



Editorial

Bonded partial restorations: Redefining the balance between conservation and function

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1. Introduction

The philosophy of restorative dentistry has undergone a remarkable transformation over the past few decades. From the era of extensive tooth preparation for mechanical retention, we have now embraced adhesive dentistry as a means to conserve sound tooth structure while achieving superior function and esthetics. Within this continuum, bonded partial restorations (BPRs) have emerged as a pivotal treatment modality, bridging the gap between direct restorations and full-coverage crowns.

Traditionally, extensive caries, fractures, or large defective restorations often compelled clinicians to opt for full crowns. While this approach offered predictable strength and longevity, it frequently compromised sound enamel and dentin, running counter to the principles of minimal intervention dentistry. Bonded partial restorations, e.g. onlays, overlays, endocrowns, and veneers, represent a paradigm shift. By combining adhesive technology with advanced restorative materials, they allow for targeted replacement of compromised structure while preserving healthy tooth tissue.

1.1. Adhesive science as the cornerstone

The success of bonded partial restorations lies in the evolution of adhesive systems. Contemporary dentin bonding agents, combined with effective enamel etching protocols,

have enabled predictable micromechanical and chemical adhesion. This adhesion transforms the restoration-tooth interface into a biomechanically unified complex, redistributing occlusal stresses more harmoniously and thereby reducing the risk of catastrophic failures.^{1,2} Advances in resin-based cements further enhance retention and marginal integrity, providing an additional layer of confidence in their long-term performance.

1.2. Material advancements driving clinical success

The advent of high-strength ceramics such as lithium disilicate, zirconia-reinforced ceramics, and newer resin nanoceramics has expanded the applicability of bonded partial restorations. These materials exhibit excellent fracture resistance, wear compatibility with opposing dentition, and superior esthetics.^{3,4} Moreover, digital workflows and CAD-CAM technology allow for precise design and fabrication, ensuring accuracy in fit and reducing chairside adjustment times. This synergy of adhesive science and restorative material innovation has elevated bonded partial restorations from an alternative option to a mainstream standard of care.

1.3. Clinical considerations and indications

Bonded partial restorations are particularly indicated in situations where tooth preservation is paramount, extensively restored teeth, teeth with weakened cusps, post-endodontically treated teeth, and cases requiring improved esthetics without aggressive preparation. Proper case

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selection, however, remains critical. Adequate enamel availability, control of occlusal forces, and meticulous bonding protocols are prerequisites for predictable outcomes.⁵ Failure to adhere to these principles may compromise the longevity of the restoration.

2. Challenges and Future Perspectives

Despite their advantages, bonded partial restorations are not without limitations. Technique sensitivity, moisture control during bonding, and operator experience greatly influence outcomes. Additionally, the cost implications of ceramic restorations and digital workflows may pose barriers in certain practice settings. Long-term clinical trials are still needed to further validate their superiority over traditional approaches in diverse patient populations.⁶

Looking ahead, bioactive restorative materials and smart adhesives may further revolutionize bonded restorations, offering remineralization potential and improved resistance against secondary caries. The integration of artificial intelligence in treatment planning and digital design could refine the precision of restorations, minimizing human error and enhancing predictability.

3. Conclusion

Bonded partial restorations embody the essence of contemporary conservative dentistry by preserving natural tooth structure, and restoring biomechanics in a minimally invasive manner. They remind us that the future of restorative practice is not merely about replacing what is lost, but about intelligently preserving and reinforcing what remains. As

clinicians and academicians, it is imperative that we continue to explore, refine, and teach this approach, ensuring that our patients benefit from the best that adhesive dentistry has to offer.

4. Conflict of Interest

None.

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