

## Aesthetic Crowns in Pediatric Dentistry

Research Article

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## Abstract

Early childhood caries remains a significant problem challenging our diagnostic, preventive, and restorative skills. Often, caries in very young children involves the maxillary anterior teeth and the primary molars while the mandibular anterior teeth are generally not involved. Carious involvement of the maxillary incisors not only potentially compromises the integrity of the dentition, but can create an undesirable esthetic appearance. This paper will highlight on the aesthetic crowns available in paediatric dentistry.

## Introduction

Early childhood caries is defined as the presence of carious lesion in one or more teeth in children less than 71 months of age and the labial surface of the upper anterior teeth is one of the most commonly affected. ECC results in pain, aesthetic problems, phonation, swallowing and even loss of anterior space. This affects the oral health as well as the general health of the child. The speech and aesthetics of the child is also affected resulting in loss self-esteem of the child. Esthetic rehabilitation in children plays a key role in phonetics, speech and elevating the self esteem of the child. Pediatric dentist plays a pivotal role in restoration of the affected teeth. They should not take much time as patient cooperation is difficult in case of pediatric dentistry.[1] The color, shape and texture of the teeth surface are essential for a beautiful smile since children also have aesthetic perception of their teeth. Esthetic crowns available for pediatric patients are Acrylic crowns, Strip crowns, Polycarbonate crowns, Cheng crowns, Pedo Jacket crowns, New Millennial crowns, Zirconia crowns and the latest one being Figaro crowns. [2]

## Classification

These prefabricated crowns can be classified under the following broad headings. These crowns are also available in a range of sizes depending on the dimensions of different primary teeth.

Based on method of cementation to tooth.

- Bonded crowns -Polycarbonate crowns, Strip crowns, Pedo jacket crowns, Artglass crowns
- Luted crowns -stainless steel crowns with facing, Kinder crowns, Cheng crowns, NuSmile crowns, Dura crowns, Whiter Biter crowns, PedoCompu crowns, High density polyethylene veneered crowns

## Based on the material of the crowns

- Polymer - polycarbonate crowns, strip crowns
- Pre veneered stainless steel- Nu- smile Signature
- Zirconia-EZ pedo, Nu-Smile ZR
- Aluminium veneered with tooth colored material- Pedo pearls [3-6].

## Open-faced stainless steel crowns

For incisors, the main indication for stainless steel crowns is following crown fracture, when they are used to retain pulp-protecting dressings, prevent leakage, and to restore form and function, provided the crowns are trimmed and crimped properly, and the edges well-polished, they fulfil the requirements very well. The main drawback is aesthetics, and this problem is overcome by cut-

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Received: April 20, 2021

Accepted: July 09, 2021

Published: July 19, 2021

Citation: Subramanian EMG, Deepa. G, Mebin George Mathew. Aesthetic Crowns in Pediatric Dentistry. *Int J Dentistry Oral Sci.* 2021;8(7):3424-3426.doi: <http://dx.doi.org/10.19070/2377-8075-21000696>

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ting out the labial face of the crown and filling in with a tooth-coloured material, such as composite. With the development of the acid-etch technique, and the improvement in handling, finishing aesthetic considerations of composite materials, these have largely replaced the use of stainless steel crowns for the repair of fractured incisors. However, when the fracture-line extends to below the gingival margin, the stainless steel crown may still be the better choice. Hartmann CR and Helpin ML2 suggested that in children with rampant carious lesions, open-faced stainless steel crowns can be used. Although some esthetics is sacrificed, increased functional stability is added to these restorations. [1]

Roberts C et al[3] conducted the first study on resin-faced stainless steel crowns used for restoring primary anterior teeth and described the clinical performance of these crowns. He concluded that these stainless steel crowns have high rate of retention and there was high prevalence of one third of the facing failure which occurred most commonly at resin-resin and resin-metal interface.

### Polycarbonate crown

In children, the most common lesion in anterior teeth are due to nursing bottle caries. These lesions begin on the labial surface of all anterior and they progress rapidly as diffused demineralization of the entire surface of all existing teeth. The best a dentist can offer at this time is the stabilization of the lesion. Polycarbonate crowns 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. According to Nitkin DA et al [7] these crowns exhibit high impact strength and rigidity and are termed thermoplastic resins since they can be molded as solids by heat and pressure into desired form.

### Strip Crowns

Primary anterior strip crowns were developed as an answer to the esthetic and functional problem of stainless steel crowns. Esthetically, they provide a striking similarity to the original primary tooth. Functionally, they allowed for normal incisal wear of the primary teeth to take place. Use, however, was restricted to primary teeth having sufficient enamel for bonding retention after caries removal. Resin-bonded composite strip crowns are the first choice restoration for many clinicians, mainly because of the superior aesthetics and the ease of repair if the crown subsequently chips or fracture. However, it is the most technique-sensitive option. Moisture contamination with blood or saliva may interfere with the bond, and haemorrhage can alter the shade or colour of the material. Additionally, adequate tooth structure must remain after caries removal to ensure that there is sufficient surface area for bonding. The strip crowns are transparent crown forms which simplify composite work for Pedodontics 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.

### Other Newer Crowns

#### Pedo Jacket Crown

Pedo Jacket crown is made up of tooth coloured polyester mate-

rial and is filled with resin material. It is left on the tooth after polymerization apart from being removed from celluloid crown form after curing of luting resin cement1.

#### New Millennium Crown

They were introduced in market by the Success Essentials, Space Maintain Laboratory. These crowns are made up of composite resin material that is laboratory enhanced. They are similar to Pedo jacket crown and strip crown. The advantage being that they can be finished and reshaped with a high-speed finishing bur. However disadvantages include that they are very brittle and more expensive than other crown forms and cannot be crimped.1

#### Pedo Pearl

It is a new type of crown in the process of being developed and field tested. It is a metal crown form similar to a stainless steel crown, but it has been completely coated with tooth-coloured epoxy paint. These crowns are made of aluminium instead of stainless steel as the epoxy coating adheres much better to the aluminium. They serve as ultimate permanent crown in the primary dentition.

According to Sahana S et al[1], the various advantages are they are easy to cut and crimp without chipping and the composite can be added afterwards also. However they have less durability and are relatively soft.

#### Artglass crowns

Artglass crown commonly known as Glastech, is made up of art-glass which is a polymer glass used for restoration of anterior primary teeth. It is a new multifunctional methacrylate with the ability of forming three dimensional molecular net works with highly cross linked structure. They have the micro glass and silica as filler materials which provide greater durability and esthetics than strip crown. It gives dual advantages which provides the bondability and feel of composites and longevity and esthetics of porcelains. [8]

### Conclusion

Several modifications and newer esthetic crowns have been presented to overcome the disadvantages of stainless steel crowns. These crowns were introduced to meet the increasing esthetic demands of patient as well as their parents. These modifications include open faced and veneered stainless steel crowns. Open faced stainless steel crowns have a facial window cut wherein composite resin is bonded onto the tooth whereas in pre-veneered crowns (Nu Smile primary crowns, Kinder crowns), esthetic composite veneers are retained onto stainless steel using variety of mechanical and chemical bonding approaches. Both these crowns have superior esthetics than conventional stainless steel crowns. However, their durability is compromised because of limited crimping. These crowns are also bulky, very expensive and lack natural appearance.

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