supply of periradicular tissues have rich, there is a good lymphatic drainage and abundant undifferentiated cells that leads a good healing potential.⁹ The first choice of treatment of periapical lesions should aim to stop and remove microbial infection through treatment of the canals, as an environment favorable to healing.

Bender reported that exceeding the apical zone with penetration into the radio transparent area could contribute to healing by establishing drainage and affording pressure

relief.¹⁰ Seltzer added that excess instrumentation allows drainage of the fluid, with degeneration of the epithelial cells through strangulation, as a result of the proliferation of fibroblasts and collagen.¹¹

In this case, we started instrumentation of the canals after establishing the working length at 0.5–1 mm from the radiographic apex. Irrigating solutions help reduce the microbial flora of the infected canals, and the use of a tissue-dissolving formulation can help eliminate the necrotic tissues.

The healing of periapical lesions compared with surgical, in Surgical management of periapical lesions can be conducted with damage to vital structures, surrounding tissues, scar formation and unpleasant experience to the patient. However for the cases which are not responding to non-surgical endodontic treatment surgical intervention may be the last option. the clinical and radiographic determinants evaluated after periods of over two years are able to establish treatment outcome.¹²

In this case, the follow-up result was obtained respectively after 18 months of follow up.

4. Conclusion

In this case report nonsurgical endodontic treatment proved successful in promoting the healing of periapical lesions. Irrespective of the size of the lesion every attempt should be made to treat the periapical lesions with non – surgical endodontic treatment.

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