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From Wobbly To Sturdy: The Secrets To Stronger Strip Crown Retention - A Case Report

Dr Uma Palaniappan[1] Dr Rangeeth B N [2]

[1.]Post Graduate, Department of Pediatric Dentistry, Thai Moogambigai Dental College and Hospital. Dr MGR Educational and Research Institute, Deemed to be University

[2.] Professor, Department of Pediatric Dentistry, Thai Moogambigai Dental College and Hospital. Dr MGR Educational and Research Institute, Deemed to be University

ABSTRACT

With the ever-growing awareness pertaining to dental esthetics, there is greater emphasis by parents on obtaining satisfactory solutions to unsightly dental problems in their children.

From the perspective of the health of permanent teeth, proper intake of diet, phonetics, space maintenance and esthetic appreciation, the significance of primary teeth cannot be ignored. It is, however, challenging to restore extensively destroyed anterior teeth with restorations that are durable, retentive, as well as esthetic owing to several factors. A strip crown is essentially a crown form filled with a composite that is bonded onto the tooth. Since these composite crowns provide superior esthetics than other forms of anterior coronal coverage restorative options and are easy to repair in case of subsequent chip or fracture, they are extremely popular for restoring primary anterior teeth. Despite the technique being used for over two decades, longitudinal clinical data on the longevity of these crowns are limited and there is a definite paucity of literature concerning the clinical success based on the extent of surface area used for adhesion and therefore in this current case report, retention was increased by giving retentive points on the buccal and palatal aspect thereby increasing the macro mechanical retention along with micro mechanical retention.

KeyWords : strip crown, aesthetics, retention, early childhood caries, resin composite.

INTRODUCTION

The journey of restoring severely decayed primary teeth in children has evolved significantly over the decades, posing both challenges and opportunities for pediatric dentists. Historically, the focus shifted from extraction to restoration, driven by advancements in dental materials and techniques that introduced a multitude of aesthetic treatment modalities. Decades ago, stainless steel crowns were the go-to for severely decayed primary molars due to their durability and ease of placement in posterior teeth. However, their aesthetic limitations and inability to address anterior teeth prompted the need for more visually appealing solutions.[(1)]

Enter the composite resin strip crown, pioneered in 1979 by Webber and colleagues. Designed specifically for primary incisors, these crowns offered a breakthrough in aesthetic restoration. They became indispensable for cases involving extensive decay, fractures, discoloration, or as protective covers post-pulp therapy. Their popularity soared due to their ability to mimic the natural appearance of teeth closely, enhancing both function and aesthetics.[2]Despite their advantages, the journey to mastering composite resin strip crowns hasn't been without challenges. Clinical efficacy hinges on meticulous technique—every step, from patient selection to moisture control, tooth preparation, adhesive application, and composite resin placement, demands precision. This technical sensitivity underscores why only 21% of general dentists compared to 73% of pediatric dentists perform strip crown procedures.[3]

Moreover, the scarcity of extensive clinical data on the longevity of composite resin strip crowns underscores the ongoing learning curve. While numerous case reports and procedural guidelines exist, robust longitudinal studies are lacking, highlighting the need for further research into their durability and effectiveness over time. The procedure itself involves comprehensive tooth reduction, meticulous caries removal, and precise selection of a celluloid crown form Their ability to restore not just function but also the smile and confidence of young patients underscores their transformative impact in pediatric dentistry. In this case report we have tried to improve the retentive capacity of strip crowns by placing retentive pits.

CASE REPORT

A 6 year old male child reported to the Out Patient Unit of the Department of Pediatric Dentistry with the chief complaint of pain in the upper front region for nearly 10 days with the parent reporting the presence of a discoloration being present for a few months towards the midline of the teeth (**Figure 1)**. Following the clinical examination and radiological investigation a diagnosis of Chronic irreversible pulpitis of Maxillary upper right and left primary central incisors was concluded and pulpectomy followed by placement of esthetic restoration was planned.

Following clinical protocols and behavior management technique protocols, pulpectomy was completed in 51 and 61, with placement of Strip crowns following selection of appropriate shade matching the child's dentition. The conventional technique of preparation was planned with a slight modification where retentive pits were added on the tooth surface both labially and palatally with round bur (Mani, BR-41). The clinical procedures were done under 3.5X magnification loupes for a more conservative approach. To elaborate the clinical steps followed in placing a strip crown followed were infiltration of local anesthesia was given followed by isolation of the tooth. Tooth preparation was done to allow the bulk of resin in the final crown form. The length of the crown was reduced incisally using a tapered diamond bur of 1-1.5 mm. Proximally 0.5mm was reduced and a knife edge margin was created. In addition retentive pits were created both labially and palatally to provide macro mechanical retention along with micro mechanical retention (**Figure 2)**. Appropriate size of the crown form was chosen by measuring the mesio distal distance of the tooth. Pedo shade composite was chosen and was filled into the celluloid crown form. A vent was created at the incisal edge for the excess resin to flow out. Then the crown form(s) with composite resin was firmly seated on to the tooth and cured. After curing the celluloid crown form was stripped out of the tooth and was smoothened and polished (**Figure 3)**.Patient was where the strip crown remained intact even as the permanent teeth began to erupt. Ultimately, the primary tooth and strip crown were extracted to allow the permanent maxillary central incisors to emerge properly (Figure 5).

DISCUSSION

Early childhood caries is becoming more common nowadays which leads to pulpal involvement and gross destruction of the teeth. This mostly involves the maxillary central incisors. Stainless steel crowns have been the gold standard full coverage restorative treatment in pediatric dentistry but always lack in aesthetics. When it comes to maxillary incisors parents as well as the children are very much concerned about the aesthetics for which strip crowns serves the purpose. [4]

Kupietzky A et al stated following advantages of strip crowns. They are simple to fit and trim, removal is always fast and easier. Strip crown also matches the natural contour of the tooth they also possess easy shade control quality with composite. They are superior aesthetically, functionally and economically which matches both the parent and child's comfort and when fractured it can be easily repaired.[5] Few authors have proposed modifications in strip crown to improve its longevity and stability. ***Kenny et al (1986)*** introduced the composite resin short post, or "mushroom undercut" in the dentin, to aid in the retention of the crown.[6] ***Grosso et al (1987)*** used a composite resin short post in the pulpal chamber of an anterior tooth that had received a pulpectomy to improve the retention of strip crown.[7] ***Judd and colleagues (1990)*** conducted a prospective clinical study with a 1-year follow-up. The study reported a 100% retention rate of the composite resin strip crown in a sample of 92 teeth.[8] ***Margolis et al (2002)*** introduced the sandwich technique in which RMGIC was coated on the dentin before the placement of strip crown.[9] Considering the other modifications done by various other authors, in this case we have added retentive pits to improve the macro mechanical retention along with micro mechanical retention for better stability and longevity. Strip crowns according to various authors have excellent aesthetic outcome and has proved to be highly cost effective. Clinical chair side time in placement of strip crown is also less when compared to that of that zirconia crowns. Overall success rate and parental satisfaction is said to be 80%. [10]

CONCLUSION

In conclusion, strip crowns have proven to be a valuable tool in pediatric dentistry, offering reliable restoration of primary teeth affected by extensive caries or trauma. Their ease of placement, durability, and ability to preserve tooth structure make them a preferred choice for many clinicians. By effectively restoring form and function, strip crowns contribute to the overall oral health of young patients, promoting chewing ability, speech development, and aesthetic appearance. However, careful attention to technique and regular monitoring are essential to ensure optimal retention and longevity. With proper care and maintenance, strip crowns continue to be a beneficial treatment option, supporting the dental health and well-being of children.

Figure 1: Pre-Operative clinical examination showing carious lesions in 51 and 61

Figure 2: Clinical procedure which includes retentive pits to increase the macro mechanical retention.

Figure 3: post operative image after finishing and polishing

Figure 4: follow up - 6 months

Figure 5: follow up after 1 year 8 months – Eruption of permanent teeth was observed

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