

# RETREATMENT IN ENDODONTICS

## - Evaluation of success of endodontic treatment

### ○ **Clinical**

- No TOP, Palpation
- No discomfort
- No infection/swelling
- Normal mobility
- No sinus tract
- Normal form, function, and aesthetics

Previously	New Terminology
<b>Success</b>	<b>Healing</b> – Reduced periradicular lesion <b>Healed</b> – Complete elimination of periradicular lesion
<b>Failure</b>	<b>Developing</b> – New periradicular lesion

### ○ **Radiographical** – Radiographic criteria alone is misleading, clinical findings must be included in the decision making.

- Normal/slightly thickened PL space
- Reduction/elimination of previous rarefaction
- No resorption
- Normal lamina dura
- Dense 3-dimensional obturation of canal space

### ○ **Histologic** – Patient can exist in a state of chronic inflammation without measurable symptoms

- Absence of inflammation
- Regeneration of the PL fibers
- Presence of osseous repair
- Repair of cementum
- Absence of resorption
- Repair of previously resorbed areas

Category	Number	% of Total	% Success	% Failure
Good Endo & Resto	330.5	32.7	91.4	8.6
Poor Endo & Resto	213	21.1	18.1	81.9
Good Endo Poor Resto	164.5	16.2	44.1	55.9
Poor Endo Good Resto	302	30.0	69.6	30.4

## - Factors which influence the outcome of treatment

- |  |  |   |
|--|--|---|
| ○ Radiographic Interpretation                    | ○ Thorough debridement and apical level of instrumentation | ○ Disinfection and asepsis of treatment regimen |
| ○ Presence/Absence of periradicular pathosis     | ○ Degree of apical seal at cemento-dentin junction         | ○ Health and systemic status of the patient     |
| ○ Anatomy of root canal system and external root | ○ Degree of coronal seal and coronal restoration           | ○ Clinician's skill and expertise               |

- A treatment with an acceptable outcome can change to an unacceptable outcome due to non-endodontic reasons (fracture, recurrent decay—coronal leaks, periodontal disease, root abrasion/erosion, traumatic occlusion, etc..). Thus, A treated case should be evaluated annually for a minimum of 4 years. Patient education and communication are essential to achieve high levels of compliance and long-term treatment evaluation.

# Endodontic Retreatment

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- In an epidemiologic study conducted in USA, minimum lifespan of an endodontically treated tooth is **8 years**. The incidence of retreatments, apical surgeries and extractions was **3%** and occurred usually within **3 years of treatment completion**. Analysis of extracted teeth revealed that **85%** had **no full coronal coverage**.
- Most common reasons for endodontic failure include missed canals, coronal leakage, post-placement errors, blocks, ledges, perforations and transportations, fractures, inadequately filled canals, separated instruments and resin-based obturating pastes- **all are clinician vectored iatrogenesis-nonetheless preventable**

## Case Selection

- Careful history of the patient
- Evaluate the anatomy of RC
- Evaluate the quality of primary obturation
- Check for iatrogenic complications
- Consider the co-operation of the patient.
- Based on:
  - Restorability of tooth
  - Periodontal condition of the surrounding area
  - Capability of overriding anatomic anomalies (calcifications, obstructions, etc...)
  - Strategic Value of the tooth
  - Economics

## Indications for Retreatment

- Discomfort to thermal stimulus
  - Usually requires the presence of pulp tissue in the tooth because if the pulp has been removed to tooth cannot respond to thermal stimulus. 2 possibilities exist:
    - Untreated canal in the endo-treated tooth
    - Discomfort from another tooth
- If RC treated tooth remains tender even without opposing teeth
  - Recently treated teeth may show some tenderness to percussion, but we can not consider this treatment as unacceptable because symptoms of failure do not appear until months after completion of treatment. This inflammation is usually associated with either lack/loss of apical seal or remnant of pulp tissue. – **Keep this tooth under constant observation.**
- Vertical fracture can be present without radiographic changes – fractures on B and L side of the root may not cause sufficient bone loss to affect the x-ray image.

## Contraindications for Retreatment

- Unfavorable root anatomy
- Presence of untreatable root resorptions, perforations
- Root caries or bifurcation caries
- Insufficient crown/root ratio

## Steps in Retreatment

1. Coronal Disassembly
  - Restoration
  - Cemented Crown
  - Post & Core then crown
    - i. Make space between tooth and post
    - ii. Weaken the retention of post by ultrasonic vibrations
    - iii. Retrieve the post with special pliers using post removal systems (PRS Kits)
    - iv. -or- Forcefully pull the post (increases chance of root fracture)
2. Access to root canal system
3. Remove canal obstructions
  - Silverpoint
    - i. Microsurgical forceps
    - ii. Use of ultrasonic
    - iii. Use of H files
    - iv. Use of hypodermic needle – fits tightly over the silverpoint which **cyanoacrylate** is used as an adhesive. Once set, needle is grabbed with pliers.
    - v. Using instrument removal systems.
  - Gutta-percha
    - i. Solvents: chloroform, benzene, xylene, halothane, eucalyptol
    - ii. Hand instruments: Hedstroem Files
    - iii. Rotary Instruments: Protaper D1, D2, D3
  - Pastes, Cements and Sealers
    - i. Soft-setting cements: files
    - ii. Hard-setting cements: Soften with solvents then files
    - iii. Ultrasonic
    - iv. Long shank small round burs
  - Separated instruments & posts – requires **accessibility and visibility**
    - i. Coronal 3<sup>rd</sup> – attempt retrieval
    - ii. Middle 3<sup>rd</sup> – attempt retrieval/bypass
    - iii. Apical 3<sup>rd</sup> – leave/surgically remove

Coronal 3 <sup>rd</sup> & Middle 3 <sup>rd</sup> (Remove)	Middle 3 <sup>rd</sup> & Apical 3 <sup>rd</sup> (Keep)
<ul style="list-style-type: none"> <li>- recognize how much of coronal tooth structure should be removed to gain access.               <ul style="list-style-type: none"> <li>o If easily accessible, remove using <b>Stieglitz Plier, Masserman Extractor</b> <ul style="list-style-type: none"> <li>▪ <b>Masserman extractor</b> comprises of a tube with constriction into which a stylet is introduced to grasp the separated instrument.</li> </ul> </li> <li>o If dentin thickness is compromised, leave instrument in place.</li> </ul> </li> <li>- Use of modified Gates Glidden bur then an ultrasonic tip to remove it</li> </ul>	<ul style="list-style-type: none"> <li>- Bypass and complete biomechanical preparation</li> <li>- Use irrigation with hypochlorite, H2O2 and RC prep which create effervescence and may float the instrument coronally.</li> </ul>

4. Establish patency
5. Thorough cleaning, shaping and obturation of the canal
  - Sometimes treatment may be difficult due to presence of therapy resistant **Enterococcus Faecalis**, in this case, slightly enlarge the canal more than before to completely remove residues of previous treatment.

## Outcomes of re-treatment

- Could be short-term or long-term
  - Short-term: post-operative discomfort including pain and swelling
  - Long-term: depend on regaining canal patency and obturation of root canal system
- Effective communication between clinician and patient about potential problems should be discussed before re-treatment.