

## An overview of the use of bioceramics in endodontics.

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Endodontics is a specialized branch of dentistry that deals with the study and treatment of the dental pulp and tissues surrounding the teeth. One of the most significant advancements in endodontic treatment has been the introduction of bioceramics. Bioceramics are ceramic materials that are biocompatible, non-toxic, and have high mechanical strength. They have revolutionized the field of endodontics by providing dentists with new tools to treat dental diseases effectively. This article aims to provide an overview of the use of bioceramics in endodontics. The use of bioceramics in endodontics is based on the principle of biomineralization, which refers to the process of synthesizing biominerals that can repair and regenerate tissues. Bioceramics are used to create biomineral-based materials that mimic the natural mineralization process of dental tissues. Bioceramics have been found to be effective in the regeneration of dentin, pulp tissue, and periodontal ligament [1].

Bioceramics have several advantages over traditional endodontic materials such as gutta-percha, silver points, and zinc oxide eugenol. Bioceramics have excellent sealing ability, biocompatibility, and antibacterial properties, which make them ideal for use in endodontics. They are also stable and resistant to degradation, making them suitable for long-term use. One of the most significant advantages of bioceramics is their ability to promote tissue regeneration. Bioceramics have been found to induce the formation of hydroxyapatite, which is a mineral that is present in the natural teeth [2]. This mineralization process promotes the regeneration of dentin and pulp tissue, which are essential for the maintenance of dental health. Bioceramics are also ideal for use in root canal treatment. The root canal is a complex system of tiny channels that run through the teeth. Traditional endodontic materials such as gutta-percha have been found to be inadequate in sealing these tiny channels, which can lead to the recurrence of infections. Bioceramics have been found to have excellent sealing ability, which makes them ideal for use in root canal treatment [3].

Another significant advantage of bioceramics is their antibacterial properties. Bioceramics have been found to be effective in killing bacteria that are responsible for causing dental infections. This makes them ideal for use in the treatment of dental diseases such as pulpitis, apical periodontitis, and periapical abscess. Bioceramics have also been found to be ideal for use in endodontic surgery. Endodontic surgery is a specialized procedure that is used to treat dental diseases

that cannot be treated using traditional endodontic techniques. Bioceramics have been found to be effective in promoting tissue regeneration, which makes them ideal for use in endodontic surgery. One of the most significant challenges of using bioceramics in endodontics is their cost. Bioceramics are more expensive than traditional endodontic materials such as gutta-percha. However, the benefits of using bioceramics in endodontics outweigh their cost. Bioceramics are effective in promoting tissue regeneration, which can lead to better dental health outcomes. The use of bioceramics in endodontics has revolutionized the field of dentistry. Bioceramics have several advantages over traditional endodontic materials such as gutta-percha, silver points, and zinc oxide eugenol. Bioceramics have excellent sealing ability, biocompatibility, and antibacterial properties, which make them ideal for use in endodontics. Bioceramics have also been found to be effective in promoting tissue regeneration, which is essential for the maintenance of dental health [4].

Bioceramics are available in several forms, including powder, paste, and injectable forms. The choice of form depends on the specific application and the preference of the dentist. Bioceramics can be used alone or in combination with other endodontic materials. For example, bioceramics can be used in conjunction with gutta-percha to provide better sealing of the root canal system. Bioceramics have been found to be effective in treating a variety of dental diseases, including periapical lesions, resorptive defects, and open apices. Bioceramics have a high pH, which can help neutralize acidic environments that are often present in dental infections. Bioceramics have been found to have excellent biocompatibility, which means that they do not cause any adverse reactions in the body. This makes them safe for use in dental procedures. Bioceramics are highly resistant to degradation, which means that they can last for a long time in the body without deteriorating. Bioceramics have been found to be effective in promoting the attachment of cells to dental implants. This makes them useful in the field of implant dentistry. Bioceramics can also be used in the repair of dental fractures and defects. For example, bioceramics can be used to fill in defects in the enamel or dentin of the teeth. Bioceramics can be used in conjunction with regenerative techniques such as platelet-rich plasma (PRP) to promote tissue regeneration in dental procedures. Bioceramics can be used in the treatment of pediatric dental diseases. Bioceramics have been found to be effective in promoting pulp tissue regeneration in immature permanent teeth [5].

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In summary, bioceramics are versatile materials that have a wide range of applications in endodontics. They have several advantages over traditional endodontic materials and have been found to be effective in promoting tissue regeneration and treating a variety of dental diseases. Although they are more expensive than traditional materials, the benefits of using bioceramics in endodontics make them a worthwhile investment.

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