

ROOT CANAL SEALERS USED IN ENDODONTICS

Ismailova Dilnoz Kurbanovna

Faculty of Medicine, International University of Asia, Uzbekistan

<https://doi.org/10.5281/zenodo.15693416>

Abstract. Root canal sealers play a critical role in the success of endodontic treatments. They are used in combination with core filling materials to achieve a hermetic seal of the root canal system, prevent reinfection, and promote periapical healing. This article provides an overview of the types, properties, and clinical significance of root canal sealers used in modern endodontic practice.

Keywords: Root canal, hermetic seal, filling materials, tissue fluids.

Introduction

Endodontic treatment, commonly known as root canal therapy, involves the removal of infected pulp tissue, disinfection of the root canal, and sealing of the canal to prevent microbial reinfection. While gutta-percha is the most widely used core filling material, it cannot achieve a complete seal on its own. Therefore, root canal sealers are used to fill the microscopic gaps between gutta-percha and the canal wall, enhancing the success of the treatment.

Purpose of Root Canal Sealers

To fill voids and irregularities between the root canal wall and the core material

To seal lateral and accessory canals

To enhance the adaptation and retention of the core filling material

To act as a lubricant during obturation

Ideal Properties of a Root Canal Sealer

An ideal root canal sealer should have the following characteristics:

Excellent sealing ability

Biocompatibility

Radiopacity

Long working time and short setting time

Antibacterial properties

Insolubility in tissue fluids

Easy application and removal if necessary

Types of Root Canal Sealers**1. Zinc Oxide Eugenol-Based Sealers**

These are among the oldest types and include products such as Grossman's sealer. They have good sealing ability but may dissolve over time.

2. Calcium Hydroxide-Based Sealers

These sealers offer antimicrobial properties and stimulate hard tissue formation.

However, their solubility can be a drawback.

3. Resin-Based Sealers

Epoxy resin-based sealers (e.g., AH Plus) are widely used due to their good adhesion, low solubility, and excellent sealing properties.

4. Glass Ionomer-Based Sealers

These sealers bond chemically to dentin and have fluoride release capability, but their brittleness limits their popularity.

5. Bioceramic-Based Sealers

Bioceramic sealers (e.g., EndoSequence BC Sealer) are highly biocompatible, antimicrobial, and promote healing. They are becoming increasingly popular in modern endodontics.

Clinical Application

Root canal sealers are typically applied using one of the following techniques:

Lentulo spiral: A rotating instrument to carry sealer into the canal

Paper points: Used to spread and compact the sealer

Injection: For injectable sealers, especially bioceramic types

Coating the gutta-percha: Sealer is applied directly to the master cone before insertion

Conclusion

The selection of an appropriate root canal sealer is crucial to the long-term success of endodontic treatment. With advancements in material science, modern sealers offer improved biocompatibility, sealing ability, and antimicrobial effects. Clinicians should choose sealers based on the clinical situation, patient needs, and material properties to achieve optimal outcomes.

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