

Esthetic Restoration of Badly Damaged Anterior Primary Teeth: A Review of Available Options

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Abstract: The primary maxillary incisors teeth are small and require restorations that are retentive, esthetic and resistant to fracture and wear, therefore, are difficult to treat. Esthetic treatment of severely decayed primary teeth is one of the greatest challenges for pediatric dentists. The use of esthetic restoration has become an important aspect of pediatric dentistry. However, various treatment options have been described in literature to ensure proper esthetics and retention of restorations for such cases.

Keyword: Esthetic Crowns

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I. Introduction

Dental decay in primary teeth is a significant public health problem, affecting 60% to 90% of school children in industrialized countries (WHO Report 2003). Carious involvement of maxillary incisors and traumatic injuries, not only compromises the integrity of dentition, but can also create an undesirable esthetic appearance, making the management of these teeth difficult. Esthetic treatment of severely decayed primary teeth is one of the greatest challenges for pediatric dentists. The use of esthetic restoration has become an important aspect of pediatric dentistry. Several options are available for providing full coverage restoration for the primary dentition, with each approach having advantages and disadvantages. [1]
This paper aims to discuss a few options available to the dentist for restoring such teeth.

Stainless Steel Crowns or Preformed Metal Crown (Pmcs)

These were first described in 1950 by Engel followed by Dr. William Humphrey (1950). They were made of stainless steel and were referred to by an acronym, SSC. Croll described that SSC are easy to place, fracture proof, wear resistant and firmly attached to the tooth until exfoliation. The main disadvantage is the metallic silver appearance. As the population has become highly conscious of esthetics, the SSC have become least desirable.[2]

Open Faced Stainless Steel Crown

The preformed stainless steel crown is the most durable and reliable restoration for a primary incisor in need of complete coverage but it is also true that it is the least attractive. To take advantage of the strengths of preformed stainless steel crowns and improve the appearance of treated teeth, the dentist can cut away the cosmetically prominent aspect of the crown, remove enough of the luting cement to leave retentive undercuts, and fill the void with bonded resin composite. The success of open-face stainless steel crown is caused by: 1. firmly bonding resin to teeth tissue 2. Using dentin bonding 3. Phosphoric acid etching. A rough and porous structure may be formed on the remaining glass ionomer cement. Unfilled resin may infiltrate into this irregular and hard surface, form holding tags, and, thus, contribute to bonding.[3]

Preveneered Stainless Steel Crowns

Preveneered stainless steel crowns (PVSSCs) offer a potential esthetic and durable restoration for grossly decayed primary teeth, as these crowns allegedly combine the durability of conventional SSC with the esthetic appeal of composite resin. These crowns are available with a variety of facing materials such as composite resin or thermoplastic resin bonded to the stainless steel crown. Esthetic veneers are retained on the stainless steel crowns using a variety of mechanical and chemical bonding approaches. Currently, at least 4 manufacturers fabricate this product. Preveneered crowns were initially developed for primary anterior teeth; later veneered crowns for primary molars became available. The various types of PVSSCs available commercially differ in terms of the method of facing attachment to the SSC, shades available, crown length and clinician's ability to crimp the crown.[4]

Pedo Jacket Crowns

The Pedo Jacket is handled similarly to a celluloid crown form, only the “jacket” is made of a toothcolored copolyester material, which is filled with resin material and left on the tooth after polymerization instead of being removed as the celluloid crown form is. There are difficulties with this crown. One problem is that these crowns only come in one shade, which is very white, so matching; adjacent, nonrestored teeth can be difficult. Also, because the crowns are made of copolyester, they cannot be trimmed or reshaped with a high-speed finishing bur due to the fact that the material will melt to the heat of the bur.[5]

Polycarbonate Crowns

These are the temporary crowns which can be given in such situation as a fixed prosthesis to deciduous anterior teeth which will get exfoliated in future. Polycarbonate crowns are aromatic linear polyesters of carbonic acid. They were popular in the 1970's, however, although they were more aesthetic than stainless steel crowns, the polycarbonate material was brittle and did not resist strong abrasive forces, exhibiting frequent fracture and dislodgement. With the advent of composite strip crowns they lost their popularity. In the 1990's new manufacturing techniques made them thinner and more flexible resulting in stronger restoration and resurgence in their use.[6] Some of the commercially available polycarbonate crowns include:

1. 3M ESPE Polycarbonate Crowns
2. Kudos polycarbonate crowns
3. Pedonatural Crowns

Zirconia Pediatric Crown

These are crowns made of Zirconia for the primary dentition that contain no metal. Zirconia is currently the strongest dental ceramic available and is also esthetically pleasing. Even though Zirconia is widely accepted as a restorative material for the permanent dentition, it is a relatively new restorative material for the primary dentition. Current research on passive fit prefabricated Zirconia crowns for primary anterior teeth is limited.[7] Some of the commercially available pediatric Zirconia crowns are discussed:

1. E Z Pedo crowns
2. Nusmile Zirconia crowns
3. Cheng Zirconia pediatric crowns
4. Kinder Zirconia pediatric crowns

Strip Crowns Primary Anterior Strip Crowns

They were developed as an answer to the esthetic and functional problem of stainless steel crowns. These are amongst the most esthetic and popular restorations

For carious primary anterior incisors. Resin composite strip crowns (scs) have been utilized for over 2 decades to restore carious primary teeth.¹⁴This is the first choice of many clinicians due to the superior esthetics and the ease of repair if the crown subsequently gets chip off or fracture. This is, however, the most technique-sensitive option. The strip crowns are transparent crown forms which simplify composite work for pedodontic anterior restoration. These are trimmed and filled with either chemical or light curing composite material. They contour the material and support it while it sets and then strip off easily leaving smooth surface. [8]

New Millennium Crowns

This crown is similar in form to the Pedo Jacket and strip crown except that it is made of a laboratory enhanced composite resin material. Like the other two, the crown form is filled with resin material and bonded to the tooth. These crowns can be very esthetic and can be finished and reshaped with a high-speed bur. The crown forms are very brittle, however, and can crack or fracture if forced down onto a preparation that has not been adequately reduced. These crown forms are also significantly more expensive than either of the other two.

II. Conclusion

Through this manuscript, effort has been made to bring together the various approaches for full coverage restorations in pediatric dental practice. Each technique and material carry its own advantages and disadvantages. Many options exist to repair carious teeth in pediatric patients as is discussed, from stainless steel crowns to its various modifications to other esthetic crowns like strip crowns and zirconium crowns which are rising in their popularity.

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