Do Metal Post–retained Restorations Result in More Root Fractures than Fiber Post–retained Restorations? A Systematic Review and Meta-analysis

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Aim
- To analyze the outcome of clinical trials and cohort studies evaluating the post-retained restorations regarding the incidence rate of root fractures.
- To evaluate the clinical performance of the systems regarding their survival rate.

Materials & Methods
- An online search on clinical studies reporting the incidence of root fractures of restorations retained with fiber-reinforced composite posts or metal posts of endodontically treated teeth.

Inclusion criteria
1) Randomized clinical trials and cohort studies only
2) Studies comparing the incidence of root fractures of metallic & fiber-reinforced posts
3) Studies reported the incidence of root fracture of 1 system
4) Mean/median follow-up time of 5 yrs.

Exclusion
1) Studies from which we were unable to extract data for the outcomes of interest
2) In vitro studies, reviews, and studies with a mean/median of follow-up time of less than 5 yrs.
- Two independent reviewers screened the search results.
- Disagreement between the 2 reviewers was solved either by consensus or a third reviewer.
- Root fracture leading to tooth extraction was considered a catastrophic failure and defined as the primary outcome.
- Non-catastrophic failures were defined as the secondary outcome and included endodontic failures crown dislodgement, post debonding, and post/core fractures.
- The “Cochrane Risk of Bias” was used to assess the quality of the study methodology.

Results
- 14 studies met the inclusion criteria.
- The pooled survival rate was 90% for metal-based posts vs. 83.9% for fiber-reinforced posts. There was a statistically significant heterogeneity among studies.
- The overall incidence rate of root fractures (catastrophic failures) was similar between metal and fiber posts.
- Prefabricated metal posts and carbon fiber posts had a 2-fold increase in the incidence rate of root fractures compared with cast metal posts and glass fiber posts.

Conclusion
- No significant differences for root fracture incidence between metal and fiber posts.
- Clinical studies do not support the indication of fiber-reinforced posts based on a reduction of catastrophic failures.
- The studies included in this review presented a high risk of bias.
- Further well-designed clinical studies are needed.

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