Critically Appraised Topic (CAT)

Project Team:
2B-5
Project Team Participants:
D4- Vonte Jackson D3- Theresa Kim Vu D2- Margaret Miller D1- Emily Krieger
Clinical Question:
Are the survival and failure rates of fiber post and cores similar to the survival and failure rates of custom metal post and cores?
PICO Format:
P:
Root canal therapy patients
I:
Custom metal post and cores
C:
fiber post and cores
O:
Survival and failure rate
PICO Formatted Question:
Among root canal patients,how does the survival and failure rates for custom metal post cores compare to fiber post and cores?
Clinical Bottom Line:
Which post material has the best survival and failure rate?
Date(s) of Search:
10/06/20 and 10/13/20
Database(s) Used:
Google Scholar, PubMed
Search Strategy/Keywords:
fiber post and core vs metal post and core survival and failure rate, resin post and core vs metal post and core survival and failure rate, fiber post vs metal post, resin post vs metal post
MESH terms used:
fiber post and core, fiber post, metal post and core, metal post, resin post and core, resin post, survival and failure rate, survival rate, failure rate, survival, failure
Article(s) Cited:
1. Sarkis-Onofre, Rafael et al. “Cast metal vs. glass fibre posts: a randomized controlled trial with up to 3 years of follow up.” Journal of dentistry vol. 42,5 (2014): 582-7. doi:10.1016/j.jdent.2014.02.003

2. Wang, Xiaodong et al. “Evaluation of fiber posts vs metal posts for restoring severely damaged endodontically treated teeth: a systematic review and meta-analysis.” Quintessence international (Berlin, Germany : 1985) vol. 50,1 (2019): 8-20. doi:10.3290/j.qi.a41499

3. Marchionatti, Ana Maria Estivalete et al. “Clinical performance and failure modes of pulpless teeth restored with posts: a systematic review.” Brazilian oral research vol. 31 e64. 3 Jul. 2017, doi:10.1590/1807-3107BOR-2017.vol31.0064

Study Design(s):

1. In this article, the study design was a randomized controlled trial where fifty four participants and seventy two teeth had received a single metal-ceramic crown with either a glass-fibre or cast-metal post. The participants were evaluated during a follow-up period of up to three years and analyzed using Kaplan-Meier statistics. The study was created to compare the survival of glass fibre and cast metal posts in endodontically treated teeth with no remaining coronal wall.

2. The study design of this article was a systematic review and meta-analysis that screened through online and gray literatures up to January 2018. Only randomized controlled trials with follow-up of at least three years were included in the meta-analysis. After articles were selected, the quality of the studies were assessed using the Cochrane Collaboration’s tool. The strength of evidence was assessed using the Grading of Recommendations, Assessment, Development and Evaluations system.

3. This study was a systematic review that searched through PubMed/Medline, Central and ClinicalTrials databases for randomized control trials comparing clinical behavior and failures of at least two types of retainers through July 2016. Only nine studies met the eligibility criteria and a manual search added two more studies, totalizing 11 studies for systematic review. Methodological quality of studies was assessed with the Cochrane Collaboration risk assessment tool.

Reason for Article Selection:

1. This article was selected due to it comparing fiber and metal posts which is what my PICO question asked. This article was also published in 2014 which is fairly recent. The article was also chosen because the study design is a randomized controlled trial which is the second highest level of evidence.

2. This article was selected due to it being a systematic review and meta-analysis and providing high-quality evidence. This article was also published in 2019, so the data is recent. With the high-quality evidence provided by this study, the PICO and clinical question were answered.

3. This article was selected because it is a systematic review that answers the PICO question with high quality evidence. It also analyzed a good number of studies before it reached its conclusion. Full text was available to see which articles were used in the review. The article was also published in 2017 which is quite recent.

Article(s) Synopsis:

1. The article was a randomized control trial that studied the survival of glass fibre and cast metal posts in endodontically treated teeth with no remaining coronal wall. Fifty-four participants and seventy-two teeth were restored with either a glass-fibre or cast-metal post. After following up for three years, the survival rates of glass fibre and cast metal posts were similar.

2. The article was a systematic review and meta-analysis that screened through literature up to January 2018. The analysis selected studies that were only randomized controlled trials with a follow-up of at least three years. Of all the literature, four studies were selected for the study. Using the Grading of Recommendations, Assessment, Development and Evaluations system, there was high quality of evidence to conclude that fiber posts have a significantly higher survival rate than metal posts. There was also moderate quality of evidence to support that there was no difference between the two for success rate.

3. Eleven randomized control trials were selected and researchers evaluated fiber (prefabricated and customized) and metal (prefabricated and cast) posts that had a follow-up range from 6 months to 10 years. At the end of the review, researchers found that survival rates varied from 71 to 100% for fiber posts and 50 to 97.1% for metal posts. The reason why rates varied so much is because there are many factors that affect survival. From the method of cementation to the position of the post, there are too many factors to confidently state that one post is better than the other. Ultimately the survival rates for both types of retainers were similar.

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):

From my research and consultation with Dr. Abere, the specialist involved in this case, it can be concluded that fiber post and cores and metal post and cores have a similar survival and failure rate. Even though the article by Wang, Xiaodong et al was a systematic review and meta-analysis and concluded that fiber posts have a significantly higher survival rate than metal posts, the article only analyzed a total of four studies, which is a very small selection. Full text was also not available for me to analyze the selected studies.

From the other two articles I selected to answer the clinical and PICO question, both articles concluded that fiber post and metal post have similar survival rates. This is because there are many factors that affect survival and failure rates. Survival is influenced not only by clinician experience, but also the integrity of the tooth being restored. Partially, the remaining dentine height, number of walls and ferrule affect the longevity of the restored tooth. Therefore, it cannot be determined which material is better. However, from my discussions with Dr. Abere and performing other outside research, it is concluded that both fiber and metal posts are excellent materials to use to restore endodontically treated teeth. Both materials have high success and survival rates. Ultimately, it is up to the decision of the clinician which kind of material to use.