

CLINICAL PRACTICE

Are Fiber Posts Replacing Cast Gold Posts and Cores?

The restoration of endodontically treated teeth often requires the placement of a post to support and retain the final restoration.¹ Metallic posts have most often been used, with the traditional standard being the cast gold post and core.^{1,2} However, the clinical performance of this approach has been questioned with the emergence of new scientific data.¹ A recent clinical study comparing the performance of cast posts and fiber posts reported root fractures in nine percent of the cast post group and none in the fiber post group.¹

Metallic posts are stiffer than the surrounding tooth, creating areas of tension and shear.¹ Furthermore, metallic posts can impart more stress to the root than fiber posts, increasing the probability of vertical root fracture.¹ In contrast, fiber posts have an elastic modulus that is similar to dentin.¹

Fiber posts can be made from glass, quartz, carbon, or zirconia-enriched fiber. They are available in a number of different colors, including translucent, white, and dentin colored, and their light transmission characteristics can range from poor to excellent.¹ The availability of fiber posts with high translucency helps to provide good esthetic results by eliminating show-through and discoloration.¹ Fiber posts can be tapered, double-tapered, parallel, parallel with a tapered end, and serrated.¹ Double-tapered posts are better adapted to the shape of the radicular canal, allowing for a uniform cement thickness at the canal-post interface.¹

Literature Findings

A systematic review on root canal posts for the restoration of root-filled teeth, published by the Cochrane Library, concluded that more randomized controlled trials are needed to confirm the superiority of fiber post restorations.³ In a second, more recent systematic review of studies on the use of fiber posts for the restoration of endodontically treated teeth, retrospective and prospective studies were identified (see [table](#)).⁴ In the five retrospective trials, clinical success rate parameters included retention of the restoration, no objective or radiological sign of endodontic failure, no post dislocation, and no post or root fracture.⁴ The failure rate ranged from 2%–8% for four of the studies (2,590 teeth were assessed in the four studies), with the fifth reporting a 32.2% failure rate (99 teeth assessed).⁴ A ferrule — a 1.5 to 2 mm high vertical band of tooth structure at the gingival aspect of a crown preparation — adds to retention and increases fracture resistance.⁴ A reduction in residual coronal structure is associated with mechanical failure of teeth restored using fiber posts.⁴

Although additional randomized controlled trials are needed to confirm the superiority of fiber-post restorations, fiber posts are emerging as the treatment of choice for endodontically treated teeth.

Studies with a prospective design employed similar clinical success criteria. The overall rate of success was 89.6% with an average restoration survival time of 43.4 months.⁴ Anterior teeth demonstrated the best clinical outcome; the least positive outcome was reported for the mandibular premolars.⁴

Failures that occur in teeth restored using fiber posts are more easily repaired; fractures that occur in teeth with metal posts are more likely to result in tooth extraction.⁴ Prospective and retrospective studies demonstrate that the most common failure associated with fiber posts is post debonding.⁴ Debonding can be repaired by post reluting.⁴

Conclusion

Additional and longer term randomized controlled trials are needed to definitively demonstrate the superiority of fiber posts,³ however fiber posts have been shown to outperform metal posts for the restoration of endodontically treated teeth, both *in vivo* and *in vitro*.^{2,4} 

References

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