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Success Rate And Survival Of Resin-Bonded Fixed Dental Prostheses In The Anterior Region: A Literature Review

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Abstract

Loss of anterior teeth may affect mastication, phonetics, esthetics, and the patient's quality of life, thereby requiring appropriate rehabilitation. One of the treatment options widely used is resin-bonded fixed dental prosthesis (RBFDP) due to its minimally invasive and conservative nature, as well as its favorable esthetic outcomes. This literature review aims to evaluate the success and survival rates of RBFDPs in the anterior region based on recent scientific publications. This study employed a qualitative descriptive approach through literature searches in PubMed, Google Scholar, ScienceDirect, and Wiley Online Library databases using articles published between 2020 and 2026. Article selection was carried out based on predetermined inclusion and exclusion criteria, and the data were analyzed descriptively. RBFDPs demonstrate high success and survival rates in the anterior region, particularly in ceramic-based restorations and cantilever designs. Factors influencing success include the type of material, retainer design, quality of adhesion, occlusal conditions, patient oral hygiene, and the clinical techniques applied. The most commonly reported complications are debonding and retainer fracture. RBFDPs represent an effective and conservative rehabilitation option capable of providing favorable long-term functional and esthetic outcomes in cases of anterior tooth loss.

Keywords: Resin-Bonded Fixed Dental Prosthesis (RBFDP), Anterior Tooth Loss, Fixed Dental Prosthesis, Survival Rate, Clinical Longevity.

INTRODUCTION

Tooth loss is one of the oral health problems that may affect mastication, phonetics, esthetics, and the patient's quality of life. Tooth loss, particularly in the anterior region, often causes psychological disturbances due to changes in appearance and decreased self-confidence. Therefore, the rehabilitation of missing teeth has become an important aspect of prosthodontics in restoring oral function and esthetics (Mendes et al., 2021).

Rehabilitation of missing teeth can be performed using removable or fixed dental prostheses. Removable dental prostheses offer advantages such as relatively lower cost and ease of cleaning; however, they often cause discomfort and provide less stability during function. In contrast, fixed dental prostheses (FDPs) provide greater comfort, retention, stability, and esthetic outcomes, making them a preferred option for patients undergoing tooth replacement therapy (Shrestha et al., 2021).

Based on their design and retention type, fixed dental prostheses consist of several types, including conventional fixed partial dentures, cantilever bridges, implant-supported prostheses, and resin-bonded fixed dental prostheses (RBFDPs). Conventional fixed partial dentures require full preparation of the abutment teeth to support the pontic, whereas cantilever bridges utilize only a single abutment tooth. In addition, implant-supported prostheses have become a widely used rehabilitation option because they provide high stability and do not require preparation of adjacent teeth, although the procedure is more invasive and involves higher costs (Yamashita et al., 2021).

Resin-bonded fixed dental prostheses (RBFDPs) are a type of minimally invasive fixed dental prosthesis that utilizes resin adhesive systems bonded to the enamel surface of abutment teeth to achieve retention. Compared with conventional bridges, tooth preparation in RBFDPs is more conservative, thereby preserving healthy tooth structure. Consequently, RBFDPs are considered a conservative treatment option, especially for young patients with the loss of a single anterior tooth (Mendes et al., 2021).

The development of RBFDPs began with the introduction of the Rochette bridge in the 1970s, which utilized perforated metal retainers to obtain mechanical retention. This design later evolved into the Maryland bridge, which employed electrolytic etching techniques on the metal surface to produce improved micromechanical retention without perforation. Another development was the Virginia bridge, which used the lost salt crystal technique to enhance resin retention on the retainer surface. Along with advances in dental material technology, contemporary RBFDPs are fabricated not only from metal but also from fiber-reinforced composites, zirconia, alumina, and lithium disilicate, all of which offer superior esthetics and mechanical strength (Habibzadeh et al., 2024).

The use of RBFDPs in the anterior region offers several advantages, including minimal tooth preparation, favorable esthetics, lower cost compared with implant-supported prostheses, and relatively shorter treatment duration. Furthermore, masticatory forces in the anterior region are relatively lower than those in the posterior region, thereby improving the prognosis of restorative success. Previous studies have demonstrated that the survival rate of RBFDPs in the anterior region is relatively high, making them a viable definitive treatment alternative for single anterior tooth loss (Shrestha et al., 2021). Based on these considerations, this literature review aims to discuss the success and survival rates of resin-bonded fixed dental prostheses in the anterior region based on recent scientific studies and publications.

RESEARCH METHODS

This study employed a literature review method with a qualitative descriptive approach to evaluate the success and survival rates of resin-bonded fixed dental prostheses (RBFDPs) in the anterior region. Literature searches were conducted electronically through several scientific databases, including PubMed, Google Scholar, ScienceDirect, and Wiley Online Library. The article search process utilized combinations of the following keywords: “resin-bonded fixed dental prosthesis,” “resin-retained bridge,” “anterior region,” “survival rate,” “longevity,” “clinical success,” and “fixed dental prosthesis.” The selected articles consisted of national and international scientific publications published between 2020 and 2026 and available in either English or Indonesian.

The inclusion criteria of this study were: (1) original research articles, systematic reviews, and clinical studies discussing RBFDPs in the anterior region; (2) articles evaluating the success rate, survival rate, or clinical longevity of RBFDPs; (3) full-text articles; and (4) articles published in indexed scientific journals. The exclusion criteria included: (1) duplicate articles; (2) articles not specifically discussing the anterior region; (3) articles with incomplete data; and (4) editorial articles, opinion papers, or conference abstracts.

Article selection was carried out through several stages, including article identification, screening based on title and abstract, evaluation of article relevance and content, and final selection of articles that met the inclusion criteria. The collected data were then analyzed descriptively by comparing findings related to the types of RBFDPs, materials used, retainer designs, survival rates, and factors influencing the success and longevity of the restorations. The results of the literature analysis were subsequently presented narratively to provide a scientific overview regarding the effectiveness of resin-bonded fixed dental prostheses in the anterior region based on current research evidence.

RESULTS AND DISCUSSION

Table 1. Journal Analysis Results

Author and Year	Title	Result
(Tanoue et al., 2021)	Longevity of resin-bonded fixed partial dentures made of metal alloys: A review of the literature	The survival rate of resin-bonded fixed dental prostheses (RBFDPs) varies considerably depending on the type of metal alloy, adhesive system used, and duration of observation. For instance, the reported 10-year survival rates range from 18% to 88%. This substantial variation indicates that RBFDPs are generally considered reliable restorations; however, they still present a risk of failure when certain clinical procedures or treatment stages are not properly performed.
(Mendes et al., 2021)	Survival Rates of Anterior-Region Resin-Bonded Fixed Dental Prostheses: An Integrative Review	Resin-bonded fixed dental prostheses demonstrate excellent 5-year clinical survival in the anterior region and provide a favorable benefit–risk–cost ratio. To date, there is still no consensus regarding the ideal material for these restorations. Cantilever designs tend to reduce stress on the prosthetic retainer, thereby potentially increasing the longevity of the restoration.
(Drmeddent et al., 2025)	Long-term survival and success of resin-bonded fixed partial dentures with hybrid versus conventional retainers	Ceramic resin-bonded fixed dental prostheses (cRBFDPs) exhibit excellent longevity, with a 5-year success rate of 100% and maintaining a high survival rate of nearly 90% after 10 years. In contrast, metal resin-bonded fixed dental prostheses (mRBFDPs) demonstrate slightly lower survival rates, approximately 93% at 5 years and 75% at 10 years. The clinical success of ceramic restorations is also considered superior to that of metal restorations. In addition, both types of restorations present a relatively low risk of debonding during the period of use.
(Mds & Jensen, 2023)	Resin-bonded fixed dental prosthesis versus implant-supported single crowns in the anterior region	In the RBFDP group, the restoration survival rate reached 82%, with a failure rate of 18%. This indicates that four RBFDPs failed after 3 years and another four failed after 5 years. Meanwhile, the ISSC group demonstrated a higher survival rate of 98%, with a failure rate of only 2%, in which only one case of failure due to

		ceramic fracture was reported after 3 years and no additional failures were observed after 5 years. Among the surviving RBFDPs, 78% showed no complications, whereas 22% experienced complications within 3 to 5 years of service.

Resin-bonded fixed dental prostheses (RBFDPs) are considered one of the treatment options for the rehabilitation of anterior tooth loss because they require minimal tooth preparation, provide favorable esthetic outcomes, and involve relatively lower costs compared with conventional restorations (Beck et al., 2022). Based on various studies, RBFDPs demonstrate satisfactory clinical success and survival rates in the anterior region, particularly within a 5-year observation period. In addition, these restorations offer a favorable benefit–risk–cost ratio, making them a widely used treatment option, especially for young patients (Issn & Res, 2025).

Nevertheless, the survival rate of RBFDPs has been reported to vary considerably depending on several factors, including the type of metal alloy, adhesive system, retainer design, and duration of observation. Some studies have reported 10-year survival rates ranging from 18% to 88%. This variation suggests that RBFDPs are relatively reliable restorations; however, they still carry a risk of failure when clinical and laboratory procedures are not optimally performed. Factors such as cementation technique, moisture control, abutment tooth preparation, and selection of restorative materials are important aspects influencing the long-term success of these restorations (Tanoue et al., 2021).

Restorative materials also play a significant role in the success of RBFDPs. Ceramic resin-bonded fixed partial dentures (cRBFDPs) have demonstrated higher survival rates compared with metal resin-bonded fixed partial dentures (mRBFDPs). In cRBFDPs, the survival rate reached 100% within 5 years and remained nearly 90% after 10 years. In contrast, mRBFDPs demonstrated survival rates of approximately 93% at 5 years, decreasing to around 75% after 10 years (Drmeddent et al., 2025). These findings indicate that ceramic restorations provide superior long-term clinical performance. In addition to enhanced esthetics, ceramic materials exhibit favorable biocompatibility and support a more even distribution of stress on the abutment teeth (Hachami et al., 2025).

Besides their high survival rates, ceramic restorations also demonstrate greater clinical success compared with metal restorations. Although the risk of debonding is relatively low in both materials, it remains the most commonly reported complication associated with RBFDPs. Debonding may be influenced by adhesive quality, enamel surface conditions, and isolation techniques during cementation procedures. Therefore, the use of appropriate adhesive systems and adequate moisture control during clinical procedures is essential to improve restoration success (Jaoued et al., 2024).

The design of the restoration also influences the longevity of RBFDPs. Cantilever designs have been reported to reduce stress on the retainer, thereby improving restoration durability compared with two-retainer designs. In cantilever restorations, occlusal force distribution becomes simpler, reducing the risk of retainer debonding caused by differential movement of the abutment teeth. Consequently, all-ceramic cantilever fixed partial dentures may be considered a definitive treatment option, particularly for adolescent and young adult patients who still possess growth potential (King et al., 2023).

Several studies have also compared RBFDPs with other restorative options such as implant-supported single crowns (ISSCs). In the RBFDP group, the restoration survival rate reached 82%, with a failure rate of 18%, in which several restorations failed after 3 to 5 years of service. Meanwhile, the ISSC group demonstrated a higher survival rate of 98%, with only a 2% failure rate. Nevertheless, most surviving RBFDPs remained free from complications, accounting for approximately 78%, while

the remaining 22% experienced minor complications during the observation period. These findings indicate that RBFDPs still provide satisfactory clinical performance and may serve as a more conservative alternative to implants, particularly for patients with financial limitations or insufficient tissue conditions for implant placement (Mds & Jensen, 2023).

Overall, this literature review demonstrates that RBFDPs are effective and conservative restorative options for replacing missing anterior teeth. Their success and longevity are influenced by multiple factors, including restorative material, prosthesis design, adhesive system, and clinical technique. Ceramic restorations with cantilever designs consistently show the most favorable outcomes across various studies. With proper treatment planning and optimal clinical procedures, RBFDPs can provide satisfactory long-term esthetic and functional outcomes.

CONCLUSIONS

Resin-bonded fixed dental prostheses (RBFDPs) are considered one of the treatment options for the rehabilitation of anterior tooth loss due to their minimally invasive and conservative nature, as well as their favorable esthetic outcomes. Based on the studies reviewed, RBFDPs in the anterior region demonstrate relatively high success and survival rates, particularly in cantilever designs combined with appropriate adhesive techniques. Factors influencing the success and longevity of RBFDPs include restoration design, type of material, quality of adhesion, occlusal conditions, patient oral hygiene, and operator skill. The most commonly reported failures are debonding and retainer fracture; however, these complications are generally manageable without significant loss of tooth structure.

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