MODERN CONCEPTS IN ESTHETIC REHABILITATION OF PRIMARY ANTERIOR TEETH IN PEDIATRIC DENTISTRY

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ABSTRACT

The role of stainless steel crowns in pediatric dentistry is taking a back seat nowadays, as the use of more esthetically acceptable crowns is in vogue. Various esthetic pediatric crowns have made their way into dentistry and the practical implication of each crown depends on their clinical impression achieved. These esthetic crowns are divided into two groups based on their mode of adhesion, those which can be directly bonded to the tooth surface and those that can be luted. This review briefs through the various pediatric esthetic crowns based on their clinical orientation.

Key Words: esthetics, stainless steel crowns, composite, anterior primary teeth, early childhood caries, bonded, luted

INTRODUCTION

Early childhood caries is a debilitating dental health issue, occurrence of which has increased tremendously over the recent years¹. Management of Early Childhood Caries(ECC) is a nightmare for the general dentist and a potent challenge for the pediatric dentist. Carious destruction of the tooth structure in a child not only compromises esthetics but also other vital functions such as speech, mastication and development of unwanted oral habits that exerts a deleterious effect on the entire orofacial musculature². Hence the need for protecting the caries affected tooth structure has become inevitable. Behavior management, cost effectiveness of the treatment and morphological variations such as mesiobuccal bulge, marked cervical constriction, thinner enamel, higher pulp horns in primary teeth presents a challenge in restoring them 3.

In patients with large, multisurface carious lesions the American Academy of Pediatric Dentistry recommends full coverage of crowns⁶. Stainless steel crowns are the most commonly used full coronal restoration in primary teeth 5. Despite their high success rates, this proven restoration often fails to meet theesthetic requirements of the parents and the patients. This review focuses on the various esthetic replacements of the stainless steel crowns presently available in the market and their implications in clinical practice.
Full Coverage Crowns in Pediatric Dentistry

Stainless steel crowns were introduced in the 1950 by Dr. William Humphrey. These crowns were biologically acceptable, competent for mastication and clinically acceptable restoration, though they lagged behind in terms of esthetics. These full coverage crowns maintained the form and function of the prepared tooth.

Full coronal restorations are indicated under the following circumstances:
1. Early childhood caries causing extensive destruction of the tooth structure (Fig 1).
2. Traumatized tooth exhibiting unaesthetic discolorations.
3. Teeth with developmental defects such as enamel hypoplasia, amelogenesis imperfecta.
4. Post pulpal procedures.
5. Decalcified teeth
6. High risk patients with poor oral hygiene status.

![Fig 1: Intraoral View of An Early Childhood Caries Patient](image)

ESTHETIC MODIFICATIONS OF STAINLESS STEEL CROWNS

In order to overcome the drawback of stainless steel crowns, newer esthetic crowns have come into existence. Esthetic stainless steel crowns have composite or porcelain veneers incorporated over a stainless steel base, which enhances their durability. Around 1.5-2 mm esthetic facings are given over the stainless steel base. These crowns are categorized into 2 types: Luted and Bonded (Table 1).

![Fig 2: Open Faced Stainless Steel Crowns](image)

Table 1: Esthetic pediatric crowns variants

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OPEN FACED STAINLESS STEEL CROWNS:

This is a simple variant of the normal stainless steel crown where after cementation a labial fenestration is created. The prepared window is filled in with a composite resin and pressed for the resin to flow evenly through the undercuts (Fig 2). The main advantage of these crowns is that they are simpler to place and are esthetically pleasing. The limitations are that these crowns are easily prone to fracture when trimmed and time consuming. Due to the prominent buccal bulge in primary teeth the crown gets a “chiclet” appearance and in addition the metal margins are visible even after finishing.

STRIP CROWNS

Strip crowns are crystal clear; highly transparent thereby enabling better light curing. They can be easily fit, removed and repaired. It leaves a smooth shiny surface after polymerization and their shade matches with that of natural dentition.

The mesiodistal width of the prepared tooth structure is measured and the strip crown is...
selected accordingly. After making holes in the incisal edge of strip crowns it is filled with the composite resin and cemented over the prepared tooth. After polymerization the crown form is stripped off and hence it is called as strip crown (Fig 3).

![Fig 3: Strip Crowns](image1)

Jain M et al conducted a case study regarding the esthetic rehabilitation using polyethylene fibres in two different approaches (with and without intracoronal support) and drew the conclusion that strip crowns that took intra coronal support were found to have a far better fracture load resistance compared to the normal coronal restorations9.

A study was conducted by Ram D et al to assess retrospectively the longevity of composite strip crowns of 387 children aged 24 -48 months. They concluded that more than 80% of the restorations were judged to be successful at the time of final follow up. Hence this restoration was found to be an esthetic and satisfactory means of restoring carious primary teeth10.

The major limitation of this crown is that it is very technique sensitive. Any defect in the prepared tooth surface or in the isolation procedures would lead to the immediate fracture of the crown structure11.

**PEDO JACKET CROWNS**

These crowns are made of tooth colored copolyester material which is filled with a composite resin and then cemented on to the prepared tooth surface. The only difference between this and the strip crown is that in the latter the crown form is removed, while in this it is retained8. It does not split, stain or crack7 (Fig 4). They are available in only one shade and cannot be trimmed using a high speed finishing bur.

![Fig 4: Pedo Jacket Crowns](image2)

**NU SMILE CROWNS**

These crowns have a sputter coated intermediate surface which increases the surface area and thus a better bond is established. These crowns are less technique sensitive, more color stable and durable. They are available in six different shades and have a better anatomic configuration when compared to other crowns (Fig 5). They are available in different shapes for anterior and posterior teeth.7.

![Fig 5: Polycarboxylate Crowns](image3)

**CHENG CROWNS**

These crowns are faced with a high quality composite, mesh based with a light cured composite. They are simpler to place with less patient discomfort, plaque resistant, color stable and cause minimal wear to the opposing tooth (Fig 6), on the contrary they fracture easily on crimping and are expensive8.

**KINDER CROWNS**

In contrast to other crowns they have many minute depressions called incisalLocks. These incisalLocks increases their surface area thus provides better bonding and retention. They are available in different shades wherein some shades match natural teeth while some have a more bleached kind of appearance7. This crown does
not have the chiclet appearance (Fig7).

PEDO PEARLS
Pedo pearls are heavy gauge aluminium crowns coated with a FDA approved epoxy resin. These crowns can be crimped easily compared to other crowns (Fig 8) and due to their universal anatomy; they can be used on either side. A study conducted by Yilmaz et al regarding the sterilization and disinfection methods of commercially available for preformed crowns concluded that pedo pearls are relatively soft and are less durable compared to other crowns12.

GLASTECH CROWNS
These crowns are made up of unique filler particle mixture of silica and microglass (artglass). This makes the crown more durable and bondable to the prepared tooth structure. They are color stable, plaque resistant and have wear resistance similar to that of the enamel7.

DURA CROWNS
Dura crowns are pediatric white faced crowns. They can be crimped and festooned to get a knife edged margin7.

Although most of these esthetic crowns available in the market are esthetically pleasing and convincing the parent and the esthetic conscious younger patients in restoring primary anterior teeth is a simpler task to a pediatric dentist.

CONCLUSION
The newer variations of esthetic crowns are a boon to Pediatric dentistry and these advances have provided the dentist various options for achieving excellent esthetic rehabilitation in the primary dentition. Apart from the achieved dental benefits, esthetic oral rehabilitation also contributes towards the improvement of general and psychological well being of the patient.

REFERENCES