

# Anterior dental esthetics in primary teeth

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## Abstract

Esthetic restorations for the anterior primary dentition are discussed. Varied primary crowns--stainless steel, composite strip crowns, preformed ceramo-base metal crowns, and stainless steel crowns with composite facings--are evaluated as to their advantages and disadvantages. The repair of grossly decayed teeth, for example, nursing bottle caries, using complete endodontic therapy and stress relieved posts is described. Alternative esthetic anterior restorations, fixed and removable, are evaluated as to their efficacy.

## Keywords

Anterior Dental, Esthetics, Smile, Children

## 1. Introduction

Esthetic restoration of primary anterior teeth can be especially challenging due to the small size of the teeth, close proximity of pulp to tooth surface, relatively thin enamel and surface area for bonding, issues related to child behavior and finally cost of the treatment.[1,2] Apart from a compromise in esthetics, dental destruction may also lead to development of parafunctional habits like tongue thrusting and speech problems, psychological problems, reduced masticatory efficiency and loss of vertical dimension of occlusion. [3 ]Hence it is important to restore crowns destroyed by caries to preserve the integrity of primary dentition until its exfoliation and eruption of permanent teeth.[4,5]

In the modern civilized cosmetically conscious world, well contoured and well aligned white teeth set the standard for beauty. Such teeth are not only considered attractive, but are also indicative of nutritional health, self esteem, hygienic pride and economic status.[1] With the growing awareness of the esthetic options available, there is a greater demand for solutions to unsightly problems such as nursing bottle caries, malformed and discolored teeth, hypoplastic defects, tooth fractures and bruxism in children.

Anterior teeth fracture, as a result of traumatic injuries, frequently occurs in dentistry and presents a special challenge to paediatric dentist. Premature loss of primary incisors may affect the speech by interfering with the pronunciation of consonants and labial sounds, decreased masticatory efficiency, abnormal tongue habits and potential subsequent malocclusion. The child may also suffer from psychological problems if aesthetics is hampered[1]. Because of reduced coronal tooth structure, direct adhesive restorative procedures do not always give satisfactory results. In the past, the most expedient treatment was to remove the involved teeth. This treatment was justified on the basis that the permanent teeth would eventually replace the extracted ones. However, the importance of preserving the integrity of primary dentition until the appropriate exfoliation time is well recognized. The consequences of premature loss of primary teeth are well known namely the loss of vertical dimension of occlusion, tongue thrusting and mouth breathing habits, which can be sources of future malocclusion. In cases of severe loss of tooth structure intra canal posts became mandatory[6,7]. The various root canal posts used in paediatric dentistry are orthodontic thread in the shape of alpha or gamma<sub>2</sub>, the metallic posts with macro

retention, composites posts biological restoration and the fibreglass post.[7,8] Recent development in restorative materials, placement techniques, and adhesive protocols facilitates these restorations. However these procedures turn out to be expensive, technique sensitive and also require expertise of the operator. The expression “biological restoration” was coined by Santos and Bianchi, in 1991[5]. A biological restoration meets up to the aesthetic and structural standards of natural teeth. Proper reconstruction of extensively damaged teeth can be achieved through the fragment reattachment procedure known as “Biological Restoration.” They provide natural posts and crowns which can fit into the treated root stumps of the individual and replace the coronal portion aesthetically. The first paper reporting the use of fragments of extracted teeth as dental restorative materials was published in 1964 by Chosak and Eidelman. Thereafter, several other reports have demonstrated the advantages of this technique, such as favourable aesthetics, resulting from enamel's natural surface smoothness, anatomic contouring and colour match, functional and masticatory effectiveness, preservation of sound tooth structure, prevention of physiological wear, and no need of complex material resources.[1,3,6,7,8,9] Figure 1, 2

The principle goal of paediatric restorative dentistry is to restore the damaged teeth to its normal function as well as to retain its aesthetic. In the past, the only treatment option for pulpally involved primary teeth would have been to extract the teeth and replace them with prosthetic substitutes, until the permanent teeth erupted. However, the availability of natural crowns and roots would allow the use of biologic restorations to preserve the integrity of patient's natural dentition. Fragment re-attachment using natural teeth is a technique known as biological restoration. Although the technique is simple, it requires professional expertise to prepare and adapt the natural crowns and intra-canal posts.[10,11] Biological restorations not only mimic the missing part of the oral structures, but are also bio-functional. The advantages of using biological restorations are the length of each appointment is reduced because natural teeth are prepared previously; the technique eliminates laboratory processing and is economical.[12] The technique is simple, allows the preservation of sound tooth structure and provides excellent aesthetics compared to composite resins and stainless steel crowns, especially regarding translucency. Clinical chair time for fragment bonding procedures is relatively short, which is very advantageous when treating paediatric patients. Resin composite restorations do not present these advantages and can allow staining and plaque formation on their surfaces[13,14].

Disadvantages of the biological restoration technique include the difficulty in obtaining teeth with the required coronal dimensions and characteristics, problems inherent to indirect restorations and matching fragment colour with tooth remnant colour. Also, having fragments from other people's teeth in their mouth is not a pleasant idea for some patients and many of them refuse to receive this treatment. However,

all these factors are not contraindications of the technique[1,4,7]. It is important that the parents are informed that the tooth fragments used for biological restoration are previously submitted to a rigorous sterilization process that completely eliminates any risk of contamination or disease transmission to the child receiving the fragment. Presently, secure methods of sterilization and storage are available to ensure the safety of teeth or tooth fragments coming from tooth banks. Several materials have been used for bonding dental fragments to cavities, e.g., adhesive systems, composite resins, glass ionomer cements and dual-cure resin cements. The association between “Biological Crowns and Posts” offers excellent aesthetic, functional, and psychosocial results, which justifies the use of this technique to achieve the morpho functional recovery of extensively damaged teeth. In the present case, the use of biologic restoration with the natural roots and crown resulted in clinical success as well as recovered function and aesthetics.[15,16,17]

The biologic restoration is a promising alternative to prosthodontic restoration for primary teeth severely destroyed due to trauma or caries. Also, the technique eliminates high costs associated with other restorative techniques for deciduous anterior teeth, and provides highly functional and aesthetic outcomes.[1,7,9,18,19]

There are several difficulties in designing clinical studies to evaluate restorative options of primary incisors. One need only consider the population of patients that require these restorations to develop a list of obstacles. First, children who exhibit dental caries in the primary incisors are generally very young. Early childhood caries or baby bottle tooth decay is usually seen in the 18- to 36-month-old child, although it can be seen even younger.[1] These children, due to their young age and lack of cognitive abilities, are usually very uncooperative for dental treatment, and their behavior plays a big factor in restoration. Because these children are usually candidates for sedation, general anesthesia, or immobilization, few clinicians want to consider placing these children into an “experimental” situation where failure of a restoration can mean a significant problem for replacement.[2] Even if the clinician were willing to do this, many parents will not be willing, especially if failure of the “experimental” restoration might require additional sedation.[20]

The purpose of this article is to review the various esthetic options available for restoring the primary incisors and enhance the clinician's ability to make the best choice of selection for each individual situation.

#### *A. Restoration of Severely Decayed Tooth*

1. Crown build up using resin composite short post technique

Resin composites used directly or indirectly has been an excellent choice for severely carious teeth due to their adhesive bonding and esthetic appearance. The technique involves placement of light cured resin composite in the root canal and crown region in several steps where the cervical third of root is left unobturated. This eventually forms the superstructure of the post. During next visit, celluloid crowns will be used to build up the teeth.

This procedure reduces operator chairtime and they do not require a layer of opaque material as used in metal posts. The celluloid crown is filled with same material used in fabricating the post, hence it produces a glossy finish thereby minimizing polishing.[11]

2. Indirect composite resin crowns reinforced with a fibre glass post

With the introduction of new adhesive systems and restorative materials, a new approach for treating severely mutilated anterior teeth is explained and documented by clinical cases, where fiber core posts are introduced into the root canals of primary incisors for a distance of 2 to 3 mm. It is retained in place by flowable composite, then the coronal part is reconstructed by a strip crown to restore the crown form. A laboratory testing of the fracture load resistance of the restored teeth proved that this technique significantly improved the fracture load resistance of composite celluloid crowns, making it a valuable procedure to consider when the coronal tooth structure is not enough to support and retain a composite celluloid strip crown.[13]

3. Biological posts and crowns

Biological restoration was introduced by Santos & Bianchi in 1991. Here, used teeth from the Human Tooth Bank are used as natural posts & crowns.

The selected tooth from the tooth bank is reshaped, roots strengthened by retro filling with flowable composites and autoclaved for 30min at 121 degree centigrade and 15 lbs pressure before cementation .[5]The natural crowns offer esthetics as well as preserves natural teeth colour. The enamel also has physiologic wear and offer superficial smoothness and cervical adaptation is compatible with those of surrounding teeth. The length of each appointment is reduced because natural teeth are prepared previously. Further more, the technique eliminates laboratory processing and is economical.[5]

Although the technique is simple, it requires professional expertise to prepare and adapt the natural crowns and intracanal posts. Studies have shown that it is cost effective, clinician friendly, less technique sensitive and esthetic alternative to commercially available restorative materials[7,8,9].

Other factors of concern while using biologic restoration is that Universal protocol of consent, storage and sterilization should be followed in the human tooth bank. Figure 3-14

Collected samples should be scaled, polished and freed of soft tissues and periodontal remnants. Pulpas have to be removed and complete biological preparation is to be done. Teeth are then stored at 4degree centigrade in HBSS with donor identification till the time of its use.[14]

4. Orthodontic wires shaped as Greek alphabets like alpha, omega, theta used as intracanal retainers

The core build-ups are done directly or indirectly over these wires. Mortada and King(2004) proposed this technique involving the placement of an omega shaped stainless steel wire extension into the entrance of the root canal prior to restoring the crown with an internal compomer core and an external composite restoration.[2] The modified omega loop

is an efficient technique for the restoration of the severely damaged anterior teeth. The ease of manipulation and short chair-side time are further advantages of the technique.[12]

### B. Full coronal restorations

Esthetic-type anterior resin crowns have been used in the general pediatric population for many years, but unfortunately, much less so in the special needs population. This article presents the case of a special needs patient who received anterior resin crowns, outlining the steps taken to create beautiful and long-lasting esthetic restorations.[1,7,8,9]

Full coronal restorations of carious primary incisors are indicated when caries are present on multiple surfaces; the incisal edge is involved; there is extensive cervical decalcification; pulpal therapy is indicated; and caries are minor but the patient's oral hygiene is very poor, resulting in a high caries risk. In selected cases, permanent incisors have also been beautifully restored and esthetic results achieved without the need for an impression, laboratory models or follow-up for insertion of crowns or veneers.[1,3,7,9]

Anterior resin crowns are an attractive first choice for many clinicians, but they are very technique-sensitive. Hemorrhage or saliva contamination on the tooth will interfere with the bond, causing the restoration not to adhere and to subsequently fail. Thorough and complete rubber dam isolation of the teeth is necessary to create an ideal bonding environment for placement of successful long-term restorations. The following clinical steps and photographs are intended as a guide to restoring teeth with anterior resin crowns. Figure 15-37

Indications for this include:

- Caries present on multiple surface.
- Extensive cervical decalcification
- Anteriors that have received pulp therapy
- Anteriors that have fractured and lost most of the tooth structure
- Anterior teeth with multiple hypoplastic defects or developmental disturbances
- Discolored teeth that are aesthetically unpleasing
- High risk patients where the oral hygiene is poor but caries is minimal.

The child's behavior makes moisture control difficult in placing class III restorations[ 4]

The full coronal restoration can be discussed under;

a.Bonded crowns

b.Cemented crowns

#### A. Bonded crowns

Strip crowns :

The bonded resin composite strip crown is perhaps the most esthetic of all the restorations available to the clinician for the treatment of severely decayed primary incisors. However, strip crowns are also the most technique-sensitive and may be difficult to place.

Composite strip crowns are composite filled celluloid crowns forms. They have become a popular method of restoring primary anterior teeth because they provide superior aesthetics as compared to other forms of anterior tooth coverage. Composite strip crowns rely on dentin and

enamel adhesion for retention. Therefore the lack of tooth structure, the presence of moisture or hemorrhage contributes to compromised retention. They are less resistant to wear and fracture more readily than other anterior full coverage restorations. A 2002 study by Tate, et al. found that composite strip crowns had a failure rate of 51%, compared to an 8% failure rate of stainless steel crowns.

These are commonly used Crown forms filled with composite & bonded on the tooth. The benefits of these crowns include

- Parent/patient pleasing
- Ideal for ankylosed tooth build –ups
- Simple to fit & trim
- Removal is fast & easy
- Easily matches natural dentition
- Leaves smooth shiny surface
- Easy shade control with composite
- Superior esthetic quality
- Ideal for photo cure
- Crystal clear and thin
- Large selection of size
- Easy to repair

However it is technique sensitive, adequate tooth structure is required and any lapses in patient selection, moisture and hemorrhage control, tooth preparation and resin placement can lead to failure[9].

Polycarbonate Crowns:

These are heat molded acrylic resin used to restore primary anterior teeth. It is esthetic than SSC, easy to trim and can be adjusted with pliers. These crowns do not resist strong abrasive forces thus leading to occasional fracture, hence it is contraindicated in cases of Severe bruxism and deep bite[8].

Pedo jacket

It is a tooth colored copolyester material which is filled with resin and left on tooth after polymerization instead of being removed. It does not split, stain or crack. Crowns can be easily trimmed with scissors.

Dis-advantage :

- Only one size is available.
- Cannot be trimmed with bur

Glastech

Made of Artglass, which is a polymer glass. It gives a natural feel, bondability and kindness associated with composite but the esthetics and longevity of porcelain. It is Color stable, wear of polymer glass is similar to enamel, kind to opposing dentition and is plaque resistant. The unique filler materials of microglass and silica are proposed to provide greater durability and esthetics than strip crowns.

New millenium

These crowns are made up of Lab enhanced composite resin material. No long term studies are available regarding these crowns.

*B. Cemented crowns*

Stainless Steel Crowns

Stainless steel crowns are considered to be the most durable, economical and reliable for restoring severely carious and fractured primary incisors.

They are easy to place, fracture proof, wear resistant and attached firmly to tooth until exfoliation. However there is a compromise in esthetics due to the unsightly silver metallic appearance.<sup>5</sup>

Modifications of Stainless Steel Crowns

*a. Facial cut out Stainless steel crowns*

This involves placement of composite material in a labial fenestration of SSC. Although there is an improvement in the appearance, the technique is time consuming and metal margins are still visible. Clinicians even face problems to control hemorrhage during application of composite facing.[5]

*b. Veneered Stainless steel crowns*

Here the composite resins and thermoplastics are bonded to the metal. This type of veneered crown was developed to serve as a convenient, durable, reliable, and esthetic solution to the difficult challenge of restoring severely carious primary incisors. Various commercially available veneered SSCs include Cheng crowns, Kinder crowns, Nu-smile and Whiter biter, pedo compu crowns and Dura crowns.[5]

*Cheng Crowns*

Cheng Crowns made their public debut in 1987. These are Stainless steel pediatric anterior crowns faced with a high quality composite, mesh-based with a light cured composite. It presents a unique solution for natural-looking Stain-resistant Crowns.

It is available for the right and left central and lateral as well as cuspids.

Most crown procedures can be completed in one patient visit and with less patient discomfort.[6] It is available in short and regular lengths and sizes suitable for centrals, lateral and cuspids. They can undergo heat sterilization without significant effect on their bond strength and color. Disadvantages of all veneered crowns are fracture of veneers during crimping and they are expensive.[6] It is a Stainless steel crown faced with high quality composite. Manufacturer claims it to be Color stable, plaque resistant and matches pedo-shades. It doesn't cause wear of opposing teeth.

However there are no long term clinical trials to assess the durability of these crowns. It is available in upper and lower – right & left central and lateral with 6 sizes.[21,22]

Kinder crowns :

Kinder Crowns offer the most natural shades and contour available for the pediatric patient. The great depth and vitality from the lifelike composite reveal a natural smile without the bulky “Chiclet” look of other restorations. They come in 2 aesthetically pleasing shades, Pedo 1 and Pedo 2. Pedo 2 shade is the most natural shade While Pedo 1 shade is for those cases when the bleached white shade is wanted. Figure 37-49

Kinder Crowns are designed with IncisaLock™ - the optimal union of state-of-the-art bonding procedures and mechanical retention. By adding mechanical retention and more composite, Kinder Crowns are strong without sacrificing form or function[6]

Pedo Pearlstm

These are beautiful heavy gauge aluminum crowns coated with FDA food grade powder coating and epoxy-resin. They serve as ultimate permanent crown for primary teeth. Features include:

- Universal anatomy--use on either side
- Easy to cut and crimp, without chipping or peeling.
- Composite can be added

Disadvantages include less durability and the crowns are relatively soft.[8]

Dura crowns

Crowns can be crimped labially and lingually, can be easily trimmed with crown scissors, easily festooned and has got a full-knife edge. Study has shown that these crowns with veneer facings were significantly more retentive than the nonveneered ones when cement and crimping were combined.[7].

## 2. Discussion

Restorative treatment is based upon the results of an appropriate clinical examination and is ideally part of a comprehensive treatment plan. The treatment plan shall take into consideration:

1. developmental status of the dentition;
2. caries-risk assessment<sup>2,3</sup>;
3. patient's oral hygiene;
4. anticipated parental compliance and likelihood of timely recall;
5. patient's ability to cooperate for treatment.

Restoration of primary teeth differs from restoration of permanent teeth, due in part to the differences in tooth morphology. The mesiodistal diameter of a primary molar crown is greater than the cervicoocclusal dimension. The buccal and lingual surfaces converge toward the occlusal. The enamel and dentin are thinner. The cervical enamel rods slope occlusally, ending abruptly at the cervix instead of being oriented gingivally, gradually becoming thinner as in permanent teeth.[1,9]

The pulp chambers of primary teeth are proportionately larger and closer to the surface. Primary teeth contact areas are broad and flattened rather than being a small distinct circular contact point, as in permanent teeth. Shorter clinical crown heights of primary teeth also affect the ability of these teeth to adequately support and retain intracoronal restorations.[6,7,11]

Young permanent teeth also exhibit characteristics that need to be considered in restorative procedures, such as large pulp chambers and broad contact areas that are proximal to primary teeth.[8,9]

Tooth preparation should include the removal of caries or improperly developed tooth structure to establish appropriate outline, resistance, retention, and convenience form compatible with the restorative material to be utilized. Rubber-dam isolation should be utilized when possible during the preparation and placement of restorative materials.

Dentin/enamel adhesives allow bonding of resin-based

composites and compomers to primary and permanent teeth. Adhesives have been developed with reported dentin bond strengths exceeding that of enamel.<sup>10-12</sup> In vitro studies have shown that enamel and dentin bond strength is similar for primary and permanent teeth.<sup>7-14</sup> The clinical success of adhesives allows for more conservative preparation when using composite restorative materials.[12,16,18]

The dental literature supports the use of tooth bonding adhesives, when used according to the manufacturer's instruction unique for each product, as being effective in primary and permanent teeth in enhancing retention of restorations, minimizing microleakage, and reducing sensitivity.[20,21]

Stainless steel crowns are prefabricated crown forms that are adapted to individual teeth and cemented with a biocompatible luting agent. "The SSC is extremely durable, relatively inexpensive, subject to minimal technique sensitivity during placement, and offers the advantage of full coronal coverage.[1,11,12]

A resin or porcelain veneer restoration is a thin layer of restorative material bonded over the facial or buccal surface of a tooth. Veneer restorations are considered conservative in that minimal, if any, tooth preparation is required. Porcelain veneers usually are placed on permanent teeth.

Veneers may be indicated for the restoration of anterior teeth with fractures, developmental defects, intrinsic discoloration, and/or other esthetic conditions.[7,14,18]

An extensive review of the dental literature concerning the full coronal coverage of primary anterior teeth was performed and articles systematically reviewed by objective criteria. As a result no clinical studies were identified that met all or even a majority of the criteria, indicating that there was little, good scientific support for any of the clinical techniques which clinicians have utilized for many years to restore primary anterior teeth. While lack of strong clinical data does not preclude the use of these techniques it points out the strong need for well designed, prospective clinical studies to validate the use of these techniques. Several difficulties and obstacles have been described which make these types of clinical studies difficult to carry out. In spite of the difficulties, it is recommended that efforts be made to scientifically evaluate clinical longevity and success of various restorative techniques for primary anterior teeth[9,10,12,16].

In the past, the only treatment option for pulpally involved primary teeth would have been to extract the teeth and replace them with prosthetic substitutes, until the permanent teeth erupted. However, the availability of natural crowns and roots would allow the use of biologic restorations to preserve the integrity of patient's natural dentition, in the meantime provide excellent esthetic, functional advantages to achieve the morphofunctional restoration. This method of using biological crown and post restoration for primary teeth affected by ECC has shown promising results.[21,22]

Also, this technique is simple, provides excellent esthetics, preserves natural tooth colour, allows the preservation of sound tooth structure and has low cost. The enamel of the

biologically restored tooth has physiologic wear and offers superficial smoothness and cervical adaptation compatible with those of surrounding teeth. Biological restorations not only mimic the missing part of the oral structures, but are also biofunctional. Advantages include, the length of each appointment is reduced because natural teeth are prepared previously and clinical chair time for fragment bonding procedures is relatively short, which is a merit especially while dealing with paediatric patients. However, disadvantages of the biological restoration technique include the difficulty in obtaining teeth with the required coronal dimensions and characteristics, problems inherent to indirect restorations and matching fragment colour with tooth remnant colour. Also, having fragments from other people's

teeth in their mouth is not a pleasant idea for some patients and many of them refuse to receive this treatment. However, all these factors are not Ocontraindications of the technique[1.3.6,9,15,19].

### 3. Conclusion

Many restorative options exist for treating primary anterior teeth. Finally the choice of restorative technique depends upon the operator preferences, esthetic demands by the parents and child's behavior that affect the ultimate outcome of whichever restorative material chosen.



Figure 1. What is baby bottle tooth decay?



Figure 2. Child tooth trauma



Figure 3. Intraoral photograph of the boy before treatment

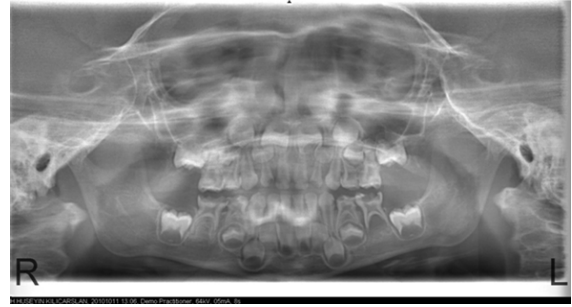


Figure 4. Panoramic radiographs of the boy before treatment



Figure 5. Intraoral photograph of the girl before treatment



Figure 6. Panoramic radiographs of the girl before treatment



Figure 7. Teeth after preparation for the boy



Figure 8. Teeth after preparation for the girl



**Figure 9.** Postoperative intraoral photograph of the boy



**Figure 10.** Postoperative intraoral photograph of the girl



**Figure 11.** After 6 months photograph of the boy



**Figure 12.** After 6 months photograph of the girl



**Figure 13.** After one and a half year photograph of the boy



**Figure 14.** After one and a half year photograph of the girl



**Figure 15.** Neglected nursing-bottle caries in a 2-year-old child



**Figure 16.** Same patient after pulpomotomies and placement of stainless steel crowns.



**Figure 17.** Same patient after opening of labial surfaces on crowns and placement of composite facings



**Figure 18.** Another shot of the before teeth



**Figure 19.** This is with the decay removed



**Figure 23.** Different view, same child.



**Figure 20.** Here is what the crown formers



**Figure 24.** Other side



**Figure 21.** Here is the finished case. The teeth were pretty crowded so I didn't get quite the angulation



**Figure 25.** Decay removed. Note the caries detector shows some slight stain. If I had removed any more tooth structure I would have been forced to do pulpotomies.



**Figure 22.** Preop decay. This 2 year old only had a couple of small decayed areas on the lower arch.



**Figure 26.** Other view





*Figure 27. Different angle*



*Figure 31. Granted the problems are more cosmetic*



*Figure 28. Strip crowns placed*



*Figure 32. Preop. of another hospital case.*



*Figure 29. Another 2 year old child with bottle mouth, or "soft teeth", or "teeth with no enamel"*



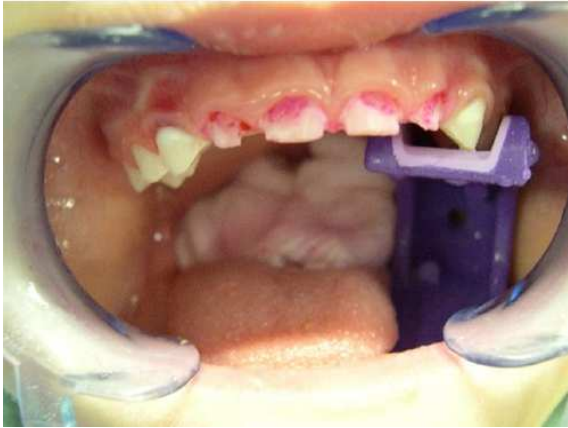
*Figure 33. Another view*



*Figure 30. Another angle..*



*Figure 34. The majority of the decay has been removed and caries detector is in place for 10 seconds.*



**Figure 35.** I only remove the dark staining. I leave the light stain as I think it is affected dentin only.



**Figure 36.** He two laterals have been cured and still have the formers in place.



**Figure 37.** Finished view



**Figure 38.** Kinder Crowns® - Pediatric Crowns, offer the most natural shades and contour available for the pediatric patient.



**Figure 39.** NuSmile Pediatric Crowns



**Figure 40.** 3-1/2 - year - old boy with early childhood caries of incisors.



**Figure 41.** After caries removal, labial groove to retain resin-modified glass-ionomer liner



**Figure 42.** RMGI liner in place, tooth "minaturization with low-speed round bur



**Figure 43.** "Minaturization" (tooth preparation) with high-speed water-cooled diamond bur



**Figure 44.** Final preparation completed



**Figure 45.** 9 months postoperatively



**Figure 46.** Patient with severe caries.



**Figure 47.** Patient after restoration with NuSmile(r) Crowns.



**Figure 48.** After restoration, lingual-palatal view.



**Figure 49.** After restoration, close-up view.

## References

- [1] Durante A Claudia, Wanderley MT. Biological restoration of primary anterior teeth. *Quintessence International* 2000; 31(6) 404-406.
- [2] Mortada A, King NM. A simplified technique for restoring severely mutilated primary anterior teeth. *J Clin Pediatr Dent* 2004; 28:187-92.
- [3] Wanderley MT, Ferreira SLM, Rodrigues CRMD, Rodrigues LEF. Primary anterior tooth restoration using posts with macro retentive elements. *Quint Int.* 1999; 30:432-6.
- [4] Mendes FM, De Benedetto MS, del Conte Zardetto CG, Wanderley MT, Correa MS. Resin composite restoration in primary anterior teeth using short-post technique and strip crowns: A case report. *Quintessence Int* 2004; 35:689-692.

- [5] Motisuki C, Santos-Pinto L, Giro EM. Restoration of severely decayed primary incisors using indirect composite resin restoration technique. *Int J Paediatr Dent* 2005; 15: 282–286.
- [6] Arens D. The Role of Bleaching in Esthetics. *Dent Clin N Am* 1989; 33:319-36.
- [7] Shah PV, Lee JY, Wright JT. Clinical success and parental satisfaction with anterior veneered primary stainless steel crowns. *Pediatr Dent* 2004;26:391-5.
- [8] Usha M, Deepak V, Venkat S, Gargi M. Treatment of severely mutilated incisors: a challenge to the pedodontist. *J Indian Soc Pedod Prev Dent* 2007;25 Suppl:S34-6.
- [9] Waggoner WF. Restoring primary anterior teeth: Review. *Pediatr Dent* 2002;24:511- 6.
- [10] Mandroli PS. Biologic restoration of primary anterior teeth: A case report. *J Indian Soc Pedod Prev Dent*, 2003;21:95-97.
- [11] Ranires Romito ACD, Wanderley MT, Oliveira MDM, Imparto JCP, Pires Correa MSN: Biologic restoration of primary anterior teeth. *Quint Int* 2000; 31: 405 - 411.
- [12] Kapur A, Chawla HS, Goyal A, Gaube K. An aesthetic point of view in very young children. *J Clin Pediatr Dent* 2005;30:99-103.
- [13] Busato AL, Loguercio AD, Barbosa NA, Sansverino MC, Macedo RP, Baldissera RA. Biological restorations using tooth fragments. *Am J Dent* 1998;11:46-49.
- [14] Barcelos R, Neves AA, Primo L, Souza IPR. Biological restorations as an alternative treatment for primary posterior teeth. *J Clin Paediatr Dent* 2003;27:305-310.
- [15] Yang ZP, Chang CS. A 3-year follow-up of a homo transplanted tooth from a tooth bank. *J Endod* 1990;16:34-37.
- [16] Cru E, Carpenter WM. Extracted teeth - Decontamination, disposal and use. *J Cal Dent Assoc* 1997;25:801-804.
- [17] Lee JK. Restoration of primary anterior teeth: review of the literature. *Pediatr Dent* 2002;24:506-10.
- [18] Baker LH, Moon P, Mourino AP. Retention of esthetic veneers on primary stainless steel crowns. *ASDC J Dent Child* 1996;63:185-9.
- [19] Guelmann M, Gehring DF, Turner C. Retention of veneered stainless steel crowns on replicated typodont primary incisors: an in vitro study. *Pediatr Dent* 2003;25:275-8.
- [20] Yilmaz Y, Guler C. Evaluation of different sterilization and disinfection methods on commercially made preformed crowns. *J Indian Soc Pedod Prev Dent* 2008;26:162-7.
- [21] Kupietzky A, Waggoner WF, Galea J. The clinical and radiographic success of bonded resin composite strip crowns for primary incisors. *Pediatr Dent* 2003;25:577-81.
- [22] Sharaf AA. The application of fiber core posts in restoring badly destroyed primary incisors. *J Clin Pediatr Dent*. 2002;26:217-24.