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Case Report

BioFlx smiles: aesthetic rehabilitation of primary anterior teeth using bioflx crowns - a case report

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ABSTRACT

Restoring primary anterior teeth poses a unique challenge in pediatric dentistry, requiring a balance between function, esthetics, and durability. BioFlx crowns, an innovative alternative to traditional zirconia and composite crowns, offer enhanced flexural strength, biocompatibility, with a consistent appearance that ensures reliable esthetic outcomes. This case report presents the rehabilitation of maxillary primary central and lateral incisors (teeth 51, 52, 61, and 62) using BioFlx crowns in a young child. The treatment approach, including case selection, crown adaptation, and clinical outcomes, is discussed. The patient exhibited significant aesthetic and functional improvement, with high parental satisfaction. BioFlx crowns demonstrate promising potential as a reliable and aesthetically pleasing restorative option for anterior pediatric dental rehabilitation.

Keywords: BioFlx crowns, Primary anterior teeth, Pediatric dental restoration, Aesthetic dentistry

INTRODUCTION

Restoration of primary anterior teeth in pediatric patients plays a crucial role in maintaining function, esthetics, phonetics, and psychological well-being.[1] Early childhood caries (ECC) and traumatic dental injuries are common causes of extensive anterior tooth destruction, necessitating full-coverage restoration.[2] One of the most challenging tasks for pediatric dentists is the restoration of anterior teeth due to factors such as the proximity of pulp to the tooth surface, small tooth size, limited bonding surface area, and relatively thin enamel.[3]

Besides clinical challenges, cost, child behavior, and treatment acceptance play a significant role in determining the success of the procedure.[4]

Over the years, various treatment modalities have been introduced, including stainless steel crowns (SSCs) with composite facings, strip crowns, and zirconia crowns, each with its own advantages and limitations in terms of esthetics, durability, and ease of placement.[5] Recently, BioFlx crowns have emerged as an alternative, offering an optimal balance between strength and esthetics.[6]

Introduced by Dr. Mukul Jaain, founder of Kids-e-Dental, Bioflx crowns are composed of a polymer-based material reinforced with glass fibers, these crowns provide enhanced flexural properties, wear resistance, and natural translucency, making them an attractive choice for anterior restorations.[7] Unlike zirconia crowns, BioFlx crowns allow for easier contouring and adaptation, improving clinical efficiency and patient outcomes.[8] Additionally, these crowns are bisphenol A-glycidyl methacrylate (BIS-GMA) free and more cost-effective than traditional zirconia and composite options, making them an attractive choice, particularly for anterior restorations.

This case report highlights the aesthetic and functional rehabilitation of maxillary primary incisors using BioFlx crowns in pediatric patients. The clinical approach, crown

adaptation technique, and treatment outcomes are discussed, demonstrating the potential of BioFlx crowns in pediatric dental rehabilitation.

CASE REPORT

BioFlx crowns provide a reliable and aesthetic option for restoring severely decayed primary anterior teeth, combining strength and ease of use. This report presents two pediatric cases where BioFlx crowns were used to rehabilitate maxillary primary incisors (teeth 51, 52, 61, and 62), ensuring both functional and aesthetic success.

Case 1

A 4-year-old girl reported to the Department of Pediatric and Preventive Dentistry with complaints of discolored and broken upper front teeth. The parents reported a history of early childhood caries, leading to progressive destruction of the maxillary incisors. The child had no history of pain but exhibited mild discomfort while eating.

Clinical findings

Intraoral examination revealed grossly decayed primary maxillary central and lateral incisors (teeth 51, 52, 61, and 62) with significant structure loss. The surrounding gingiva appeared healthy, and there were no signs of infection or soft tissue pathology. Radiographic examination showed radiolucency involving enamel, dentin, and pulp, indicating the need for pulp therapy followed by crown placement. The child exhibited positive behavior (Frankl's rating 2).

Treatment

A single-sitting pulpectomy was performed, followed by temporary restoration. After one week of follow-up, minimal tooth preparation was done before cementing the BioFlx crowns, restoring both aesthetics and function, as shown in Figure 1.

Case 2

A 5-year-old boy reported to the Department of Pediatric and Preventive Dentistry with similar complaints of broken and discolored upper front teeth. His parents were concerned about esthetics and difficulty in biting food. The child had a history of night-time bottle feeding and frequent snacking, contributing to the development of early childhood caries.

Clinical findings

On examination, extensive carious lesions were observed on the maxillary primary central and lateral incisors (teeth 51, 52, 61, and 62). The teeth showed structural compromise but no associated pain or swelling. Radiographic examination revealed radiolucency involving enamel, dentin, and pulp, confirming the need for pulp therapy and crown placement. The child demonstrated positive behavior (Frankl's rating 3).

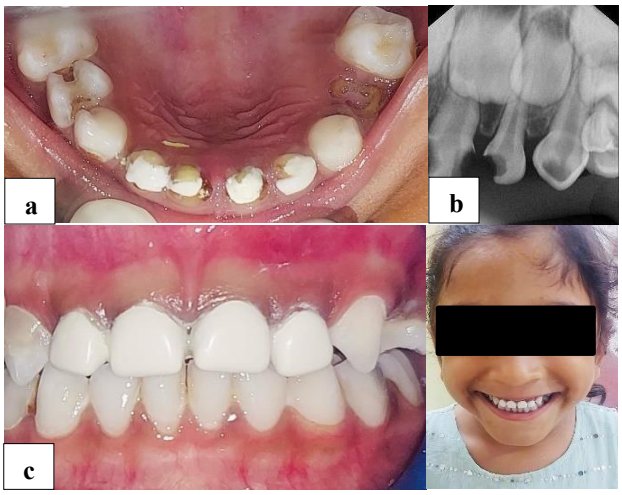

Figure 1: (a) Pre-operative, (b) preoperative radiograph, and (c) post-operative immediately after crown cementation.

Treatment

A single-sitting pulpectomy was performed, followed by temporary restoration. BioFlx crowns were cemented after one week of follow-up, following minimal tooth preparation, ensuring functional and esthetic rehabilitation, as shown in Figure 2.

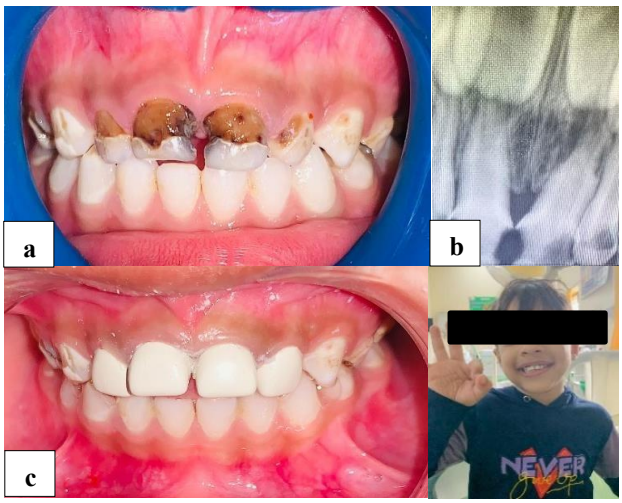

Figure 2: (a) Pre-operative, (b) pre-operative radiograph, and (c) post-operative immediately after crown cementation.

DISCUSSION

Aesthetic restoration of primary teeth has always been a challenge in pediatric dentistry. Over time, full coverage restoration options have been introduced, each with its advantages and limitations. SSCs have long been the gold standard due to their durability and cost-effectiveness, but

they lack esthetic appeal, limiting their use in anterior teeth. This led to the development of esthetic alternatives such as polycarbonate crowns, pre-veneered SSCs, strip crowns, zirconia crowns, and more recently, BioFlx crowns. The emergence of BioFlx crowns has provided an innovative approach to anterior primary teeth restoration by balancing esthetics, function, and ease of placement. Unlike SSCs, which offer excellent strength but poor esthetics, BioFlx crowns maintain a natural tooth-like appearance, making them a preferred choice for parents and clinicians seeking a more visually appealing solution.[9]

Among the commonly used esthetic crowns, zirconia crowns are well-known for their superior esthetic properties and biocompatibility. However, their disadvantages include higher cost, excessive tooth reduction, reduced flexibility, and difficulties in achieving proper retention. Their rigid nature results in reduced adaptability, making placement challenging in cases with limited interocclusal space.[10] In contrast, BioFlx crowns have been designed to address these concerns, offering better adaptability and requiring less tooth preparation, thereby preserving more of the natural structure. Additionally, they can be placed in a single visit, reducing chair time, which is particularly beneficial for uncooperative pediatric patients.[11]

Clinical studies have evaluated the performance of BioFlx crowns in comparison to other available crowns. A case report concluded that BioFlx crowns provided excellent marginal adaptation and sufficient strength for anterior restorations, similar to SSCs but with superior esthetic appeal.[12]

Another study found that BioFlx crowns demonstrated comparable fracture resistance to zirconia crowns while allowing for a more conservative approach in terms of tooth reduction.[13] Furthermore, BioFlx crowns have been noted for their relative cost-effectiveness compared to zirconia crowns, making them a viable alternative in cases where affordability is a concern. Their flexibility offers better retention compared to zirconia, which lacks mechanical adaptability, leading to occasional cases of debonding.[14] In contrast to strip crowns, which are only suitable when at least half to two-thirds of the healthy tooth structure remains, BioFlx crowns provide superior retention and durability, even with significant tooth structure loss.[15] The glass fiber reinforcement in BioFlx crowns ensures better strength and wear resistance, making them a more reliable option than both strip and zirconia crowns, especially when less sound tooth structure is available.

Despite their advantages, BioFlx crowns have certain limitations. Unlike strip crowns, which allow shade customization, BioFlx crowns do not offer multiple shade options, which may limit their ability to blend seamlessly with adjacent natural teeth. Additionally, while their mechanical properties are promising, long-term studies evaluating their durability under occlusal forces and cyclic loading are still needed. Some reports suggest that BioFlx crowns may replace SSCs in pediatric esthetic restorations; however, concerns regarding wear resistance and potential surface degradation over time require further investigation.[16]

In the present case report, the BioFlx crowns demonstrated excellent gingival health, with no signs of inflammation or irritation, and showed positive parental satisfaction regarding both esthetic outcomes and ease of placement. Overall, BioFlx crowns represent a significant advancement in pediatric esthetic dentistry by combining the benefits of different crown types. Their ability to provide esthetics, ease of placement, minimal preparation requirements, and improved adaptability makes them a promising alternative to both stainless steel and zirconia crowns. However, while initial clinical evidence supports their efficacy, further long-term studies are necessary to establish their performance and longevity in pediatric patients.

CONCLUSION

The integration of Bioflx in pediatric restorative dentistry marks a paradigm shift toward biomimetic solutions that prioritize both function and longevity. Our case reports highlight its remarkable adaptability, superior adhesion, and biocompatibility, offering a promising alternative for minimally invasive yet durable restorations. As pediatric dentistry evolves, Bioflx stands at the forefront, bridging the gap between innovation and clinical excellence, ensuring brighter smiles with sustainable materials.

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