Critically Appraised Topic (CAT)

Project Team:
10-A3
Project Team Participants:
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Clinical Question:
What is the most biocompatible material to use for a root end fill in an apicoectomy procedure?
PICO Format: What are the relative success rates of materials used for apicoectomy retrofill? Specifically, composite/amalgam versus MTA.
P:
Presence of infection in previously root canal treated tooth.
I:
Endodontic microsurgery (apicoectomy) with MTA as filling material.
C:
Composite or amalgam as filling material.
O:
Success with using these materials.
PICO Formatted Question:
When performing apicoectomy, how does long term success differ when using composite/amalgam vs. MTA?
Clinical Bottom Line:
When compared to traditional materials for root end filling such as composite and amalgam, MTA has better biocompatibility and creates a better seal, which is imperative for treatment success.
Date(s) of Search:

11/2/2020

Database(s) Used:

Pub-Med

Search Strategy/Keywords:

apicoectomy retrofill material

MESH terms used:

endodontic microsurgery, amalgam, composite, MTA

Article(s) Cited:

Biocompatibility of root-end filling materials: recent update
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3761119/

Study Design(s):

Systematic Review of RCT and in vitro/in vivo studies

Reason for Article Selection:

This literature review compares biocompatibility and tissue response across different materials, with no potential conflict of interest.

Article(s) Synopsis:

This article reviewed the following root-end filling materials: amalgam, gutta percha, ZOE cement, GIC, composite resins and resin-ionomer hybrids, Diaket, MTA, other MTA formulations, and new materials such as bioceramic putty and biodentine. The purpose of root end filling is to provide a seal after apicoectomy. MTA's tissue response and biocompatibility makes it a very promising material to use, especially over traditional materials such as composite and amalgam.

Levels of Evidence: (For Therapy/Prevention, Etiology/Harm)
See http://www.cebm.net/index.aspx?o=1025

☐ **1a – Clinical Practice Guideline, Meta-Analysis, Systematic Review of Randomized Control Trials (RCTs)**
☐ **1b** – Individual RCT
☐ **2a** – Systematic Review of Cohort Studies
☐ **2b** – Individual Cohort Study
☐ **3** – Cross-sectional Studies, Ecologic Studies, "Outcomes" Research
☐ **4a – Systematic Review of Case Control Studies**
☐ **4b** – Individual Case Control Study
☐ **5** – Case Series, Case Reports
☐ **6** – Expert Opinion without explicit critical appraisal, Narrative Review
☐ **7** – Animal Research
☐ **8** – In Vitro Research

Strength of Recommendation Taxonomy (SORT) For Guidelines and Systematic Reviews
See article **J Evid Base Dent Pract 2007;147-150**
☐ **A – Consistent, good quality patient oriented evidence**
☐ **B** – Inconsistent or limited quality patient oriented evidence
☐ **C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening

Conclusion(s):

Based on in vitro investigation, in vivo investigation, and clinical trial MTA is a biocompatible root filling material. Further research and clinical trials are required to test newer materials.