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Bioceramic root canal sealers: A brief review

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Abstract
Bioceramic root canal sealers are a relatively new technology in endodontics that have gained popularity in recent years due to their unique properties and potential advantages over traditional root canal sealers. The aim of this brief review was to consider the properties of bioceramic sealers and their performance in the clinical scenario. An extensive search was conducted on this topic to identify articles related to bioceramic-based root canal sealers. Several studies were evaluated covering different properties of these sealers.
Conclusion: Future directions in this topic will be beneficial in the field of regenerative endodontics and many more.

Keywords: Bioceramic root canal sealers, biocompatibility, tissue regeneration

Introduction
Bioceramic root canal sealers are a relatively new technology in endodontics that have gained popularity in recent years due to their unique properties and potential advantages over traditional root canal sealers. These sealers are composed of bioceramic materials that have excellent biocompatibility properties, are non-toxic, and have dimensional stability [1]. Bioceramic sealers also have bioactivity potential that stands out compared to conventional root canal sealers [2]. The primary role of root canal sealers is to close cavities in the canal and open accessory canals, creating a connection between the root canal filling and the root canal dentin [3]. Bioceramic sealers have been shown to be advantageous in this regard, as they can create a tight seal and promote tissue regeneration [4].
The historical development of bioceramic root canal sealers is relatively recent. The first bioceramic root canal sealer, MTA Fill apex, was introduced in 2008 [5]. Since then, several other bioceramic sealers have been developed and are currently available in the market. These include Endo Sequence BC Sealer, iRoot BP Plus, and Total Fill BC Sealer [4].
While bioceramic root canal sealers have several advantages over traditional sealers, they also have some disadvantages. One major disadvantage is the difficulty in removing them from the root canal once they are set for later retreatment or post-placement [4, 5]. Additionally, some studies have reported that bioceramic sealers may have lower sealing ability compared to traditional sealers [3]. However, the current generation of epoxy resin-based sealers has drawbacks such as mutagenicity, cytotoxicity, inflammatory response, and hydrophobicity [6]. Overall, bioceramic root canal sealers are a promising technology in endodontics, and further research is needed to fully understand their potential advantages and disadvantages.

Bioceramic Root Canal Sealer Properties and Performance
Bioceramic root canal sealers have gained popularity in recent years due to their unique chemical and physical properties. These sealers are composed of biocompatible materials that mimic the natural composition of tooth structure, making them an ideal choice for root canal treatment [4]. Bioceramic sealers have several physical properties that make them superior to traditional sealers, including excellent sealing ability, dimensional stability, and low solubility [3].
These properties ensure that the sealers provide a tight seal, preventing bacterial leakage and reducing the risk of reinfection [5].

Biocompatibility is a crucial factor to consider when selecting a root canal sealer. Bioceramic sealers have been shown to be highly biocompatible, with minimal tissue response and inflammation [4]. In contrast, traditional sealers, such as epoxy resin-based sealers, have been found to have several drawbacks, including mutagenicity, cytotoxicity, inflammatory response, and hydrophobicity [6]. The biocompatibility of bioceramic sealers makes them a safe and effective option for root canal treatment.

Clinical studies have demonstrated that bioceramic root canal sealers provide excellent clinical outcomes. A recent study by Zamparini et al. analyzed the chemical and physical properties and bioactivity of three newly introduced premixed bioceramic root canal sealers and found that they performed well in terms of sealing ability, biocompatibility, and dimensional stability [7]. These findings suggest that bioceramic sealers are a promising option for root canal treatment, providing superior physical and chemical properties, excellent biocompatibility, and favorable clinical outcomes.

Future Directions and Conclusion

Current research and development in bioceramic root canal sealers has shown promising potential for use in endodontic therapy. Bioceramic-based sealers have been found to be biocompatible and comparable to other commercial sealers, with clinical outcomes associated with their use being positive [8]. Several bioceramic sealers, such as Endosequence BC Sealer, iRoot® SP, and MTA, have shown favorable results in multiple studies [2]. However, it is important to note that different bioceramic root canal sealers have varying toxicities and properties [6], and further research is needed to fully understand their potential applications in endodontic therapy [4].

Potential applications of bioceramic root canal sealers in endodontic therapy are numerous. Bioceramic sealers have the potential to stimulate tissue repair and regeneration [3]. Future research in this area may lead to the development of new treatment modalities for endodontic therapy, such as regenerative endodontics [5].

In conclusion, bioceramic root canal sealers represent an innovative and promising technology in endodontic therapy. While further research is needed to fully understand their potential applications and properties, current evidence suggests that bioceramic sealers have superior sealing ability and biocompatibility compared to traditional sealers. Clinicians should consider incorporating bioceramic sealers into their practice, particularly in cases where traditional sealers have failed or are contraindicated [4].

Acknowledgement

Nil

Conflict of Interest

Nil

References

1. Al-Haddad A, Che Ab Aziz ZA. Bioceramic-based root canal sealers: a review. International journal of biomaterials; c2023. From worldwidejournals.org
2. Estivalet MS, de Araújo LP, Immich F, da Silva AF, Ferreira ND, da Rosa WL. Bioactivity Potential of Bioceramic-Based Root Canal Sealers: A Scoping Review. Life. 2022 Nov 11;12(11):1853.
3. (PDF) Bioceramic root canal sealers: A review. (n.d.) Retrieved. 2023 Sept 7. From www.researchgate.net
4. Bioceramic-Based Root Canal Sealers: A Review - PMC. (n.d.) Retrieved. 2023 Sept 7. From www.ncbi.nlm.nih.gov/pmc/articles/PMC4868912/
5. Bioceramic-Based Root Canal Sealers: A Review. (n.d.) Retrieved. 2023 Sept 7. from www.hindawi.com/journals/ijbm/2016/9753210/
6. Bioceramics. As Root Canal Sealers: A Literature Review. (n.d.) Retrieved September 7, 2023, from www.pnrjournal.com
7. Chemical-Physical Properties and Bioactivity of New. (n.d.) Retrieved. 2023 Sept 7. From www.mdpi.com/1422-0067/23/22/13914

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