

## Prevalence Of Anterior Strip Crowns Among Carious Primary Teeth

Research Article

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### Abstract

In case of congenital malformation, discoloration of teeth suffered from trauma or congenitally and teeth with amelogenesis imperfecta and post pulpectomy strip crowns are given. Strip crowns are transparent plastic crowns with varying sizes. The aim of the study is to evaluate the prevalence strip crowns were preferred for a carious primary teeth. A retrospective study was carried out using case records of 199 patients who reported to the Department of Pedodontics from June 2019 to March 2020. The various cases where strip crowns were preferred for treatment were observed from the digital records and tabulated on a spreadsheet. The collected data was analysed by computer software SPSS version 21 using Chi square test with the level of significance with age, gender of patients who selected strip crowns. The patients who took strip crowns were 51.8% other treatment for anterior carious primary tooth was 48.2%. The strip crowns were taken as a treatment of choice for anterior primary carious teeth after pulpectomy and it was prevalently used among male children in the age group of 3 to 5 years of age. Both age and gender of the children had no significant association with strip crowns as a treatment of choice.

**Keywords:** Amelogenesis Imperfecta; Congenital Malformation; Pulpectomy; Strip Crowns.

### Introduction

Dental caries is the single most common chronic childhood disease affecting worldwide. Poor oral hygiene and dental plaque is one of the aetiological factors in causation of dental caries [1]. It has been shown to have a multifactorial etiology which leads to the initiation and progression of the lesion [2]. In early childhood caries there is early pulp involvement and gross destruction of maxillary anterior teeth as well as posterior teeth. The major concern in the field of paediatric dentistry is the loss of primary teeth despite various efforts available in the prevention of dental caries in children [3]. One of the main reason for extensive caries are decreased fluoride concentration leads to increased risk of caries [4, 5]. Treatment of such caries represents a challenge to paediatric dentistry especially when the teeth are badly destroyed [6]. The retention and preservation of the primary tooth in the dental arch in its normal function and free of pathology is of

utmost importance [7].

Pulpectomy procedure is performed in primary teeth to avoid extraction and to maintain its form and function [8] and a conservative treatment approach that retains and preserves the primary tooth in the dental arch and non-pathologic state until its exfoliation [9]. Rotary instrumentation in pediatric dentistry is an emerging concept [10]. Using rotary instruments for primary tooth pulpectomies resulted in better and predictable root canal filling [11]. Nickel-Titanium (Ni-Ti) instruments are available to perform efficient root canal preparation in primary teeth [12].

Aesthetic restoration of such carious primary teeth in children has been an ongoing challenge for the paediatric and general dentist while the most effective aesthetic materials and techniques for restoring deciduous teeth are still questioned. With the advancement of dental materials and techniques in conservative

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dentistry, a multitude of aesthetic treatment modalities have been introduced for the management of dental caries and trauma in the primary dentition [13]. Since primary teeth play an imperative role in the self-esteem of the preschool children and also plays a pivotal role in speech development, esthetics, and function [14].

In case of severely decayed primary incisors with minimal enamel remaining for bonding, subgingival caries, and uncontrolled moisture and hemorrhage, stainless steel crowns are their restoration used [15, 16] and for the primary interest is the most aesthetic treatment of choice used in composite resin crown type of crown was first introduced in 1979 by Weber and colleagues [17].

The indications for strip crowns include extensive decay of primary anterior teeth, fractured or malformed teeth, teeth that exhibit discoloration and as a coverage for teeth that have received pulp therapy. Composite resin strip crowns are now widely accepted because of them being better thick as they assemble more closely by natural appearance of teeth [18, 19]. There are numerous reports and articles in the literature that describe the technique for placement of these crowns [20]. The composite resin is a polymerized, the celluloid crown form is peeled off or "stripped" with a hand scaler, the remaining composite resin is finished at the margins and polished using a burn [21, 22].

Strip crowns are composed of celluloid crown forms that act as matrix forms to fill with tooth coloured materials. Usually their crowns are restored with a written based composite to allow for selection of shades to match the adjacent teeth and provide an excellent aesthetic outcome. Resin modified ionomer cement has been used for the material as an interim restoration in younger children [23, 24]. Previously our team has a rich experience in working on various research projects across multiple disciplines [4, 25, 26, 1, 16, 27, 36]. The aim of the study is to evaluate the use of strip crowns in the primary anterior teeth and its prevalence among different age groups and gender.

## Materials And Method

### Study design and Study setting

The present study was conducted in a hospital in Chennai to evaluate the patients who got strip crowns after pulpectomy, from June 2019 to March 2020. The retrospective study was carried out with the help of digital case records of 199 children that reported to the dental hospital for treatment. Since it is a retrospective study, carried out using digital case records, no informed consent was required from the patient. Ethical clearance to conduct this study was obtained from the Scientific Review Board of the hospital. All retrospective studies arising from the patient records set between 01 June 2019 and 31 March 2020 will be covered by the following ethical approval number. SDC/SIHEC/2020/DIAS-DATA/0619-0320.

### Sampling

The type of study was Retrospective. The data of 199 children were reviewed and then extracted. Only relevant data was included to minimize bias. Non probability sampling method was carried out. Cross verification of data for errors was done with the help of clinical photographs. The study contained regional data

generalised to the South Indian population.

### Data Collection

A single calibrated examiner evaluated the digital case records of the 199 patients from June 2019 to March 2020 and reviewed the crowns fabricated after for the patients after pulpectomy. They were categorised into strip crowns and other treatments. The internal validity of the study was among pedo patients who underwent pulpectomy. External validity of the study was to educate the patients on the advantages strip crowns over the other crowns. Inclusion criteria was anterior teeth with extensive caries which required pulpectomy followed by crown fabrication. Exclusion criteria included posterior teeth requiring pulpectomy.

### Statistical Analysis

The collected data was validated, tabulated and analysed with Statistical Package for Social Sciences for Windows, version 20.0 (SPSS Inc., Chicago, IL, USA) and results were obtained. Categorical variables were expressed in frequency and percentage; and continuous variables in mean and standard deviation. Chi-square test was used to test associations between categorical variables. Chi Square tests were carried out using demographic data like age and gender as independent variables and patient willingness and condition of the teeth as the dependent variable. P value < 0.05 was considered statistically significant.

## Results And Discussion

This study was carried out among 199 patients to evaluate prevalence of strip crowns in the primary anterior teeth post pulpectomy. The prevalence among different age groups and gender was evaluated. Out of 199 patients 51.76% of children got strip crowns and 48.24% of children got crowns other than strip crowns namely stainless steel, figaro and zirconia. Chi-square test was done between the treatment opted with age and gender. Below the age group of 2 years 6.53% of patients had strip crowns and 5.53% of patients had other types of crown. Between the age group of 3-5 years 42.21% of patients had 42.21% and 37.19% had crowns other than strip crowns. Above the age group of 5 years 3.02% of patients had strip crowns and 5.53% of patients had other types of crowns. Regarding the gender, in male patients 31.16% of patients had strip crowns and 27.14% had other crowns and in female patients 20.60% of patients had strip crowns and 21.11% of patients had crowns other than strip crowns.

The results of the study show (Figure 1) that for the treatment of anterior pulpectomy the most fabricated crown was anterior strip crowns, the results of the study is similar to Kupietzly et al [37] who reported that parental satisfaction with bonded resin composite strip crown for the treatment of primary incisors with multi surface carious lesion was higher. The results were also similar to a study by Divya subramaniyam and Ganesh Jeevanandan [38] which stated that parental satisfaction with treatment of both kids' strip crown and 3mespe crown were found to be satisfactory with no significant difference. Both crowns had similar clinical success rate at the end of the month follow up. KIDS strip crowns can be cost effective restoration option to be used in primary maxillary anterior teeth.

Figure 1. Bar chart depicting frequency of strip crowns fabricated compared to other crowns. X axis represents the crown fabricated and Y axis represents the number of children who underwent pulpectomy. 51.76% of patients got strip crowns after pulpectomy (Red colour). 48.24% of the patients got crowns other than strip crowns after pulpectomy (Yellow colour).

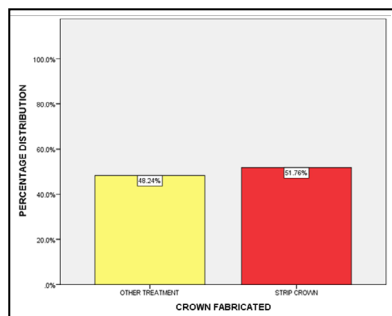


Figure 2. Bar chart depicting association between age of patients with crown fabricated. X axis represents age of patients and Y axis represents number of patients with crown fabricated after pulpectomy. Highest number of strip crowns (green) were fabricated in patients between the age of 3-5 years compared to other treatment. Chi square analysis done.  $p=0.36(p>0.05)$ , statistically not significant. Hence there is no significant association.

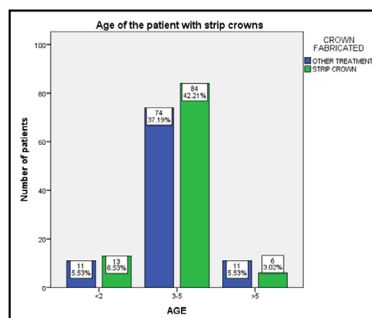
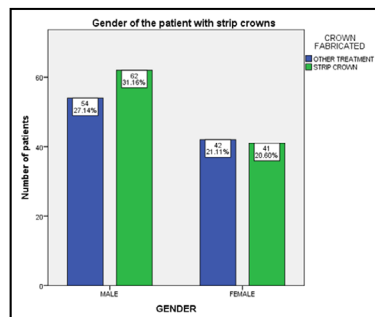


Figure 3. Bar chart depicting association between gender of patients with crown fabricated. X axis represents gender of patients and Y axis represents number of patients with crown fabricated after pulpectomy. Highest number of strip crowns (green) were fabricated among male patients compared to female patients. Chi square analysis done.  $p=0.57(p>0.05)$ , statistically not significant. Hence there is no significant association.



The results of the study show (Figure 2) that strip crowns were most preferred among the age group of 3-5 years. This is similar to the study by Tremblay L et al. [39] which stated that a very young child is often neglected by the dentist while choosing a treatment plan. However, recent work in psychology has shown that consciousness about self can begin as early as 3-5 years of age and a study by Sharat Chandra Pani et al. [40], findings of which showed that while children from a young age were able to appreciate and have an opinion about dental esthetics, their opinion often agrees with that of their parents.

According to the study results (Figure 3) gender has no significance correlation with strip crowns as a treatment of choice and male patients has got more strip crowns than female patients. The results are dissimilar to Mon Mon Tin Oo et al [41], which says dissatisfaction with tooth colour is significantly higher in female than male patients [odds ratio for 1.99, 95% confidence interval-1.1-3.50], hence female patients prefer strip crowns which is

more aesthetic. The result might change with different population and sample sizes.

By the result of the study it can be seen that strip crowns are the most commonly preferred crown over other crowns in case of exterior multi surface caries due to its durability aesthetics case of treatment and it being a cost effective mode of treatment. The limitations of the study include very less sample size and small geographical location with the period of study conducted being short. Our institution is passionate about high quality evidence based research and has excelled in various fields [42-52].

### Conclusion

Within the limitation of the study, it can be concluded that strip crowns were more preferred over other crowns for the treatment of anterior carious primary teeth because of its superior esthetics, ease of use and durability. The strip crowns were found to be used

in case of large or multi surface caries for better retention and was prevalently used in male children between the age of 3-5 years.

## Author Contribution

Author 1 (J.Chandrapooja) carried out the retrospective study by collecting data and drafted manuscript performing the necessary statistical analysis. Author 2 (Dr.Subramaniam EMG) aided in the conception of the topic, participated in the study design, statistical analysis and coordinated in developing the manuscript and author 3 (Dr.Ganesh Jeevanandan) aided in coordinating and developing the manuscript. All the authors have contributed in developing the manuscript.

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