

## BACKGROUND

Resin-bonded fixed partial dentures (RBFPDs) offer high success rates and failures that are less catastrophic than those seen with conventional FPDs. These dentures are conservative of tooth structure, reduce pulpal morbidity, and use supragingival margins. They are less expensive than implant procedures, have less postoperative morbidity, and offer better esthetics. Patients who are growing and lose an anterior tooth or those who are not good candidates for other more aggressive treatment modalities because of age, medical condition, or finances can obtain long-term replacements using RBFPDs. The downsides of these dentures are compromised esthetics when abutment teeth are highly translucent or interdental spaces are present. These conditions allow the metal color to show through. Patients who have limited interocclusal space, parafunctional habits, or abutment teeth with short clinical crowns are not good candidates for RBFPDs. The use of new, stronger ceramic and nonceramic materials has been accompanied by an increase in the use of RBFPDs with nonmetallic frameworks. Among the materials that can replace metal frameworks in RBFPDs are glass ceramic, zirconia, lithium disilicate, and fiber-reinforced composites (FRCs). Few data exist for nonmetal RBFPDs compared to metal RBFPDs. A systematic review was done to estimate the 5-year success rate for RBFPDs and evaluate whether any significant difference in success rate exists between metal and nonmetal zirconia, ceramic, and FRC framework materials.

## METHODS

The literature search was done in the PubMed, Embase, and Scopus databases between January 1965 and July 2016. Inclusion criteria consisted of human randomized clinical trials and prospective or retrospective cohort studies that were in English and had a follow-up of at least 5 years. Success was defined as the RBFPD remaining in situ and not developing debonding, biological failure, or mechanical failure. Small porcelain chipping that did not affect function and the esthetics of the prosthesis was not considered a failure. A total of 38 studies were eligible for inclusion. This included 2 randomized clinical trials, 15 retrospective studies, and 21 prospective studies. These covered a total of 4218 RBFPDs. Patient age ranged from 13 to 83 years.

## RESULTS

Thirty-one studies were conducted in universities and teaching hospitals and the rest were done in private practice settings. A total of 68.4% of the frameworks were metal, leaving 31.5% as nonmetal. In most cases the RBFPDs were used to replace 1 or 2 missing teeth, but in a few, metal

framework RBFPDs were used to replace multiple missing teeth using more than 2 points or for splinting periodontally compromised teeth. Both anterior and posterior placements were included.

The primary reason for failure was technical complications. The main ones were debonding of the framework loss of retention (82% of cases) and fracture of the retainer of the adhesive framework (15% of cases). Dental caries caused failure in 1.7% and periodontal disease caused it in 0.6% of cases. Other causes included poor esthetics, improper cementation, and pulpal pathology, but these occurred in few cases. Two studies reported that multiple-retainer RBFPDs debonded more often than single-retainer RBFPDs.

The estimated 5-year success rate was 88.18% for metal framework dentures and 84.41% for nonmetal framework dentures. Broken down by material, the success rate for zirconia was 92.07%, that for In-Ceram alumina VITA was 94.26%, and that for FRC was 84.83%. The single study in which lithium disilicate was used had no failures over the 6 years of the study follow-up period. Neither framework material nor clinical setting had a statistically significant effect on the success rate. Single, double, and multiple-retainer RBFPDs showed no statistically significant differences in success rates.

## DISCUSSION

The RBFPDs tended to fail as a result of technical complications more than any other cause. Their estimated success rates were 88.18% for metal framework RBFPDs and 84.41% for nonmetal framework RBFPDs.

### Clinical Significance

The success rates for RBFPDs are comparable to those for conventional FPDs or for implant-supported crowns. Based on these good results, dentists should consider using them more often.

Alraheam IA, Ngoc CN, Wiesen CA, et al: Five-year success rate of resin-bonded fixed partial dentures: A systematic review. *J Esthet Restor Dent* 31:40-50, 2019

Reprints available from IA Alraheam, Dept of Operative Dentistry, Univ of North Carolina, 429 Brauer Campus, Box 7450, Chapel Hill, NC 27599-7450; e-mail: [islammm@live.unc.edu](mailto:islammm@live.unc.edu)