

Current Evidence on the Fiber-reinforced Composite Bridges

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Tooth supported or implant-supported fixed dental prostheses (FDPs) are considered a better treatment option for replacing missing teeth. Tooth supported FDPs require preparation of the adjacent intact teeth. In many cases due to the unavailability of adequate bone or the unwillingness of the patient to undergo implant surgery, implant-supported prostheses are not possible.¹

Fiber-reinforced composite resin (FRC) bridges emerged as an alternative treatment modality for the replacement of missing teeth. In these bridges, the abutment teeth can be conserve with minimal preparation and the procedure is performed in a single visit. FRC consists of a plastic matrix reinforced by fine thin fibers.² These bridges are composed of an FRC substructure overlay with resin veneering composite. Furthermore, FRC bridges have improved aesthetics, and are fabricated at lower cost, either directly or indirectly. FRC bridges also provide an alternative treatment option to conventional cast metal resin-bonded bridges. The pontic of the FRC bridge fabricated with acrylic resin, composite materials, porcelain, or even with natural tooth pontic.³

Although many researchers are continuously doing research on FRC bridges but it is efficient, enough to replace other available treatment options to replace missing teeth is yet to be answered. Jokstad et al.⁴ had done the first systematic review on FRC bridges long back in 2005. They identify the scientific documentation of all commercially available fiber-reinforced polymers (FRP) for the production of fixed partial dentures. They found eleven commercial products, which were being used for the FRC bridge, but the evidence found was poor. None of the available products demonstrated good evidence for their usage as a technical solution to replace the missing teeth. Due to a lack of clinical articles, the use of FRP for FDPs is still considered experimental.

Ahmed et al.⁵ had done a systematic review in the year 2017 with the focused question "What is the longevity of FRC fixed partial dentures (FPDs) used to replace one anterior or posterior tooth in patients?" They included nine studies with 592 FRC FPDs in 463 patients with a follow-up of 2 months–8 years. The result showed no significant difference in the survival probability of anterior vs posterior FRC FPDs. The most common failure found was veneering material fracture or delamination. In this study, FRC FPDs demonstrated high overall survival with predictable performance outcomes but still, long-term performance remains unclear.

Martínez et al.¹ in their study with 9 years of follow-up evaluated the clinical usefulness of the new technique to fabricate a direct FRC bridge (FRCB). A total of 21 FRC bridges were performed on 21 patients. The framework design releases the embrasures for adequate interproximal brushing, in an attempt to avoid interproximal caries and periodontal disease. Only one bridge

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debonded at 24 months and three partial adhesive-cohesive veneering composite fractures were observed. A high survival rate of 95.2% was obtained for FRCB during follow-up.

The current evidence available for FRC bridges is quite encouraging and appears to offer a minimally invasive, reliable, cost-efficient, and aesthetic way to restore the missing single teeth. Currently, FRC FDPs cannot be considered temporary, experimental, or short-term treatment modalities. Long-term randomized controlled trials involving FRC FDPs are needed to produce better clarity on their efficacy and clinical acceptance.

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