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The Advances Techniques of Nanotechnology in Restorative Dentistry and Characteristics and Future Perspective Dentistry

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Perspective

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INTRODUCTION

Air-abrasive technology has re-emerged in dentistry. The history, characteristics and clinical applications of this approach are reviewed, including advantages and limitations for the removal of stain, enamel, dentin and decay. Air-abrasive technology may be especially suited for use in bonded restorations. Increasing awareness of tooth fracture, both complete and incomplete, as a significant disease entity has led to improved diagnostic techniques. By using compact, easily handled, fiber optic instruments for Tran's illumination and by developing a "predisposition index" to assist in the evaluation of fracture potential, new dimensions have been added in treatment planning, especially for older patients. Prevention of tooth fracture can best be accomplished by utilizing conservative, non-traumatic tooth preparation procedures, understanding predisposing factors, and using full occlusal coverage, circumferentially retained restorations whenever castings are indicated. Effective management of incomplete tooth fracture involves early recognition of the problem, appropriate and timely treatment, and a realistic assessment of the prognosis.

Clinical research of restorative materials is confounded by problems of study designs, length of trials, type of information collected, and costs for trials, despite increasing numbers and considerable development of trials during the past 50 years. This opinion paper aims to discuss advantages and disadvantages of different study designs and outcomes for evaluating survival of dental restorations and to make recommendations for future study designs. Advantages and disadvantages of randomized trials, prospective and retrospective longitudinal studies, practice-based, pragmatic and cohort studies are addressed and discussed. The recommendations of the paper are that clinical trials should have rational control groups, include confounders such as patient risk factors in the data and analysis and should use outcome parameters

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DESCRIPTION

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Biomimetic has emerged as a multi-disciplinary science in several biomedical subjects in recent decades, including biomaterials and dentistry. In restorative dentistry, biomimetic approaches have been applied for a range of applications, such as restoring tooth defects using bio inspired peptides to achieve demineralization, bioactive and biomimetic biomaterials, and tissue engineering for regeneration. Advancements in the modern adhesive restorative materials, understanding of biomaterial–tissue interaction at the nano and micro scale further enhanced the restorative materials' properties (such as color, morphology, and strength) to mimic natural teeth. In addition, the tissue-engineering approaches resulted in regeneration of lost or damaged dental tissues mimicking their natural counterpart. The aim of the present article is to review various biomimetic approaches used to replace lost or damaged dental tissues using restorative biomaterials and tissue-engineering techniques. In addition, tooth structure, and various biomimetic

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properties of dental restorative materials and tissue-engineering scaffold materials. The linear molecules having a methacrylate group at ends are most widely used monomers in resin based dental composites. Chain growth polymerization is responsible for the conversion of monomers to polymers through polymerization in three phases *i.e.* initiation, propagation and termination. Free radicals are formed by photo initiators in case of most of the methacrylate based composites

CONCLUSION

Pediatric restorative dentistry is a dynamic combination of ever-improving materials and tried-and-true techniques. Many aspects of primary teeth restoration have not changed for decades. In 1924, G.V. Black outlined several steps for the preparation of carious permanent teeth to receive an amalgam restoration. These steps have been adopted, with slight modification, for the restoration of primary teeth. Restorative techniques for the primary dentition using amalgam and Stainless Steel Crowns (SSCs) have remained relatively consistent for decades. However, with an increased use of adhesive restorative materials and bonding systems, there has been a shift to more conservative preparations and restorations. Materials such as glass monomers, resin monomer products, and improved resin-based composite systems have been developed, which are having a profound impact on the restoration of primary teeth. Additionally, prefilled zirconia crowns now offer an esthetic alternative to SSCs. Unfortunately, long-term clinical data (*i.e.,* >3 years) regarding many of these newer materials are limited; but even so, many clinicians are successfully using these materials with increasing frequency. Materials of the past, such as amalgam and stainless steel, or move to newer, more esthetic materials that offer advantages such as bonding to tooth structure, fluoride release, improved esthetics, reduction of mercury exposure, and conservation of tooth structure. None of the esthetic materials have the track record and proven durability of amalgam or stainless steel, but when they are placed appropriately, they can provide useful restorations for the life span of the primary tooth.