**Critically Appraised Topic (CAT)**

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| **Project Team:**  |
| **Group 6A-5**  |
| **Project Team Participants:**  |
| **Carli Hogan, Hanna Benelhachemi, Jessica Romano, Cameron Johns** |
| **Clinical Question:** |
| **Why are silver points no loner recommended as an obturation material for RCT?** |
| **PICO Format:** |
| **P:** |
| **Patients reciving root canal therapy**  |
| **I:** |
| **Silver point fillings**  |
| **C:** |
| **Gutta Percha**  |
| **O:** |
| **Likelihood of retreatment** |
| **PICO Formatted Question:** |
| **In patients who have had root canal therapy, do teeth obtutrated with silver point fillings, as compared to teeth obturated with gutta percha, have an increased likelihood of requiring retreatment?**  |
| **Clinical Bottom Line:** |
| **Patient has symptomatic #14 with PARLS at apex of MB and P roots that was previously treated with silver point fillings in another country.** |
| **Date(s) of Search:**  |
| **9/20/2020** |
| **Database(s) Used:** |
| **PubMed** |
| **Search Strategy/Keywords:** |
| **Silver Points AND Root Canal**  |
| **MESH terms used:** |
| **Gutta Percha** **Root Canal Filling Materials****Root Canal Obturation****Silver\*** |
| **Article(s) Cited:** |
| 1. Wollard, Ronald R., et al. “Scanning Electron Microscopic Examination of Root Canal Filling Materials.” *Journal of Endodontics*, vol. 2, no. 4, 1976, pp. 98–110., doi:10.1016/s0099-2399(76)80147-1.
2. Chana, et al. “Degradation of a Silver Point in Association with Endodontic Infection.” *International Endodontic Journal*, vol. 31, no. 2, 1998, pp. 141–146., doi:10.1046/j.1365-2591.1998.01136.x.
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| **Study Design(s):** |
| 1. **Invivo Study**
2. **Case Report**
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| **Reason for Article Selection:** |
| **Article 1: Historically, silver point fillings were well accepted as a root canal obturation material until it was replaced by more modern root canal fillings, such as gutta percha. This article uses scanning electron microscope to study and compare both silver point fillings and gutta percha and their efficacy as an obturation material. I chose this article as it addresses the PICO question and discusses the shortcomings of silver point fillings as an obturation material.** **Article 2: This article is a case report that presents a patient with a symptomatic tooth that was previously treated with a silver point filling. This article directly address the PICO question as it discusses the need for retreatment of a RCT tooth with a silver point filling. I chose this article in hopes that the symptoms of a failing silver point filling would overlap or compare to our patient’s symptomatic failure of their root canal filling.**  |
| **Article(s) Synopsis:** |
| **Article 1:** **Study Purpose:** * **The primary objective of this article is to examine and compare gutta percha and silver point filling. This article seeks to determine which root canal filling material is most effective in obliterating the root.**

**Method:** * **This invivo article uses 130 single rooted extracted teeth, immediately fixed in formalin solution. 2 radiographs were taken before procedure.**
* **All canals were were irrigated (with 0.5% sodium hypochlorite and saline solution), dried with paper points, then obturated canals with gutta percha and silver point fillings. Pulp chamber was then filled with polycarboxylate cement then amalgam. Photomicrographs were taken of apical/middle/coronal third and analyzed for best adaptation/adhesion of filling material.**

**Results:** * **Photomicrographs were examined but according to the article, the reading were subjective. As a result, the rating scale was discarded.**
* **Results were deemed “subjective evaluations rather than scientically precise recording”**
* **Silver cones were either filled with ZOE cement or poycarboxylate cement. Silver cones that were sealed with ZOE cement showed “good adaptation” while silver cones sealed with polycarbxylate cement did not adhere well to root canal.**
* **Gutta percha had no adhesive properties and the cement/sealer filled many voids.**

**Conclusion:** * **During processing of the samples, cracks developed in the dentin due to dehydration**
* **Findings in this article confirm that root canal fillings do not completely obturate root canals without sealer**
* **The article revealed that gutta percha shrinks and has poor adaptation to canal walls while silver cones also showed poor adherence and is prone to corrosion.**

**Limitations:*** **Results were “subjective evaluations” thereby reducing the credibility of the results. In addition, the article mentioned that during processing, some of the samples wre dehydrated, which could produced scewed results during the examination of the samples.**

**Article 2:** **Study Purpose:** * **To describe the “unusual” clinical report of degradation ofo endontitic silver point w/ RCT of #28**

**Case Report:** * **52 year old female was referred for symptomatic lower right mandibular premolar that was previously treatetd with a silver point willing and an unknown cement**
* **Patient received treatment with retrograde amalgam that was improperly placed. It was placed too mesical to the apical constriction. However, symptoms improved and no signs of pain or swelling. Periapical radiographs were taken and revealed 5mm of degradation of the silver point filling during the first year and 5 mm during the second year. In total, the silver point filling degraded by 10mm. Since patient wanted to save the tooth, a non-surgical approach was implemented to retrieve the silver point filling and it was later replaced with a post/core.**

**Method:** * **Silver point filling was retrieved and stored in buffer, rinsed, dried with liquid CO2 and then analyzed with SEM and X-Ray microanalysis**

**Results:** * **Low magnification: surface of silver point had deteriorated**
* **High magnification: microbial forms were present**
* **X-Ray Microanalyzer: chlorine and silver**

**Conclusion:** * **Failure and degradation due to multitude of reasons: coronal microleakage, corrosion (galvanic reaction) and occlusion (could have exacerbated degradation)**
* **Combination of infection, microleakage and galvanic degradation**

**Limitations:** * **Since this article is a case report, evidence and credibility is limited and has limited reliability.**
* **Source of degradation/failure of silver point filling was not determined.**
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| **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)[x]  **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[x]  **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[x]  **C** – Consensus, disease oriented evidence, usual practice, expert opinion, or case series for studies of diagnosis, treatment, prevention, or screening |
| **Conclusion(s):** |
| **Silver point fillings were well accepted as an obturation material for endodontic treatment. Evidence shows that despite their wide acceptance in the past, silver point fillings have resulted in several retreatments on endodontically treated teeth. Silver point fillings have caused failure of root canal treatments due to degradation of the material, corrosion, microleakage, and galvonic reactions. Patients previously treated with SPF present with either symptomatic or asymptomatic teeth and/or presence of a periapical radiolucency. The incidence of retreatment of silver point fillings has increased throughout the years, causing clinicians to shift towards more modern root canal materials, such as gutta percha.**  |