

## Review Article

### RETREATMENT IN ENDODONTICS: A REVIEW

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#### ABSTRACT

Today with the increased awareness, preservation of the teeth by endodontic treatment is preferred by the patients rather than unnecessary extractions. Endodontic treatment has its own advantages and disadvantages. One of the main disadvantages is endodontic failure, which can be because of various factors. These failures can be managed by endodontic retreatment which may be surgical or non-surgical (Orthograde). Usually orthograde is the first opted modality, while surgical retreatment is carried out only when orthograde is not successful. Both have variable results of success according to the studies conducted by various researchers.

Key Words: Endodontic Retreatment, Surgical, Orthograde

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#### DEFINITION

According to the American Association of Endodontists Glossary of Contemporary Terminology for Endodontics, retreatment can be defined as follows:

A procedure to remove root canal filling materials from the tooth, revise the shape, and obturate the canals; usually accomplished because the original treatment appears inadequate or has failed or because the root canal has been contaminated by prolonged exposure to the oral environment. This definition is very limited because it doesn't take into consideration all the situation where there is no previous filling material to be removed, nevertheless the case is failing and needs to be "retreated".<sup>1</sup>

As an alternative, the following definition is suggested to more closely reflect the actual clinical situations encountered during retreatment:

Endodontic retreatment is a procedure performed on a tooth that diagnostically demonstrates incomplete treatment, yet the actual conditions require further endodontic treatment to achieve successful *results*.<sup>1</sup>

#### INTRODUCTION

Retreatment is common in endodontics. The clinical success of an endodontic retreatment seems to depend on whether alterations in the natural course of the root canals were caused by previous root-canal treatment. Few authors related their outcomes to microbiological problems to discriminate root-canal retreatment. Sundqvist et al.<sup>2</sup>, for example, reported an overall success rate of 74% of 50 cases examined after retreatment. They found that the success rate in bacteria-free canals was almost 80%; whereas in teeth with particular bacteria species the outcome was significantly lower (66%). In a study by Sjogren et al.<sup>3</sup>, similar results were achieved and further considerations were made regarding the size of the lesions: the greater the lesion, the lower the success rate. During the diagnostic phase, only clinical signs and symptoms are available for dentists. Further information should be collected using radiographic analysis of the tooth to be retreated. Although Friedman<sup>4</sup> has offered a clear explanation, no attempts have been made to differentiate the many clinical situations and relate them to the final outcome.

## **RATIONALE FOR RETREATMENT**

Root canal system anatomy plays a significant role in endodontic success and failure. These systems contain branches that communicate with the periodontal attachment apparatus furcally, laterally, and often terminate apically into multiple portals of exit.<sup>5</sup> Consequently, any opening from the root canal system (RCS) to the periodontal ligament space should be thought of as a portal of exit (POE) through which potential endodontic breakdown products may pass.<sup>6,7</sup> Improvement in the diagnosis and treatment of lesions of endodontic origin (LEO) occurs with the recognition of the interrelationships between pulpal disease flow and the egress of irritants along these anatomical pathways. Endodontic failures can be attributable to inadequacies in shaping, cleaning and obturation, iatrogenic events, or re-infection of the root canal system, when the coronal seal is lost after completion of root canal treatment. Regardless of the aetiology, the sum of all causes is leakage and bacterial contamination. These endodontic failures can be managed by two ways: either extraction of the involved tooth or retreatment.<sup>8</sup>

## **GOAL**

There are many causes of failure of initial endodontic therapy which have been described in the literature.<sup>9</sup> These include iatrogenic procedural error, untreated canal, canals that are poorly cleaned and obturated, complication of instrumentation (ledges, perforation, etc.) and overextension of root filling material and sometime by self-styled expert. Such 'failures' are most often caused by microorganisms that have either survived the conventional treatment procedures or invaded the root canal system at later stages via coronal leakage. In order to combat the infection, the root canal has to be renegotiated using either an orthograde (nonsurgical retreatment) or a retrograde (surgical retreatment) route of entry. The selection of retreatment procedures primarily has to be based on case-specific factors, such as the technical quality of the root filling and the personal evaluation of risks and monetary costs.<sup>10</sup>

### **Common reasons for endodontic failure include:**

1. Missed canals
2. Coronal leakage
3. Post placement errors
4. Blocks, ledges, perforations and transportations
5. Restoration failures
6. Fractures
7. Inadequately filled canals
8. Separated instruments.

## **Decision Making and Treatment Planning**

According to John S Rhodes (2006), following are the various options for the management of endodontic failures:

- Review or do nothing
- Root canal retreatment
- Root end surgery
- Extraction
- Referral

### **1. REVIEW OR DO NOTHING**

It is carried out when

- There is no symptom i.e. tooth is symptom free.
- There are no chances of future disease.
- No signs of inflammation.
- When there is no faulty restoration and it does not require a new restoration.
- Root canal treatment has only recently been completed and the outcome is uncertain.

### **2. NON SURGICAL RETREATMENT**

It is usually recommended

- When Conventional RCT has failed and there are signs of inflammation or infection associated with a root-filled tooth.
- Symptoms persist from a root filled tooth i.e. the presence of a sinus tract, swelling or pain.
- Tooth is restorable.
- The existing root filling is technically deficient and a new restoration is required

### **3. SURGICAL TREATMENT**

It is usually preferred

- If a very large post were well cemented in an already weakened root, resulting in a high risk of fracture on removal.
- Root canal treatment or non-surgical retreatment has been unsuccessful.
- As an adjunct to root canal retreatment, perhaps in perforation repair or to have adequate apical seal or to remove associated cyst.
- When root or tooth resection is required.
- When a biopsy is required.

### **4. EXTRACTION**

It is opted when

- the tooth is not restorable
- post and core has failed
- Non strategic teeth like 3<sup>rd</sup> molar

## 5. REFERRAL

Patient is usually referred when

- Clinician is unable to make a diagnosis.
- Complexity of treatment is greater than the clinician's expertise

Both surgical and non surgical retreatment options are commonly followed. Various risks for both the treatments are as follows:

### Nonsurgical Retreatment

- Risk of root fracture
- Risk of root perforation
- Instrument separation or marked canal transportation

### Surgical Retreatment

- Nerve damage or sinus complications
- Perforation of the lingual alveolar bone plate or exposure of a root dehiscence
- Pain and swelling.

## DISCUSSION

The need for retreatment has been frequently analyzed by using different points of view. In different European countries, epidemiological studies have shown a large number of teeth to be retreated because of periapical radiolucencies resulting from poor root-canal therapies.<sup>11</sup>

Some authors have reported better clinical results with surgical procedures compared with orthograde retreatment,<sup>12</sup> although others have reported similar clinical outcomes using both techniques with slight differences related only to the time element.<sup>13</sup> Kvist and Reit (2000) compared the results of surgical and non-surgical retreatment. After 1 year, the surgically treated cases had healed more quickly, but after 4 years the slower healing of the non-surgical cases had "caught up" and there were some failures in the surgical group, resulting in no difference.

In 2004, Friedman reported healing rates of nonsurgical retreatment range between 74% and 98%, but with apical surgery alone, only 59% heal completely. Apical surgery preceded by orthograde retreatment 80% healing reported. It should be kept in mind that certain endodontically failing teeth are not amenable to successful retreatment. In these instances, the various interdisciplinary treatment options should be carried out for the best management of the patient. Before commencing with any treatment, it is wise to fully consider all the various treatment options. When the choice is endodontic nonsurgical retreatment, then the goal should be to access the pulp. The practitioner's ability to accurately assess the restorative,

endodontic and periodontal outcomes will result in successful retreatment plans.

## CONCLUSION

The reasons for treatment failure can be multivalent. Correct diagnosis of failure is very important for deciding the retreatment option. Nonsurgical retreatment should be the first treatment choice, except when a canal cannot be completely negotiated because of an apical or coronal obstruction or a re-treatment attempt has already failed. The correct treatment choice can be made with the correct equipment available and the proper skills, adequate knowledge about armamentarium and experience.

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