Parental Satisfaction With Bonded Resin Composite Strip Crowns for Primary Incisors

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Abstract

Purpose: The purpose of this study was to evaluate the parental satisfaction of bonded resin composite strip crowns for the treatment of maxillary anterior primary incisors and compare their satisfaction with the clinical evaluation and success of the crowns.

Methods: This was a retrospective, clinical study of patients who had strip crowns (SC) placed on maxillary primary incisors, returned for at least 1 recall examination, and whose parents gave consent for them to participate in the study. Color photographs were used for evaluation by 2 independent pediatric dentists. Parental satisfaction regarding the esthetics of the crowns was evaluated by a questionnaire.

Results: One hundred and twelve restorations placed in 40 children were evaluated. The evaluations were performed after the crowns had been in place for an average of 18 months (range=6-25 months). Overall parental satisfaction with the treatment was excellent; however, satisfaction with regard to color received the lowest rating. No significant differences were found between dentist and parent evaluations of color, size, and overall appearance (Fisher exact test; P=.194,.776,.291, respectively). Parents rated their overall satisfaction as being positive regardless of their poor ratings of color, size, or overall appearance. However, a significant relationship was found between durability and overall satisfaction (P=.046). Parents who gave poor ratings to durability also rated their overall satisfaction as being poor.

Conclusions: Parental satisfaction with bonded resin composite SCs for the treatment of primary incisors with large or multi-surface caries was excellent. Parents' dissatisfaction was most often related to color of the restorations. However, this did not affect their overall satisfaction with the crowns. The durability of restorations negatively affected the rating of overall satisfaction with the crown. Durability seems to be of more concern than excellent color match to this group of parents. (*Pediatr Dent.* 2004;26:337-340)

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Among the concerns of the dentist placing bonded resin composire strip crowns (SC) are the longevity and appearance of these crowns, which can be very esthetic yet are also technique-sensitive restorations. In addition, the clinician must consider parental satisfaction with their child's postoperative appearance and smile. In a previous article, the clinical and radiographic success of the treatment of maxillary anterior primary incisors with bonded resin composite SCs was evaluated.[1] It was reported that bonded resin composite SCs performed well for restoring primary incisors with large or multi-surface caries. The color match of these crowns with adjacent teeth was significantly reduced when placed upon teeth that have undergone pulpectomy treatment and had been obturated with an iodoform paste. Otherwise, color match was judged as being "very good."

There are no reports in the literature that question parents' satisfaction with bonded resin SCs for their children. Nor is it known to what degree color match, overall contour, or failure rate affect the parent's level of satisfaction.

Therefore, a retrospective clinical study was designed to evaluate these issues. The purpose of the current study was to evaluate parental satisfaction of bonded resin composite SCs for the treatment of maxillary anterior primary incisors and compare it with the crowns' clinical evaluation as judged by pediatric dentists.

Table 1. Evaluation Criteria for Clinical Photographic Assessment

	Color match
A	No noticeable difference from adjacent teeth
B	Slight shade mismatch
C	Obvious shade mismatch
	Crown contour
A	Crown appears very cosmetic, nicely contoured and natural looking
B	Crown appears acceptable, but could have been contoured better, perhaps longer, shorter, fatter, thinner
C	Crown not esthetic, detracts from appearance of the mouth
D	Crown not present
	Presence of restoration failure
A	Crown appears normal: no cracks, chips, or fractures
B	Small but noticeable areas of loss of material
C	Large loss of crown material
D	Complete loss of crown

Methods

This study was designed to evaluate the parental satisfaction with SCs that had been placed in a private practice, in healthy middle-class and upper-class preschool children who had been treated for dental caries or trauma of the primary maxillary anteriors over a period of 4 1/2 years. This was a retrospective clinical study. The study sample comprised patients who had carious primary incisors or who had sustained trauma to their incisors requiring treatment. The participants returned for at least one 6-month recall examination and their parents consented to participate in the study. Photographic examinations of the restored teeth were used for evaluation by 2 independent clinicians. The principal investigator placed all of the restorations using a standardized crown placement protocol. The clinical technique and procedure were described in detail in a previous report.[2]

Briefly, following caries excavation and removal, strip crowns (3M-ESPE Dental Products) were fitted. In cases of very deep caries, an application of a resin-modified glass ionomer liner/base (Vitrebond, 3M-ESPE Dental Products, St. Paul, Minn) was applied prior to crown fitting for pulp protection. A gel etching agent (Ultra-Etch, Ultradent Products, South Jordan, Utah) was placed for 15 seconds and rinsed. A bonding agent (Single Bond, 3M-ESPE Dental Products, St. Paul, Minn) and resin composite restorative (Z100 Restorative Extended Range Shade-Pedo Paste, 3M-ESPE Dental Products, St. Paul, Minn) were used according to the manufacturer's instructions.

Restorations were placed on carious primary incisors with extensive caries on 1 surface or moderate carious lesions on 2 or more surfaces. Additionally, adequate tooth structure after caries removal was required to ensure sufficient surface area for bonding. Uncooperative and precooperative children were treated with conscious sedation in a standardized method described fully in a previous study.[3] The method included the use of oral premedication, nitrous oxide inhalation, and passive restraint using a papoose board.

Crowns were photographed at a standard distance and the images were processed in a standardized method during a routine recall examination. The restorations were photographed to allow a blind evaluation of their clinical appearance and the gingival health surrounding the crowns by 2 independent raters (not associated with the principal investigator's practice) without the presence of either the patient or operator. An evaluation rating system was devised similar to the US Public Health Service (USPHS) criteria rating system.[4] The photographic examination included an evaluation of the color, shape, and integrity of the SC. The criteria for the clinical evaluation are described in Table 1. Two evaluators rated the images independently. Interexaminer ratings were found to be in 80% agreement and, when different, were found to be only one ranking apart. When ratings were not in agreement, the 2 examiners reviewed the photograph together and reached a consensus rating. The detailed results of the clinical and radiographic success of these restorations were previously published.[1]

To determine parental satisfaction, a survey was conducted at the recall examination among parents of all participating subjects. Parents of the children participating in the study were given a questionnaire designed to evaluate their satisfaction of the restorations on their child. This questionnaire was similar to one used by Roberts et al[5] in their study of parental satisfaction of resin-coated steel crowns. Parents were asked to score parameters such as the crown's color, size, durability, and their overall satisfaction on a scale of 1 to 5, with 1 being "very unsatisfied" and 5 being "very satisfied." Durability was defined as the ability of the crown to be retained on the tooth without fracture and ability to function well. A trained dental assistant explained the questionnaire to the accompanying parent.

The parent's answers were given verbally and recorded by the dental assistant. The dentist was not present during the parent's evaluation, and parents were reassured that their answers would be anonymous to the dentist. The parents evaluated their child's restoration directly and not from a photograph.

The Fisher's exact test was used to check for differences between dentist and parent evaluations and any significant relationships between parent ratings of appearance, color, size, and overall satisfaction. Linear regression analyses were utilized to examine the significance of the recall time and parental ratings.

Results

There were 112 restorations placed in 40 children. The restorations were evaluated after the crowns had been in place for an average of 18 months (range=6-25 months). The study sample and its characteristics are shown in Table 2. The clinicians' evaluations of color, crown contour, and retention (durability) are presented in Table 3. Parental satisfaction questionnaires were completed for all 40 children. Results

Table 2. Sample Characteristics

Age (months) at time of treatment (mean, ±SD)		39.2±10.3			
Gender		**M**	26		
		F	14		
Recall x=17.8	**Months**	6	7-12	13-24	>25
	Number of restorations	27	24	32	29
Number of restorations		112			

Table 3. Clinical Evaluation of Restorations

	Clinical evaluation of restorations N (%)		
Rating	**A**	**B**	**C**
Color match	83 (74)	23 (21)	6 (5)
Crown contour	71 (63)	38 (34)	3 (3)
Restoration failure	98 (88)	11 (10)	3 (2)

Table 4. Parental Ratings of Satisfaction

	Rating N (%)				
Category	**1**	**2**	**3**	**4**	**5**
Appearance		1 (3)	2 (5)	11 (28)	26 (65)
Color		1 (3)	6 (15)	10 (25)	23 (58)
Size		1 (3)	2 (5)	9 (23)	28 (70)
Restoration failure (durability)	1 (2.5)	3 (8)	4 (10)	5 (13)	27 (68)
Overall satisfaction			3 (8)	6 (15)	31 (78)

1=very unsatisfied, 5=very satisfied

of the parental satisfaction survey are presented in Table 4. When considering the parental ratings for appearance, color, size, and durability, parents were most satisfied with the size and overall appearance of the restorations. The lowest scores were for color match. But in spite of these lower scores, most parents still showed an overall positive rating of the crowns.

For comparison between parental ratings and those of the dentists, when multiple restorations in a single patient were evaluated by the dentist, only the restoration that was rated the least favorable was used. No differences were found between dentist and parent evaluations of color, size, and overall appearance (Fisher exact test; *P*=.194, .776, .291, respectively). Parents evaluated their child's restoration similarly at various recalls with no relationship found between time of recall and evaluation of color, size, and overall satisfaction (linear regression analysis; *P*=.391, .347, .568, respectively). Even if parents had lower satisfaction scores of color, size, or overall appearance, they still generally rated their overall satisfaction with the SCs as positive. However, a significant relationship was found between durability (retention) and overall satisfaction (*P*=.046). Parents who were not satisfied with the durability (eg, the crown fractured) reported less overall satisfaction with the crowns.

Discussion

Interest in patient satisfaction with various aspects of health care has grown over the past 20 years.[6] As the population becomes more conscious of esthetics, parents demand an esthetically pleasing anterior restoration for the treatment of primary incisor teeth.[7] However, the clinician should be aware that parents' standards and demands may not match his or her expectations of what the final esthetic outcome may be. The way parents view their child's restored teeth may be different than the clinician's point of view. When evaluating the clinician's work, parents will take into consideration the starting point of the teeth. The preoperative appearance of their child's discolored and frequently black teeth and the thought that extraction may be the only alternative is compared within their minds to the child's post-treatment smile restored with resin crowns.

Additionally, what is important to the clinician may not necessarily be to the parent. To the dentist, ease of treatment and esthetic appearance may be of paramount importance, while to the parent, durability and cost of treatment may be of most concern. Therefore, even if the crowns are not as esthetically pleasing to the discerning eye of the clinician, the parent may express high satisfaction because the teeth were able to be retained and restored to a resemblance of natural appearance, when the parents felt the teeth were going to need to be extracted.

When parents state their overall satisfaction, they often include many dimensions of treatment that the clinical evaluation may not include. Parents may cognitively construct their experience with their child's treatment in 3 distinct ways.[6] Parents evaluate: (1) psychosocial outcomes; (2) clinical outcomes; and (3) the treatment process. Therefore, one may explain the results of this study in which parents may have been dissatisfied with the color of their child's restoration, yet the same parents rated overall satisfaction as being excellent (Figures 1-3). The durability and psychosocial benefits outweighed the visible clinical outcome. Also, as aforementioned, a child with anterior teeth restored with resin bonded composite crowns, no matter how well they are done, will almost always look better than before they received treatment—even if by pediatric dentistry standards the clinical result was poor.

Another aspect to consider is that, for many parents, it may be very difficult, if not impossible, to obtain negative impressions of such care since the parents were given a choice of treatment modes and chose SCs for their child's treatment. Strong psychological forces mitigate against negative evaluation of a decision made by free choice.[6] For example, when parents choose to pay large sums of money for orthodontic treatment at a popular, highly regarded practice, they will be strongly motivated to seek out information that confirms the wisdom of their choice, and ignore information that would

Figure 1. An example of a case marked both by parent and clinician with high satisfaction.

Figure 2. The right central was rated by parents as low both in durability and overall satisfaction.

Figure 3. An example of a restoration rated by the parent as successful in overall satisfaction, yet low in color and appearance.

suggest their choice was a poor one. Only when there is a large discrepancy between expected and perceived performance (eg, the crown fell off within a few months of treatment) will dissatisfaction result. It is, therefore, highly recommended to advise and educate parents regarding the various treatment options available for the treatment of their child and help assist them in the decision-making process, but not to make the decision for them. When they are educated about the pros and cons of treatment and then make the choice on their own, they are less likely to express dissatisfaction with results since they were the ones choosing the treatment.

The questionnaire was completed by the dental assistant, not in the presence of the dentist. This was done to avoid the possibility that the dentist's presence may have caused parents to feel pressure to produce more positive ratings. The results suggest that parents were not coerced into higher ratings as evidenced by the parents whose children had suboptimal results and who felt free enough to make their ratings reflect this fact.

In a similar study examining prefabricated resin-faced stainless steel crowns,[5] although an overall high level of parental satisfaction was reported, the lowest satisfaction was for the crown's esthetics. Concerns expressed by parents included large size, color, and visualization of some metal. In this study, the single most important factor affecting parental satisfaction with treatment was the durability or retention of the restoration, even though only 12% of the restorations demonstrated some loss of material and none of the crowns were completely lost. Parents seemed to be willing to compromise with regard to color, shape, and appearance, but their overall satisfaction was affected by failure of the restoration. This is an important issue for the clinician to note. When all other things are equal, placing the most durable restoration may be what leads to the least parental dissatisfaction with treatment.

Conclusions

Overall parental satisfaction with bonded resin composite strip crowns for the treatment of primary incisors with large or multi-surface caries is excellent. When asked to rate color, durability, size, and overall satisfaction, parents were most likely to be least satisfied with the color of the crowns. This, however, did not affect their overall satisfaction. Parents who were not satisfied with durability demonstrated significantly lower satisfaction with the crowns overall.

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