

# Non-Surgical Management of Periapical Pathology : A Series of 2 Case Reports

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## Abstract:

Periapical pathologies such as periapical abscesses, periapical granuloma and periapical cyst develop as sequelae to pulpal pathology. Periapical pathologies occur due to untreated bacterial infection of the dental pulp. Surgical management of periapical pathologies cause trauma to the soft tissues and promote slow and more eventful healing. Non-surgical management of periapical pathologies cause fewer traumas to the tissues and also promote faster and less eventful healing. This paper presents 2 case reports on successful non-surgical management of periapical pathology with use of calcium hydroxide as intracanal medicament.

**Keywords:** Calcium Hydroxide; Non-Surgical Management; Periapical Pathologies.

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## Introduction

**N**on-surgical management of periapical pathologies have shown a high success rate. A non-surgical approach should always be adopted before resorting to surgery. Factors considered prior to management of periapical lesion.

- ❖ Proper diagnosis of the periapical pathology: Whether periapical pathology is endodontically related or a bone destroying pathology.
- ❖ Age of the patient: Old age patient might tolerate surgical procedure well in comparison to children.
- ❖ General health status of the patient: Patient with good immunity responds very well to the surgical as well as non-surgical management.
- ❖ Patient cooperation: Patient apprehensive to surgery should be treated non-surgically.
- ❖ Extent of pathology and size of the pathology: Larger pathology does not respond well to the non-surgical management.
- ❖ Proximity to adjacent vital teeth: A surgical approach may result in injury to blood vessels & nerves of adjacent vital teeth.
- ❖ Encroachment on anatomical structures: Surgery increases the risk of damage to the encroaching anatomical structures.
- ❖ Presence of canal obstructions: Ledges, calcified canals, separated instruments makes surgical approach necessary.
- ❖ Time involved for treatment: Non-surgical healing requires a long follow up period if there is fear of losing patient to long follow up, surgery should be opted.
- ❖ Cases refractory to nonsurgical management methods: Surgery is recommended.

The incidence of cysts within periapical lesions varies between 6 and 55%.<sup>1</sup> The occurrence of periapical granulomas ranges between 9.3 and 87.1%, and of abscesses between 28.7 and 70.07%.<sup>2</sup> It is accepted that all in flammatory periapical pathologies should be initially treated with conservative non-surgical procedures. Studies have reported a success rate of up to 85% after endodontic treatment of teeth with periapical lesions.<sup>3</sup> Large periapical pathologies and apical true cysts are of inflammatory origin and should be treated

initially with a nonsurgical approach.<sup>4</sup> Periapical pathologies encountered in endodontic practice result from apical periodontitis due to root canal space infection and are a response of the host defence against the microbial action. The progression of this pathologies results in local inflammation, resorption of hard tissues, and destruction of other periapical tissues. The preliminary diagnosis of chronic periapical pathologies is based on clinical symptoms and subsequent radiological investigations. A histological examination of the pathology is done to confirm the exact nature of the lesion. There have also been reports of lesions in the periapical region which are of non-endodontic origin. All inflammatory periapical pathologies should be initially treated with conservative nonsurgical procedures.<sup>5</sup> Numerous non-surgical methods have been proposed to treat periapical pathologies.<sup>6</sup> Periapical pathologies are sequelae to endodontic infection, caused due to dental caries or trauma and manifest itself as the host defense response to microbial challenge emanating from the root canal system. It is a dynamic encounter between microbial factors and host defenses at the interface between infected radicular pulp and periodontal ligament that results in local inflammation, resorption of hard tissues and destruction of other periapical tissues.

## Various Methods for Non-surgical Management

- ❖ Conservative root canal treatment.
- ❖ Active non-surgical decompression technique.
- ❖ Aspiration irrigation technique.
- ❖ Intracanal medicament technique.
- ❖ Lesion sterilization and repair therapy.
- ❖ Apexum procedure.

This article present series of two case reports describe the non-surgical management of large periapical pathology.

## Case Report

### Case Report: 1

A 29 years old female patient reported to the Department of Conservative Dentistry and Endodontics, of Saraswati Dental College Lucknow, with chief complaint of pain in lower front teeth region since two months. History of

present illness revealed that the pain was mild in intensity. The medical history, family history and habit history were non-contributory. The patient was well oriented to time, place and person. Intra oral examination revealed that tooth 41 was attrited with grade II mobility. It was tender on percussion. Intra oral periapical radiograph revealed that there was an ill-defined radiolucency present at the apex of 41 measuring about less than 1.5 cm in diameter approx. suggestive of periapical pathology (fig. 1). The final diagnosis was given as periapical abscess i.r.t. 41 and differential diagnosis were given as periapical granuloma and periapical cyst. Non-surgical endodontic therapy was planned for 41. After local anaesthesia administration Non-surgical endodontic therapy (root canal treatment) was initiated with pulp chamber i.r.t. 41, working length (fig. 2) was measured and cleaning and shaping of the root canals was done. Saline alternating with 2% chlorhexidine was used as root canal irrigant. Canal was dried with absorbent paper points. Calcium hydroxide mixed with saline dressing was given for 2 weeks. During the recall visit patient was asymptomatic. The tooth was obturated with gutta-percha points and zinc oxide eugenol sealer using lateral condensation technique (fig. 3). 6 month post treatment radiograph revealed progressive healing of periapical pathology (fig. 4).

### Case Report: 2

A 20 years old male patient reported to the Department of Conservative Dentistry and Endodontics, Lucknow with chief complaint of mild pain in upper front teeth and a gum boil associated with same teeth since 2 months. Patient gave history of trauma 10 years back. Medical history, family history, habit history were non-contributory. Clinical examination showed discolored 11, 12 and Ellis Class III fracture in 11. And presence of sinus tract associated with same. Cold, heat and electrical pulp tests elicited negative responses. Intra oral Periapical radiograph showed large periapical ill-defined radiolucency measuring about more than 1.5 cm in diameter present around the apex of the maxillary right central & lateral incisors (fig. 5). The final diagnosis was given as infected periapical cyst i.r.t. 11, 12 and differential diagnosis was given as periapical granuloma

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and periapical abscess. Non-surgical endodontic therapy was planned for 11 and 12. Access cavities were made, working length was determined (fig. 6), bio-mechanical preparation was done by hand K file. Copious irrigation was done with saline alternating with 2% CHX. After the canals were dried with paper points, metapex (Calcium Hydroxide with Iodoform) syringe was inserted and the material was injected into the canals. The metapex was further applied using appropriate size hand file until the canal was completely filled with metapex. The completed filling with metapex was verified with the help of radiograph. The access cavity was sealed with intermediary restorative material. The patient was asymptomatic on follow up visits. The metapex was changed after every two months. Significant bone formation was seen at the periapical region on periodic follow-up radiographs (fig. 7, 8, 9, 10). After eight months when considerable bone formation was noted removal of metapex was done using copious amount of sodium hypochlorite and saline and final rinse with EDTA. Obturation was done in both teeth (fig. 11).

### Discussion

Surgical treatment of all periapical pathologies is not always necessary since they may respond satisfactorily to the adequate endodontic treatment. A nonsurgical approach should always be adopted before resorting to surgery. Patients also are psychologically more anxious about surgical treatment than a non-surgical one. Also one needs to be aware of the risks and complications associated with medically compromised patient during surgical procedures<sup>7</sup>. Non-surgical managements are good for the periapical pathologies. Various nonsurgical methods have been used in the management of periapical pathologies.

Adequate cleaning, shaping, asepsis and filling of the root canal are the keys to success of endodontic treatment. Calcium hydroxide is widely used as an intracanal medicament. The biological actions of calcium hydroxide progress by the ionic dissociation in calcium ion and hydroxyl ion. Antimicrobial activity of is related to release of hydroxyl ions in an aqueous environment. Hydroxyl ions are highly oxidant-free radicals that show extreme reactivity resulting in the damage to bacterial cytoplasmic membrane, protein denaturation, and damage to bacterial DNA<sup>8</sup>.

Its antibacterial actions are due to its effect on bacterial cytoplasmic membranes, protein denaturation, damage to DNA, its action on lipopolysaccharides and its hygroscopic action. In the presence of large periapical lesions such as in our two cases placement of intracanal calcium hydroxide would have a direct effect on inflamed tissue and epithelial cystic linings and in this manner would favour periapical healing and encourage osseous repair<sup>9</sup>. A high degree of success has been reported by using calcium hydroxide beyond the apex in cases with large periapical lesions<sup>10</sup>. It is barium sulphate that is added to the calcium hydroxide paste for radiopacity, which is not readily resorbed when the paste extrudes beyond the apex. However, it has been reported that even though complete resorption of the paste does not occur in some cases, the periapical radiolucency around the paste resolves<sup>10</sup>.

### Conclusion

In this case series non-surgical endodontic therapy proved successful in promoting the healing of large periapical pathologies. Irrespective of the size of the lesion every attempt should be made to treat the periapical pathologies with non-surgical endodontic

therapy

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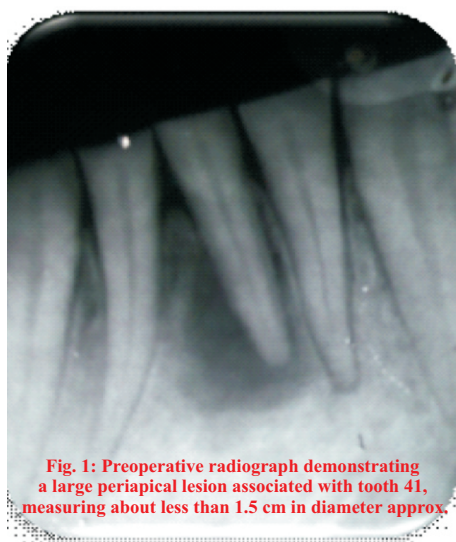


Fig. 1: Preoperative radiograph demonstrating a large periapical lesion associated with tooth 41, measuring about less than 1.5 cm in diameter approx.

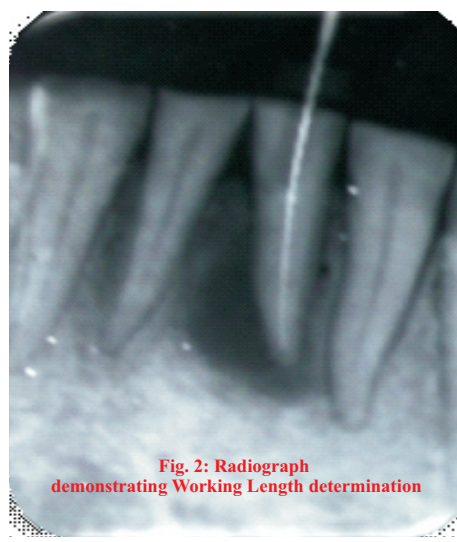


Fig. 2: Radiograph demonstrating Working Length determination

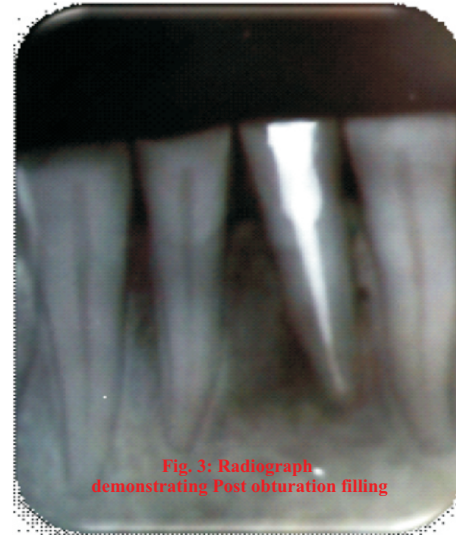


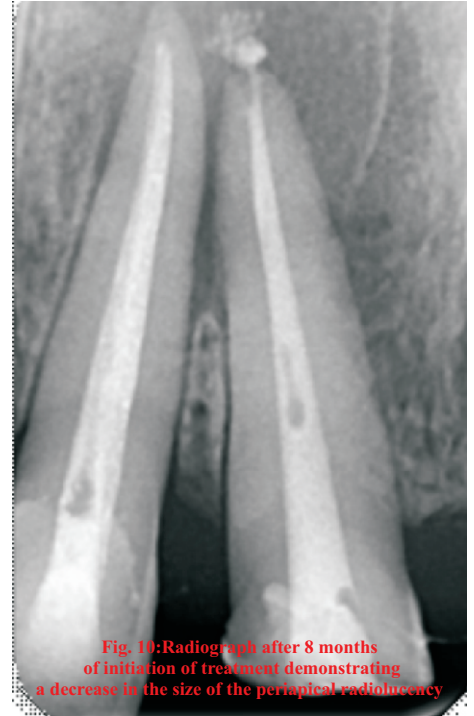
Fig. 3: Radiograph demonstrating Past obturation filling



**Fig. 4:** Radiograph after 6 months demonstrating a decrease in size of the periapical pathology



**Fig. 7:** Radiograph after 2 month demonstrating a decrease in the size of the periapical radiolucency



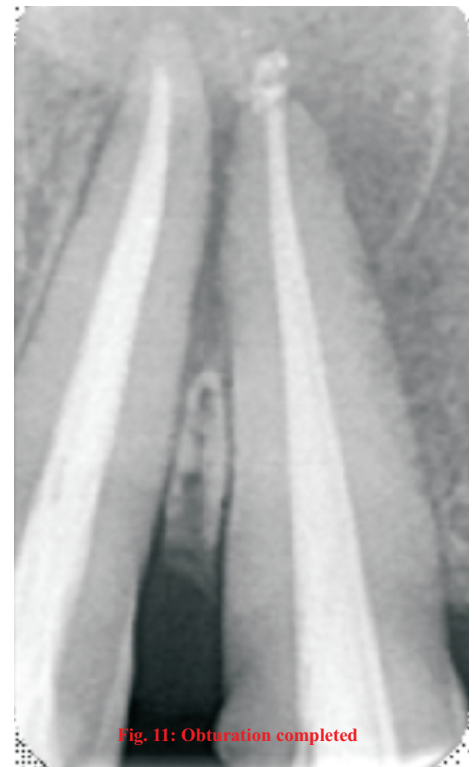
**Fig. 10:** Radiograph after 8 months of initiation of treatment demonstrating a decrease in the size of the periapical radiolucency



**Fig. 5:** Preoperative radiograph demonstrating large periapical lesion associated with teeth 11, 12 measuring about more than 1.5 cm in diameter approx.



**Fig. 8:** Radiograph after 4 months of initiation of treatment



**Fig. 11:** Obturation completed



**Fig. 6:** Radiograph demonstrating Working Length determination



**Fig. 9:** Radiograph after 6 month demonstrating a decrease in the size of the periapical radiolucency