

CASE REPORT

Non-Surgical Endodontic Retreatment: A Ray of Hope

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ABSTRACT

Introduction: Endodontic failures can be attributed to inadequacies in shaping, cleaning and obturation, iatrogenic events, re-infection of the root canal system etc. Nonsurgical endodontic retreatment offers the patient a ray of hope to save a root canal treated tooth that would otherwise be destined for extraction. **Aim:** Nonsurgical endodontic retreatment. **Method:** Endodontic treatment with calcium hydroxide placement as an intracanal medicament. **Result:** Healing of the periapical lesions with successful resolution of signs and symptoms both clinically and radiographically. **Conclusion:** Nonsurgical endodontic retreatment procedures have enormous potential for success if proper guidelines for case selection are followed and the most relevant technologies, best materials and precise techniques are utilized.

Keywords: Iatrogenic, Periapical lesion, Obturation, Intracanal medicament

INTRODUCTION

Root canal system anatomy plays a significant role in endodontic success and failure.¹ There are many cases of failure of endodontic therapy. These cases include iatrogenic procedural errors (perforations, ledges, separation of instruments), missed canals, canals that are poorly shaped and obturated, overextrusion of filling material as well as inadequate canal preparation and compaction of the root canal filling. In order to plan treatment effectively, the clinician must be aware of these etiologic factors which would otherwise lead to persistence of the pathogenesis. Endodontic failures must be evaluated so a decision can be made among nonsurgical retreatment, surgical retreatment, or extraction.^{2,3} Surgical procedure can be a traumatic experience with many disadvantages like pain, edema, and other post-operative complications.

Nonsurgical endodontic therapy requires the need to regain access to the apical area of the root canal space in the previously treated tooth. Coronal access needs to be completed, all root canal fillings need to be removed, canal obstructions must be

managed, and impediments to achieving full working length must be overcome.⁴ After that, all the principles of endodontic therapy apply to the completion of the retreatment case. Nonsurgical endodontic retreatment procedures have enormous potential for success if proper guidelines for case selection are followed and the most relevant technologies, best materials and precise techniques are utilized.⁵⁻⁷ This article will focus on some clinical case reports that produced successful results in nonsurgical endodontic retreatment.

CASE REPORTS

CASE I

A 38 year old male patient reported to our department of Conservative Dentistry and Endodontics, Regional Dental College, Guwahati with pain and palatal swelling in relation to the upper right front teeth. Intraoral periapical radiograph (IOPA) revealed incomplete obturation and periapical radiolucency in relation to upper right front teeth (**Figure 1**). He gave history of trauma to the upper anterior teeth in a fall 4 years back. He had developed palatal swelling and undergone endodontic therapy. The patient remained asymptomatic till reappearance of the palatal swelling, which precipitated him to visit the hospital. The root canal systems of both the teeth were accessed and the old gutta percha removed (utilizing Gates Glidden drills, hand instrumentation with Hedstrom files and Canalsolv gutta-percha solvent). The canals yielded purulent fluid exudate. After one hour following drainage and irrigation, frank discharge subsided and the working lengths were determined for all three teeth both electronically and radiographically. The canals were prepared by a step-back technique with K-type files. Canals were intermittently

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and copiously irrigated with 2 ml of 3% sodium hypochlorite after each instrument change. Irrigation with NaOCl alternated with 17% EDTA solution is done during and after the instrumentation, to remove the smear layer. After chemomechanical preparation was completed, the canals were dried with sterile paper points and calcium hydroxide was introduced into the canal as an intracanal medicament and retained for 2 weeks. Finally, the root canals were obturated with gutta-percha and zinc oxide eugenol sealer using lateral compaction technique. Six months post-operative periapical radiographs reveals significant reduction in size of the periapical lesion and appearance of new trabecular pattern in the region (**Figure 2**).



Figure 1 Preoperative radiograph



Figure 2 Post operative radiograph
Follow up after 6 months

CASE II

A 45-year-old male patient reported to the Department of Conservative Dentistry and Endodontics, Regional Dental College, Guwahati. IOPA confirmed that the patient had a deficient previous root canal treatment on the mandibular right first molar, with incomplete obturation with respect to both mesial and distal roots (**Figure 3**). The tooth was tender on percussion. Endodontic retreatment was planned. All the caries and the former coronal restoration material was removed from the pulp chamber along with the removal of remaining debris, sealer and gutta-percha from the root canals. The access cavity was refined and debridement was done after removing the gutta-percha using canalsolv gutta-percha solvent and hedstrom files. The pulp

chamber was thoroughly rinsed with 3% sodium hypochlorite solution. Working lengths were determined for all three teeth both electronically and radiographically. The canals were prepared initially using K files till no. 25 after which hand protaper files are used and prepared till F 2. Canals were intermittently and copiously irrigated with 2 ml of 3% sodium hypochlorite after each instrument change. Irrigation with NaOCl alternated with 17% EDTA solution is done during and after the instrumentation, to remove the smear layer. After completing cleaning and shaping of all the root canals, final irrigation with sodium hypochlorite, sterile saline and 2% chlorhexidine solution in each root canal was performed. The canals were dried with sterile paper points and an interim dressing of calcium hydroxide was placed as medication in each root canal for 2 weeks. In the second appointment, the calcium hydroxide dressing was removed. The canals were irrigated again and dried with sterile -paper points. Finally, the root canals were obturated with gutta-percha and zinc oxide eugenol sealer using lateral compaction technique. The permanent restoration of tooth was made with amalgam restoration. The patient was reviewed after 3 months, and no pathology was detected both radiologically and clinically (**Figure 4**).

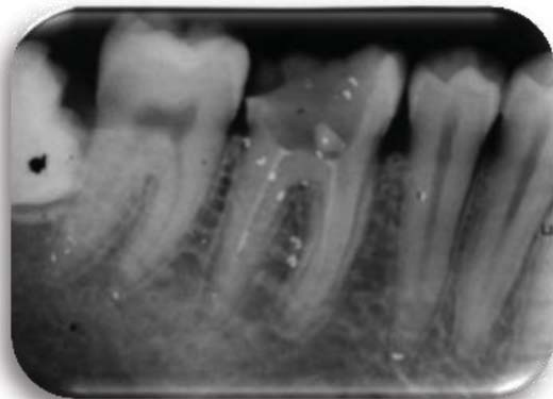


Figure 3 Preoperative radiograph

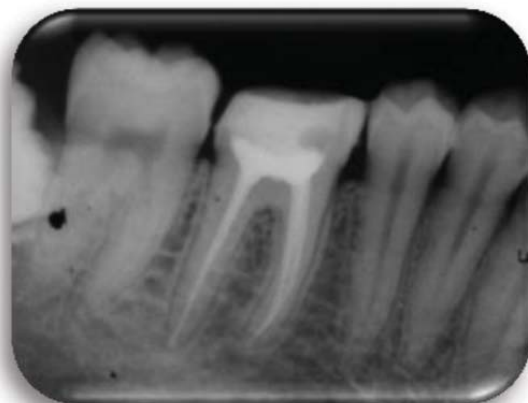


Figure 4 Post operative radiograph
Follow up after 3 months

DISCUSSION

For successful endodontic treatment thorough chemomechanical preparation followed by three dimensional obturation of the root canal system is required. Compromise at any of these steps can lead to failure of the treatment.^{8,9} The two cases presented here were unsuccessful because of incomplete three dimensional sealing of the root canal system. Each of these cases required unique treatment considerations for achieving endodontic goal. Case I required an additional change of calcium hydroxide over a 2 week period before noting elimination of the patient's symptoms. Case II highlighted patient with long-standing symptoms with a long history of numerous repeated nonsurgical retreatment attempts.

Patients increasingly expect to retain their natural dentition and are often reluctant to have teeth extracted. Endodontic retreatment may offer the patient a second chance to save a root-treated tooth that would otherwise be destined for extraction. Many reports have shown a higher success rate when nonsurgical retreatment techniques are employed and, secondly, surgical success is significantly higher when it is preceded by a nonsurgical retreatment.¹⁰ Anatomically, apical deltas are present in the apical two-thirds of root canal systems that may harbour bacteria and their toxins when the tooth has a nonvital pulp. If the remaining bacteria, their by-products and necrotic material are not removed by cleaning and shaping procedures they will be responsible for the persistence of the periapical lesion. In the cases presented above, calcium hydroxide was placed as intracanal medicament. Calcium hydroxide is indisputably the most appropriate intracanal medicament for teeth with periapical lesions, as it removes micro-organisms and promotes repair by controlling the inflammatory action (calcium proteinate bridge formation), neutralizing osteoclasts acid products (acid hydrolases and lactic acid), inducing cellular differentiation (alkaline phosphatase activation and calcium de-pendent ATPases) and neutralization of exotoxins.¹¹ Nonsurgical endodontic retreatment of the above mentioned cases are being performed to overcome the evasive surgical retreatment in terms of functional and psychological effect on patients.

CONCLUSION

Regardless of the enormous potential for endodontic success, certain teeth exhibit post-treatment disease. Nonsurgical

endodontic retreatment, wherever feasible, with an emphasis on effective sealing of infected root canal should be better attempted. This article has identified successfully retreated endodontically failing teeth and verified the role of nonsurgical endodontic retreatment in preserving strategic teeth. Proper selection of cases and careful treatment planning sets the stage for a successful outcome.

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