A Fast-Setting Moisture-Tolerant Root Canal Retrofilling and Repair Material

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SUMMARY

Dr. Shane White and colleagues have developed a class of novel low-cost root repair materials that are biocompatible, easy to set and manipulate, have good abrasion resistance, and good dissolution resistance.

BACKGROUND

Root canal therapy and other dental repair procedures often require a material to repair and cap the root. This cap material is necessary to prevent the leakage of irritants which may ultimately cause failure of the root canal. Root capping materials must therefore have excellent leakage resistance. A significant challenge is finding a material that exhibits good leakage resistance while also exhibiting good biocompatibility, good durability, and short setting times. Mineral trioxide aggregate (MTA) is a widely used material due to its stability and biocompatibility. However, MTA has low abrasion and dissolution resistances and requires several hours to set. Other, resin-based materials have improved physical properties and fast light curability, but suffer from low biocompatibility. Calcium sulfate has a long history of use in dentistry due to its low cost and biocompatibility. However, calcium sulfate is relatively soluble and would be a poor material for moist environmental applications, such as root caps. The development of a technology that can provide the desired benefits without the drawbacks of current materials would allow for lower cost and lower maintenance endodontic therapy.

INNOVATION

Professor White and colleagues have developed a new endodontic root-end filling, repair, obturating, and pulp capping material. The filling material has none of the disadvantages of currently used materials, such as mineral trioxide aggregate (MTA) and resin-modified glass-ionomers. Yet, it boasts additional advantages such as moisture friendliness a quick light-cure command set, wide clinical application, and low cost. The technology has applications in dental offices as an alternative to existing materials for root end-filling during root canal surgery and other dental procedures.

APPLICATIONS

Root repair and retrofilling material for endodontic therapy, including:

- Root end-filling
- Perforation repair
- Treatment of resorptive defects
- Treatment of vital exposed pulps
- Obturation of immature non-vital teeth

ADVANTAGES

Improved physical properties in dry and moist environments compared to commonly used MTA

- Good biocompatibility
- Possible promotion of osteogenesis in surrounding area
- Lower cost component materials compared to MTA
- Light curable and easy to manipulate

STATE OF DEVELOPMENT

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OTHER INFORMATION

KEYWORDS

Dental filling, light-cure, endodontics

CATEGORIZED AS

- **Materials & Chemicals**
  - Biological
- **Medical**
  - Disease: Dental

RELATED CASES

2013-309-0

Prototype materials in this class have been fabricated. Testing and characterization of materials is underway.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,889,071	02/13/2018	2013-309

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