

Non surgical endodontic retreatment following surgical endodontic failure: A case report

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Abstract

Retreatment in endodontics provides a second chance for the patient to save the tooth that would otherwise be deemed for extraction. Treatment approach can be either surgical or non surgical. Treatment failure can be due to many reasons from missed canal to iatrogenic perforation which has to be evaluated carefully before initiating the treatment. Sometimes a clinician also has to deal with inter appointment flare ups requiring prompt and efficient patient management. This case report describes the non surgical management of failed root filled teeth which had also been treated surgically.

Key words: Calcium hydroxide, Endodontic failure, Retreatment

Introduction

Conventional endodontic treatment may fail due to various reasons and inadequate root canal treatment with persistent infection remaining in inaccessible areas of the canal being one of them^{1,2}.

When patient reports to the dental clinic with severe pain/swelling on the tooth that has previously been root filled they are anxious and skeptic about whole of endodontic treatment posing clinician in tricky state of patient management. Endodontic retreatment offers the patient a second chance to save a root canal treated tooth that would otherwise be destined for extraction.

Such a retreatment can be carried out either surgically or non surgically. Nonsurgical retreatment when possible often is the first choice for attempting to correct obvious deficiencies in the previous treatment. However, surgical retreatment would be the choice in the presence of certain indications like presence of an apical cyst, anatomical or iatrogenic obstruction etc³.

The surgical procedure can effectively remove the infected portion of the root colonized by bacteria either intraradicular or extraradicular or both, thus enhancing the chances of healing. Consequently, complete healing after periapical surgery has been reported in 37%–97%

of teeth. Nevertheless, it can show signs of failure due to poor root canal treatment, faulty surgical procedure, lack of retrofilling⁴.

In case of a surgical failure, re-surgery has showed reduced success rates compared with first-time surgery. It has been reported that success rates were 5%–27% lower for re-surgery compared with first-time surgery⁵. Further surgical procedure can be a traumatic experience with many disadvantages like pain, edema, discolorations and other post operative complications which can hamper the patients daily activities. Hence it is advisable to select a nonsurgical retreatment wherever feasible with an emphasis on effective sealing of infected root canal.

Generally surgical retreatment would be carried out following a nonsurgical endodontic failure, on the contrary, this case report deals with the non surgical retreatment following the surgical treatment failure of a previously endodontically treated maxillary central and lateral incisors.

Case Report

A 32 years old male patient reported with severe pain on upper front teeth since 2 days. He gave a history of root canal treatment 2 years back followed by immediate

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root surgery in the same teeth. He also gave history of on and off pus discharge from the gums in that area since 3 months. On examination, a draining sinus in relation to apical area of left central incisor (21) was seen (Fig 1). There was an acrylic crown in relation to 21 and a GIC restoration on maxillary left lateral incisor (22). The teeth were tender on palpation. On an IOPA radiograph insufficiently obturated canals were noted in relation to 21 and 22 with blunted root apex suggestive of previous root end surgery but with no evidence of any retrograde filling and persistent periapical radiolucency (Fig 2). The subjective and objective findings led to the diagnosis of a surgical endodontic treatment failure with chronic periapical abscess. Patient was explained about the existing condition and the need of retreatment was stressed. However, patient was reluctant to undergo endodontic surgery again, therefore a nonsurgical retreatment of the teeth was agreed.

The nonsurgical treatment was initiated under local anaesthesia by removing the crown of 21, followed by the removal of the access opening filling and gutta-percha obturation from both the teeth (Fig 3). The old gutta percha were removed using H file (MANI, Inc. Japan) and gutta percha dissolving chemical solvent, Xylene (Merck specialities Pvt. Ltd., India). The canal was thoroughly rinsed with normal saline and 2% chlorhexidine (Vishal Dentocare Pvt. Ltd., India). After drying the canals with paper points, CalciCur (Ivoclar Vivadent), a calcium hydroxide based intracanal medicament was placed in the canal and temporised with Zinc oxide eugenol cement. Patient was recalled after one week but patient reported to the clinic after two days with pain due to inter appointment flare up and it was treated by allowing drainage through the root canals of 21 and 22 followed by canal irrigation and access opening sealing as in first visit but without intracanal

medication. Patient was prescribed with medications and scheduled for subsequent visits.

In the following visit, the working length was determined using an apex locator (Root ZX, J. Morita Mfg. Corp.) followed by radiographic confirmation. As the extent of the root canal cleaning and shaping carried out during the previous root canal treatment could not be determined, the canal debridement and shaping was carried out using standardized method by inserting K and H files (MANI, Inc. Japan) up to size 80 and filing the canal walls for the entire working length.

The canal irrigation was carried out by alternate use 3% sodium hypochlorite (Novo Dental Pvt Ltd, India) and 2% chlorhexidine. Following canal cleaning and shaping CalciCur was deposited as an intra canal medicament and the access opening was sealed with zinc oxide eugenol cement.

After 4 weeks of recall and change of the intracanal medicament, the teeth become asymptomatic and the sinus tract healed. In the next visit, the root canals were obturated with gutta percha (Dentsply Maillefer, Switzerland), using thermoplasticized gutta percha master cone method as described by Kerezoudis⁶ using AH Plus (Dentsply Maillefer, Switzerland) sealer and access were sealed with composite resin (Z100, 3M ESPE) (Fig 4). The acrylic crown of 21 which was cemented temporarily between the visits was cemented using GIC luting cement (GC Corporation, Japan). Patient was followed up after one month, twelve months (Fig 5) and twenty four months (Fig 6) the teeth were found to be asymptomatic and there was decrease in the size of the periapical radiolucency, suggesting progressive healing.



Fig 1: Clinical photo of the patient showing draining sinus (circled area)



Fig 2: Preoperative IOPA Radiograph



Fig 3: After Gutta percha removal



Fig 4: Immediate post obturation



Fig 5: 12 months recall

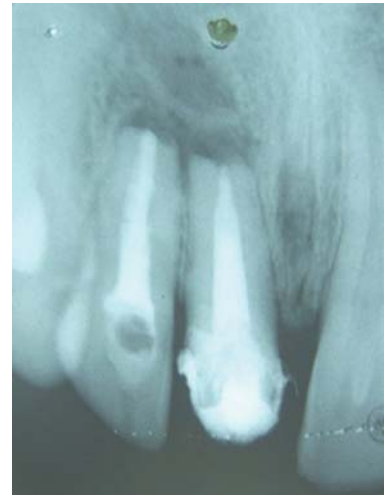


Fig 6: 24 months recall (decrease in size of periapical lesion is evident)

Discussion

Retreatment of failed root filled tooth requires thorough examination and evaluation of the tooth in question because decision of whether to retreat and restore or to extract and restore can be made. Post treatment diseases following an endodontic failure occurs due to complex interaction between various factors explained by Sunqvist⁷. The reason many teeth do not respond to root canal treatment is because of procedural errors that prevent the control and prevention of intracanal endodontic infection⁸. Undoubtedly, the major factors associated with endodontic failure are the persistence of microbial infection in the root canal system and/or the periradicular area^{1,2}.

If root filled tooth has failed, there can be five possible treatment options: To review or do nothing, root canal retreatment, root end surgery, extraction followed by implant or referral. Cross sectional studies from different countries including most recent studies clearly demonstrate that more than 30% of all root filled teeth in the population are associated with apical periodontitis or post treatment disease^{9,10,11,12}. A general guideline has been given by European Society of Endodontology¹³ for indications of retreatment, they are;

- Teeth with inadequate root canal filling with radiological findings and/or symptoms
- Teeth with inadequate root canal filling when the coronal restoration requires replacement
- Teeth with coronal dental tissue that is to be bleached

In this patient nonsurgical retreatment was carried out as the patient was reluctant to undergo reendodontic surgery due to its traumatic nature and associated post operative problems. It has also been shown that the outcome of repeated endodontic surgery was less

favourable than that of primary endodontic surgery for post-treatment disease¹⁴. Nevertheless, going by the periapical status, a surgical retreatment would have looked appropriate but a nonsurgical retreatment was still required due to the previous faulty root canal obturations.

Inter appointment flare up that occurred may be due to disturbance in the microbial ecosystem -due to inadvertent pushing of debris in the periapex- due to over instrumentation or reaction with irrigating solution and solvents or increased virulence of the persistent bacteria at the periapex¹⁵. Other problems that can occur during the retreatment that can even lead to extraction of a tooth would be an irreparable perforation or root fracture^{16, 17}.

A nonsurgical retreatment regimen employing through canal shaping, effective canal irrigation using combination of 2% chlorhexidine and 3% sodium hypochlorite followed by canal disinfection using calcium hydroxide between the visits was followed. This regimen was employed as its efficiency has been proved in many studies in eliminating the intraradicular infection^{18, 19,20,21,22}. Additionally it has been seen that the non surgical retreatment shows improved outcomes with increasing recall time^{5, 23}.

Further, obturation using customized gutta percha facilitated obtaining a good apical seal, which mattered most in this patient as it ensured endodontic success based on nonsurgical treatment alone. In the recall time of one month, one year and two years patient was asymptomatic and there was progressive decrease in the size of the lesion indicating periapical healing. This benefitted the patient by sparing him from the need for a reendodontic surgery.

Conclusion

There is enough potential for success of primary root canal filling but fact remains that clinicians are confronted with post treatment disease. Endodontic retreatment could be a suitable option in case of a post treatment disease following an endodontic failure. Nonsurgical procedures could look of minor importance or insignificant during retreatment, for managing surgical endodontic failure especially when reendodontic surgery appears inevitable. However, with non surgical treatment approach and adequate apical and coronal sealing we can achieve favourable clinical outcome even in case of failed surgically treated teeth.

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