



Type of the Paper (Editorial)

Recent Advances endodontic sealers

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Citation: Tamer M. Hamdy. *Recent Advances Recent Advances endodontic sealers*. *Biomat. J.*, 2 (4),1 – 2 (2023).

<https://doi.org/10.5281/znodo.5829408>

Received: 25 April 2023

Accepted: 30 April 2023

Published: 30 April 2023



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Abstract: Bioceramic-based endodontic sealers were utilized as a root canal sealer due to their great biocompatibility and idleness. Later era of bioceramic-based endodontic sealers has risen as a novel fabric with a bioactivity potential grants an impermeable seal to the root canal framework that stands out compared with customary root canal sealers.

Keywords: Bioceramics; endodontic sealers

Preparations based on bioceramics have recently been introduced to the market due to their interesting physical, chemical and biological properties compared to traditional endodontics. Several bioceramic-based sealants are being introduced to the market.

Unlike traditional endodontic sealants, bioceramic sealants are hydraulic and hygroscopic and have a unique healing process. In addition, it had an excellent property due to its biocompatibility, antimicrobial activity and bioactivity, which affected mineral deposition during treatment, promoting a chemical bond with the tooth walls in the biological environment, which improves their sealing ability.

The high alkalinity of the bioceramic endodontic seal increases the mineralization process and induces its antimicrobial effect. However, the stability of these dimensions remains controversial. Some studies have found no shrinkage of bioceramic endodontic sealants during healing, while other studies have found slight expansion during healing.

The composition of bioceramic-based endodontic sealants mainly consists of some or all of the following components; calcium silicates, calcium phosphate, calcium, hydroxide, zirconium oxide, fillers and thickeners. Bioceramics is a term that refers to a class of biomaterials that contain ceramics.

Bioceramics are primarily designed for medical and dental applications to be truly biocompatible. Therefore, bioceramics can be defined as biocompatible ceramic materials or metal oxides that include silica, alumina, zirconium, bioactive glasses, ceramics, calcium silicates, hydroxyapatite, and calcium phosphate.

There are two main advantages of using bioceramic endodontic sealants. First, their excellent biocompatibility avoids side effects of the surrounding tissues, allowing clinical success in cases where there is a high risk of compression of the material into the periodontium, such as internal resorption over an open apex and root or iatrogenic instruments.

Second, the bioactivity of bioceramic endodontic sealants, which is related to the calcium phosphate component, which improves the chemical bond between the crystalline structure of the tooth and the bioceramic sealants by depositing a layer of apatite on the interface, forming the so-called "monobloc" concept and then achieving an airtight seal and creating strong chemical bonds between dentin and core filling materials.

Although bioceramic endodontics vendors have shown promising results as endodontics. Further studies are necessary to determine the clinical results associated with the use of these concentrations.

Controversy regarding the difficulty in removing them from the root canal during rehabilitation is a significant issue among clinicians. In addition, research has revealed that changes in the water content of the environment negatively affect the healing time of bioceramic sealants.