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NUSMILE ZIRCONIA CROWNS: PEDODONTIST PERCEPTION TO RESTORE ESTHETIC SMILES

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Abstract
For a pediatric dentist restoring the esthetic smiles is an immense challenge, much of the literature highlights on class V restorations and composite strip crowns. This article presents an overview on Nusmile ZR crowns and its clinical implications in children with esthetic disturbances.
Key words: Nusmile ZR crowns, Nusmile try in crowns, Pedo zirconia crowns, Full coronal restorations.

INTRODUCTION

Pediatric esthetic dentistry is a branch that deals with maintenance and enhancement of beauty of the mouth of infants and children through adolescene, including those with special health care needs.[1]

They are number of conditions leading to esthetically unaccepted dentition like Dental caries, early loss of tooth, Malocclusion, Discoloration, Traumatic injuries, and Abnormality in shape.

The major disturbance in esthetics is caused by Early Childhood Caries (ECC). Mostly effected in preschool children which has wide prevalence in undeveloped and socioeconomic

groups of developed countries. Published data shows 44% prevalence in 8 to 48-months children in Indian population.[2]

If untreated ECC has a major effect on Psychosocial, Behavioral, and Nutritional implications and affects the quality of life of child.

In today's era we have a wide of variety of treatment options to treat such esthetic disturbance's with Composite resins, Class V preparations, Open-faced stainless-steel crowns, Strip crowns, Pedo pearl crowns, Pedo jacket crowns and Pedo Zirconia crowns.

Pedo Zirconia crowns like NUSMILE are new in market, developed in Houston, Texas, and have perfect balance of art and science. They are made up of Zirconia ceramic which replicates natural esthetics, high durability and easy placement.

This case report illustrates the use of NUSMILE ZIRCONIA PEDO CROWNS in maintaining the aesthetic equilibrium.

Case report

A 4-year-old child was reported to our Department of Pedodontics And Preventive Dentistry with a frequent complain of lingering pain in maxillary incisors and left maxillary first deciduous molar from a year.

On clinical examination we notice stage 3 type of ECC with deep labiolingual carious formation and mesioocclusal caries on the left maxillary first deciduous molar also GIC filling was done on maxillary right lateral incisor and a preexisting SSC on right maxillary first deciduous molar as shown in **figure1**.

Figure 1: Preoperative view

Teeth showed no response to cold and no visible swelling or sinus tract was found. On radiographic examination shows caries extending in dental pulp in incisors and secondary caries was noted on right lateral incisor, mesial caries extending towards pulp was noted in the left maxillary deciduous molar. On clinical and radiographic examination, the teeth were diagnosed as chronic irreversible pulpitis. Treatment procedure was planned to perform pulpectomies on all teeth followed by placement of Nusmile Zr crowns on the incisors and Nusmile stainless steel crown on the left molar.

After obtaining the parental consent, local anesthesia was given and pulpectomies was performed on the maxillary incisors and molars according to the protocol followed by Glass Ionomer Cement restoration. In the next visit we decided to restore the primary incisors 51, 52, 61&62 with a preformed NUSMILE ZIRCONIA CROWNS and 64 with Nusmile Stainless Steels Crowns.

TECHNIQUE

CROWN SELECTION

The selection of appropriate Try in crown was performed prior to initiating the tooth preparation by measuring the mesiodistal dimension of incisors on study model. In this case we selected try in crown size 2 for all incisors.

TOOTH PREPARATION

The single most important aspect of mastering the use of Nusmile ZR Crowns is proper preparation of tooth. Adequate preparation of the tooth will significantly improve the esthetics and crown fit and will save the operating time. The tooth must be prepared in such a way that the crown fits the tooth passively without applying any pressure during seating. Nusmile ZR crowns may require greater amount of circumferential tooth reduction (approximately 20%more) than for traditional SSC's. As in many cases of ECC, appropriate pulp therapy must be performed prior to tooth preparation.

1. Reduce the incisal length by approximately 1.5-2mm. open the proximal contacts which allows the selected try in crown to fit passively.

   The incisors should be reduced circumferentially (labial & lingual) by approximately 20-30% or 1.5-1.25mmas necessary. The reduction should follow on all planes of tooth with slightly converging incisally and follows the natural contours of existing clinical crown.

   These steps are performed by a thin course tapered carbide burs (330); a coarse football diamond bur (5368-023) is used to reduce the incisal areas and for prominent lingual surfaces. The coarse diamond taper bur (5855-012) is used for supragingival tooth reduction

2. Subgingival margin should be carefully extended and redefined to a feather edge by thin taper diamond bur (6852-012). The margin shouldn't have any undercuts or ledges. The reduction is done approximately 1-2mm subgingivally on all surfaces which ensures healthy gingival adaptation and maximizes the retention.

3. Finishing the preparation, all the line and point angles are removed so that all surfaces of prepared incisors are slightly rounded by fine grit bur (134F-014). Check for sufficient occlusal clearance with opposing teeth and no undercuts subgingivally.

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Try in the Crowns

Use of try in crowns to avoid contamination with blood or saliva of Nusmile ZR Crown's prepared internal surface. If contaminated the crowns must be cleaned with Ivoclean prior to cementation.

The try in crowns should fit passively without distorting the gingival tissues. In case of multiple teeth all the crowns should be tried together or quadrant wise to ensure that they fit passively (**figure2**).

Figure 2: Showing passive fit Nusmile Try-in Crown and actively fit Nusmile ZR crown

Seating the crowns

All the prepared incisor surfaces should be cleaned of any saliva, blood, or debris. If any gingival bleeding is persistent application of haemostatic agent is recommended.

Resin Modified Glass Ionomer Cement (FujiCEM2) is the recommended to seat the Nusmile Crowns. For proper positioning seat the crowns quadrant wise (central and lateral) and hold in position until the cement sets. After the cement sets allow the light curing to set dual cure cement. And last the check the occlusion after fit as shown in **figure3&4**.

Figure 3: Nusmile try in check for proper occlusion

Figure 4: Postoperative view of Nusmile ZR Crowns

Discussion

The first use of preformed esthetic primary restorations began in earnest in the early 1990s with the advent of pre-veneered stainless-steel crowns. Nusmile was established by CEO Diane Johnson Krueger in Houston, Texas in 1991as a division of orthodontic technologies. This company invented and introduced one of world's first prefabricated esthetic pediatric crowns called NUSMILE signature Pre-veneered crowns.

Nusmile crowns have been extensively used in primary teeth to restore teeth with multisurface caries involvement, discoloration, traumatic injuries, after pulp therapy to maintain esthetics and quality of life of the child.

Various studies in the form of clinical trials, retrospective studies, and reviews conducted over a period have recognized the efficiency of Zirconia crowns as semi-permanent restoration for primary teeth. But there is very less literature support on physical properties of the crowns[3].

In a study by kern[6], et al shows that saliva contamination affects the bonding ability of zirconia crown, and the contamination is easily removed by common cleaning procedures. Nusmile try in crowns ensure optimal cement retention to zirconia, saves valuable chair time.

The Nusmile ZR is the only pediatric crowns that wear comparable to natural enamel against natural enamel.[5] the fracture resistance of Nusmile ZR after artificial ageing and cyclic fatigue simulating more than 4 years use in child's mouth. So, we can trust the survival of these crowns till primary tooth exfoliation.[5]

In randomized clinical trial conducted by Walia et al., compared restorative failures of composite strip crowns, preveneered SSCs and prefabricated primary Zirconia crowns in carious and traumatized primary teeth. The retention rate was highest for Zirconia crowns (100%) followed by preveneered SSC's (95%) and strip crowns showed the least (78%).[4]

In this case report we have use Nusmile ZR Crowns which have good reliability and offers high end esthetics, superior durability and easy placement .It is expected that in near future

the prefabricated Nusmile ZR Crowns could be an easy, restorative option to traditional Open faced SSC's and Composite Strip crowns in restoring esthetics in preschool children.

Conclusion

Nusmile ZR crowns have a perfect balance in superior esthetics and a good science-based design. This is quick and easy to use, and has high polished surfaces which improves the biocompatibility with the tissues and has high fracture resistance, when compared with other commercially available zirconia crowns in the market.

With all available clinical data, Nusmile ZR crowns are the best available zirconia crowns to restore esthetics disturbances.

Clinical signification

As there is very less literature on zirconia crowns use in pediatric dentistry, the current case report was done to sum up the data on clinical execution and consequently helping the clinicians in dynamic cycle of when and where the utilization the zirconia crowns is suitable in Pediatric Dentistry.

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