The Use of Bioceramics in Endodontics

Assoc. Prof. Luminita-Maria Nica
Faculty of Dentistry, Victor Babes University of Medicine and Pharmacy Timisoara
IIIrd Department
Discipline of Restorative Dentistry and Endodontics

Bioceramics are ceramic materials designed specifically for medical and dental use, commonly used for orthopaedic treatments, and for coating metal implants to improve biocompatibility.

The first bioceramic material successfully used in endodontics was the MTA cement (Mineral Trioxide Aggregate), developed based on Portland cement, in the Loma Linda University – California, in the early 90's. It was developed as a retrograde filling material and also for perforations closing.

Based on the popularity of MTA materials used in endodontic therapy, a new category of root canal sealers has been recently developed. These sealers are based on tricalcium silicate, a hydraulic powder used for vital pulp therapy and various surgical treatments. Formerly known as Bioceramic sealers, these materials are currently forming a specific category of sealers, named Calcium silicate sealers.

The tricalcium silicate cements/sealers set by reaction with water and form in the root canal a dimensional stable barrier, especially important for the long-term success of endodontic therapy. They are highly radiopaque and hydrophilic, and due to their highly alkaline pH, are anti-bacterial during setting. Other major advantages of bioceramic materials used as root canal sealers are the biocompatibility and bioactivity.

Although the majority of papers show favorable properties for bioceramic materials, they are based on in vitro studies, so it is not clear if any of these results influence clinical success.

The aim of the lecture is to describe these materials, their properties and use in endodontic therapy.