

## Non-surgical retreatment in management of failed root filled teeth

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### ABSTRACT:

Retreatment in endodontics provides the patient with a second chance to save the tooth that would otherwise be considered for extraction. Treatment approach can either be surgical or nonsurgical. Endodontic failure can be due to many reasons from under filled or missed canals to iatrogenic perforations which have to be evaluated carefully before initiating the treatment. Effective removal of gutta-percha in endodontic retreatment is a significant factor in creating successful outcomes from failed procedures. The following series of case reports describes the successful non-surgical management of failed root filled teeth.

**Keywords:** Endodontic failure, Retreatment, Variations in dental anatomy.

### INTRODUCTION

Root canal treatment usually fails when treatment falls short of acceptable standards (Seltzer et al 1963, Engstrom et al 1964, Sjogren 1996, Sundqvist et al 1998). Undeniably, persistence of microbial infection in the root canal system or the periradicular area is the major factor associated with endodontic failure. The clinician is often misled by the idea that procedural errors like broken instruments, overfilled and underfilled canals, perforations, ledges and so on are the direct cause of endodontic failure.<sup>1</sup>

Endodontic retreatment offers the patient a second chance to save a root canal treated tooth that would otherwise be destined for extraction. Endodontic failures should be carefully evaluated so a decision can be made between a nonsurgical root canal treatment (orthograde) versus a surgical root canal treatment (retrograde).

A high percentage of success is achieved with the non surgical approach for treatment and is preferable to surgical treatment.<sup>2</sup>

Post treatment disease (apical periodontitis associated with root canal treated teeth) is primarily caused by infection of the root canal system. Microorganisms may either have survived the previous treatment or breached

the filled root canal space after treatment, coronal leakage being the main cause.<sup>2</sup>

### CASE REPORT

#### CASE REPORT 1

A 36 year old male patient reported to the department of Conservative Dentistry and Endodontics complaining of pain in lower front region on biting and consuming cold or hot drinks. The patient had a past dental history of root canal treatment in the same region 2 months back.

Intraoral examination showed that teeth 31,32,41,42 were tender to percussion. Radiographic findings revealed poorly obturated canals and missed canals in 31,32,41,42 with periapical radiolucency (Figure 1) suggestive of chronic apical periodontitis.



Figure 1: Pre-operative radiograph

In the first visit, the access cavities were reopened. Improperly condensed guttapercha

was removed using RC Solve (Prime Dental Product) and H-files size #20 and #25 (figure 2).The canals were thoroughly irrigated with 3% sodium hypochlorite and saline.

In the following appointment,access cavity was widened bucco-lingually and careful exploration revealed two separate root canals,buccal and lingual in all four teeth. Canals were negotiated and working length for teeth 31,32 was determined using radiographic method (figure 3). To ensure that the additional root canals were not overlooked, it was necessary to image the tooth from different angles.Cleaning and shaping was done with K files (MANI) using step back technique up to #40 instrument.Recapitulation and copious irrigation was done with 3% sodium hypochlorite and saline.In between the treatment appointments an interim dressing of calcium hydroxide was given as an intracanal medicament.

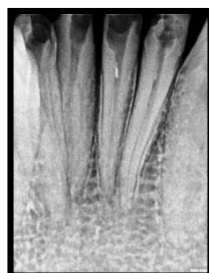


Figure 2: After gutta percha removal

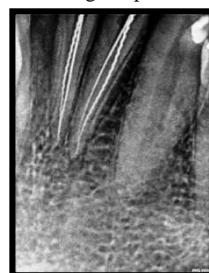


Figure 3: Working length 31,32

On subsequent appointments when the patient became asymptomatic the tooth was scheduled for obturation.The calcium hydroxide dressing was removed,canals were irrigated with saline.Before obturation,the canals were irrigated with a final rinse of EDTA to remove the smear layer.Master cone radiograph was taken and apical tugback was confirmed (figure 4). The canals were then obturated with laterally condensed guttapercha & zinc oxide-eugenol based sealer (figure 5). The access

cavity was closed with a temporary restoration.

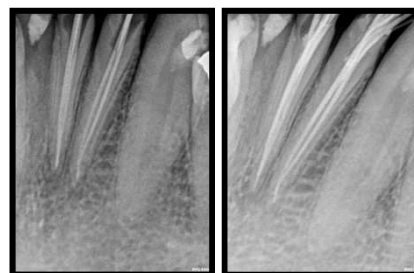


Figure 4 Master cone 31,32; Figure 5: Obturation 31,32

The same procedure was carried out for teeth 41,42 in the following appointments (figure 6-8). Composite post obturation restorations were placed in all four teeth in the final appointment (figure 9). This was followed by placement of final prosthesis (figure 10).

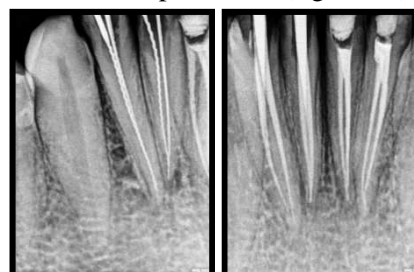


Figure 6: Working length 41,42; Figure 7: Master cone 41,42;

Figure 8: Obturation 41,42

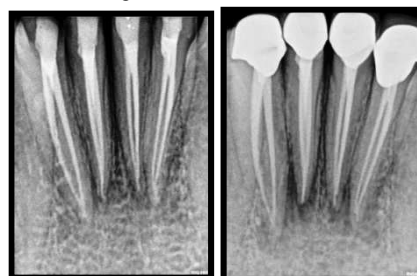


Figure 9: Post obturation restorations; Figure 10: Final Prosthesis 31,32,41,42

## CASE REPORT 2

A 23 year old female patient reported to the department complaining of pain in upper front region on biting.The patient had a past dental history of root canal treatment in the same region 2 years back.

Intraoral examination showed that 11 had an overcontoured full crown impinging the underlying gingiva, which had led to localized gingivitis. Tooth was tender to percussion. Radiographic findings revealed poorly obturated root canal in relation to 11 with the root canal filling overextending beyond the apex (figure 11). Non-surgical retreatment was planned for the same.



Figure 11: Pre operative radiograph

The patient was explained about the treatment plans possible and informed that surgical treatment may be required if non-surgical retreatment fails. An informed consent was obtained.

In the first visit, the access cavity was re-opened in relation to 11. The overextended guttapercha was removed using RC Solve (Prime Dental Product) and H-files size #25 and #30 (figure 12). The canal was thoroughly irrigated with 3% sodium hypochlorite and saline. Patency of apical foramen was achieved and working length was determined using radiographic method (figure 13).



Figure 12: After gutta percha removal; Figure 13: Working length

Cleaning and shaping was done with K files (MANI) using step back technique with apical preparation till #60 instrument and step back till #80 instrument. Recapitulation and copious irrigation was done with 3% sodium hypochlorite and saline. Calcium hydroxide was given as an intracanal medicament and tooth was sealed with temporary restoration.

In the following appointment, when the patient became asymptomatic the tooth was scheduled for obturation. The calcium hydroxide dressing was removed and canal was irrigated with saline. Before obturation, the canal was irrigated with a final rinse of EDTA to remove the smear layer. Master cone radiograph was taken using 2% #60 guttapercha cone and apical tugback was confirmed (figure 14). Obturation was done with laterally condensed guttapercha and zinc oxide-eugenol sealer (figure 15).



Figure 14: Master cone; Figure 15: Obturation

As the tooth had a weak coronal structure, post and core restoration was planned (figure 16). I-post was used, since it has a unique design which enhances post retention (figure 17). A composite resin core build up was done and zirconia crown was given.



Figure 16: Post space preparation; Figure 17: Post selection

## DISCUSSION

The main aim of Re-endodontic procedure is to save the endodontically failed tooth.

Retreatment of such teeth requires thorough examination followed by evaluation of the tooth in question so that decision can be made whether to retreat and restore or to extract and restore. Post treatment diseases that follow an endodontic failure occur due to complex interactions between various factors explained by Sundqvist.<sup>4</sup>

European Society of Endodontology has given a general guideline for indications of retreatment, they are:

- Teeth without adequate root canal filling with radiological findings and/or symptoms
- Teeth without adequate root canal filling when the coronal restoration requires replacement
- Teeth where coronal dental tissue needs to be bleached<sup>3</sup>

For a successful orthograde retreatment, the removal of the endodontic filling material, such as guttapercha, is essential to allow access to the canals for a successful debridement and re-obturation of the root canal system.

Two frequently used solvents for guttapercha removal are Endosolv-E and Endosolv-R (Septodont). Endosolv-E is selected if the sealer contains zinc oxide and eugenol, and Endosolv-R is chosen for resin based pastes.<sup>2</sup>

Once these objectives are attained, the root canal space is cleaned well and re-shaped, thoroughly disinfected and finally sealed. A permanent restoration can then be placed in the end to restore the proper tooth form, function and esthetics.

Most of the root canal re-treatments can be done in multiple sittings with intracanal medication for chronic lesions.

With decades of research behind us, normal predictable anatomy is very easy to treat. It is the rare presentation of unusual anatomy that requires greater patience during treatment and greater adherence to protocol in order to ensure clinical success.<sup>5</sup>

Mandibular anterior teeth don't often show two canals, one labial and one lingual as seen in the first case discussed. According to Grossman the frequency of two root canals exiting into one foramen (Vertucci Type II) in a mandibular incisor is only 5%.<sup>6</sup>

Mechanical irritation occurs as a result of overextension and this overextended material used during root canal obturation could produce an inflammatory response with an area of rarefaction in the periapical tissues. The healing process remains unaffected by the

presence of filling materials as it is well tolerated by the periapical tissues, but it is accepted that a higher failure rate is found in overfilled teeth.<sup>7</sup>

In the presented case series a case of extra canals in four mandibular anterior teeth and a case of overextruded guttapercha in maxillary central incisor were successfully treated nonsurgically.

## CONCLUSION

With available current evidence in support of the non-surgical retreatment many of the teeth with existing post treatment diseases can be managed noninvasively with retreatment rather than going for the surgical approach. It has been seen that high success rates can be achieved for root canal retreatment, especially when failure of the existing root canal treatment was due to technical inadequacy. Nonsurgical procedures could look insignificant during retreatment, for managing endodontic failure especially when re-endodontic surgery appears inevitable. However, with nonsurgical treatment approach and providing an adequate apical and coronal seal, a favourable clinical outcome even in case of failed surgically treated teeth can be achieved.

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