

Perceived outcomes and parental satisfaction following dental rehabilitation under general anesthesia

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Abstract

Purpose: The objective of this study was to evaluate parents' perceptions of their child's quality of life following dental rehabilitation under general anesthesia and to assess their satisfaction with that treatment modality.

Methods: A survey was sent to 400 parents of patients who had undergone dental rehabilitation. Quality of life outcomes, such as continued presence of pain and inability to eat or sleep, were assessed. Additionally, parental satisfaction with outcomes and processes was evaluated, as was outcome expectation. Descriptive statistics were collected on outcome measures. Contingency testing was employed to compare outcomes by medical or developmentally compromising conditions, gender, or continued use of the initial treatment facility for routine care.

Results: Fifty seven percent of parents returned surveys. A descending hierarchy of improved treatment outcomes was noted, with improvement in pain the predominant outcome, followed by improved abilities to eat and sleep, reported by 86, 69, and 41% of parents, respectively. 72% perceived an improvement in their child's health. Children with medically or developmentally compromising conditions were significantly more likely to have improved abilities to eat and sleep, and had a significantly improved overall health status. Satisfaction and expectations were consistently achieved and were not related to continued use of the initial treatment facility.

Conclusions: Children with early childhood caries receiving comprehensive treatment under general anesthesia achieved improvements in their quality of life as well as overall health. A hierarchy of improvement was noted, with the greatest improvement noted in pain experience followed by improved abilities to eat and sleep. Parents were overwhelmingly satisfied with outcomes and the process of care, and reported that their expectations had been met. (*Pediatr Dent* 23: 419-423, 2001)

The Surgeon General's Report on Oral Health highlighted the relationship between oral health and general health and placed emphasis on quality of life issues that are associated with oral and dental diseases. The milestone report recognized that dental caries, particularly in young children, can be associated with diminished quality of life, not only for the affected children, but also for their families, as well.¹

Case reports have demonstrated that early childhood caries may impact upon weight gain, while therapeutic intervention

can produce the phenomenon of "catch up growth."^{2,3} Children with early childhood caries and pulpal involvement of at least a single tooth have been demonstrated to weigh less than age- and sex-matched patients,⁴ while exhibiting significant catch-up growth following complete dental rehabilitation.⁵ The dynamic nature of the impact of early childhood caries is evident when examining the age-adjusted weights of children with nursing caries is examined. Older children tend to be in lower percentile weight categories, consistent with anecdotal reports by parents regarding their child's late but progressive onset of pain, inability to eat, and inability to sleep.

There are numerous behavioral and therapeutic approaches to the management of early childhood caries.^{6,7} For many young children with extensive dental involvement, however, comprehensive oral rehabilitation under general anesthesia in a controlled environment such as a hospital setting is required to provide quality dental care for the child in an environment that promotes patient safety, efficiency, and efficacy of dental care. Although this approach to care is effective, it is very often considered to be the last resort in a continuum of options due to the expense, risk-benefit considerations and acceptability to parents. In studies that have examined a hierarchy of behavioral techniques, general anesthesia has been consistently acceptable to parents, but was also viewed as a technique of last resort.⁸⁻¹⁰

The effect of early childhood caries on the quality of life in young children has only recently been explored.¹¹ The presence of adverse changes in such quality of life issues as oral pain and the inability to eat or sleep has been demonstrated, as has the beneficial effect of comprehensive oral rehabilitation.^{11,12}

In many disciplines, patient satisfaction has been demonstrated to be associated with long-term compliance with treatment and prevention recommendations. Gerbert et al reported that patient satisfaction influences both re-enrollment in health plans and return visits to specific health care providers.¹³ Others have reported relationships between attitudes and use or non-use of dental services.^{14,15} In Sheehy's study of children who had undergone comprehensive oral rehabilitation with general anesthesia, 77% of parents of children reported back for six month recalls and reported a decrease in sugar intake following the rehabilitation, demonstrating the potential for behavioral changes,¹⁶ as well as the potential to comply with

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Table 1. Quality of Life and Satisfaction Outcomes – The Effect of Underlying Medical History.

Medical or Developmental Compromise?	Pain Improved (%)	Eating Improved (%)	Sleeping Improved (%)	Overall Health Improved (%)	Overall Positive Experience (%)	Expectations Met (%)
Yes	77 (89%)	67 (77%) *	44 (51%) *	71 (82%) **	85 (98%)	84 (97%)
No	114 (84%)	86 (63%)	47 (35%)	89 (65%)	133 (98%)	132 (97%)
Totals	191 (88%)	153 (69%)	91 (41%)	160 (72%)	218 (98%)	216 (97%)

*p < 0.05

**p < 0.01

recall protocols. However, children and families at greatest risk for early childhood caries appear to have poor long-term compliance and are at high risk for continued dental disease.¹⁷

Treatment outcomes for children receiving care under general anesthesia have been shown to be dependent upon procedure performed as well as materials utilized.^{18,19} However, treatment outcomes are not limited to therapeutic or technical procedures, and should include consideration of quality of life factors.²⁰ Despite long professional acceptance of general anesthesia as a treatment option for young children with advanced dental caries, there has been little investigation of quality of life outcomes. Additionally, parental satisfaction with outcomes and processes have received little attention.

The objective of this study was to evaluate parents' perceptions of patient outcomes following complete dental rehabilitation under general anesthesia and to assess their satisfaction with that modality of treatment.

Methods

A survey was administered to 400 parents of patients who were treated for dental rehabilitation under general anesthesia at the Children's National Medical Center in Washington, D.C. Surveys were either mailed within 10 days of procedures to parents of patients treated over the 24 month data collection period, or administered at the time of the routine follow-up visit. Follow-up mailings were not undertaken.

All patients enrolled in the study received comprehensive dental treatment in the hospital operating room by a team comprised of a faculty attending and two pediatric dentistry residents. There were no exclusions on the basis of payment source, with coverage predominantly provided by Medicaid plans from the District of Columbia, Maryland, and Virginia. Patients that had previously undergone dental rehabilitation were not eligible for participation in this study, thereby minimizing the influence of older patients with non-acute presentations and medically compromising conditions.

Parents were asked to complete a single page survey that sought their perceptions of treatment outcomes that were related to quality of life such as pain, sleeplessness, and the inability to eat. Parents were asked to indicate whether they perceived improvement, no change, or worsening of these conditions. Additionally, expectation and satisfaction outcomes were surveyed, in a simple dichotomous fashion.

Patients were categorized upon the presence of significant medical or developmentally compromising conditions. With the exception of patients with mental retardation, autism, or profound communications disorders, patients categorized as either ASA I or ASA II, including mild systemic diseases such as asthma and heart murmur, were not considered to have significantly compromising conditions. Although specific

information regarding the underlying compromise was recorded, only the presence or absence of such conditions was considered in subsequent analyses.

The survey was designed such that the initial choice among the available options represented a negative outcome or experience.

Descriptive statistics were used to portray the perceived quality of life outcome measures and parental satisfaction. Chi-square analyses were performed on data when stratified on the basis of medical diagnosis, gender, and continued utilization of the initial treating facility.

Results

Two hundred and twenty eight surveys (57%) were completed by parents either through return mail or at the time of routine follow-up. Five of these surveys could not be included in subsequent analyses because of errors or omissions in their completion. Of the 150 surveys that were mailed to parents, only 72 were completed. Of those, only 13 were returned through the mail, the remainder being returned at the time of the scheduled follow-up visit. There were no differences in any of the measured outcomes on the basis of method of survey return.

Thirty-nine percent (N=87) of the patients had a significantly compromising medical or developmental condition, in addition to their dental presentation, and 70% of the patients continued to receive their oral health care at Children's National Medical Center following completion of their initially extensive treatment protocols.

Age and gender

The mean age of the patients at the time of completion of procedures was 42 ± 9 months. The mean age at the time of survey completion was 43 ± 10 months. The mean age of patients with medically of developmentally disabling conditions was 43 ± 13 months, compared to 41 ± 6 months for patients with non-contributory medical histories. These differences were not significant.

Fifty two and a half percent of the patients were male, while 48% were female. There were no differences noted in age distribution or medical history on the basis of patient gender.

Quality of life outcomes (Table 1)

There was a hierarchy in perceived improvements in quality of life. Improvements in pain, eating, and sleeping were reported by parents to be 86%, 69%, and 41%, respectively.

Seventy two percent of responding parents believed that the overall health of their child had improved as a result of comprehensive dental intervention.

There were no reported differences in quality of life outcomes based upon whether the children were continuing to receive follow-up care at the study site.

The effect of medical history (Table 1)

Children with significantly compromising medical or developmental conditions were significantly more likely to have improvements in “ability to eat,” and “ability to sleep,” reported. Such improvements were respectively noted in 77% and 51% of patients with compromising conditions, compared to 63% and 35% in patients with non-contributory histories. Additionally, parents perceived that the overall health of their children with such compromising conditions was significantly improved when compared to children with non-contributory medical histories.

There were no differences noted in the satisfaction parameters on the basis of medical history, nor was there any difference in the continued use of the initial treating facility.

Satisfaction (Table 2)

Parents reported a high degree of satisfaction with the treatment outcomes. When offered dichotomous choices, parents overwhelmingly indicated that the overall experience was “good” and that expectations had been met. However, 36% indicated that if a safe and effective sedation alternative was available, albeit requiring two or more visits for completion of treatment, they would have considered that alternative.

There was no difference on satisfaction measures based upon whether the children were continuing to receive follow-up care at the study site. Among parents that reported dissatisfaction with their experience or unmet expectations, there was no difference in their rate of continued use of the comprehensive care treatment facility when compared to parents that reported satisfaction.

The effect of sex

There were no differences noted in any of the quality of life outcomes or satisfaction measures on the basis of the sex of the child. Neither were differences noted when medical history is further stratified by patient gender.

The effect of willingness to consider alternatives to general anesthesia

Thirty six percent of parents responded that they would consider a safe sedative agent as an alternative to general anesthesia, even if it required two or three visits to complete treatment. There were, however, no differences noted in the perceived quality of life outcomes or on satisfaction measures, on this basis.

Discussion

Studies of this nature, which seek to survey satisfaction, may be affected by halo and acquiescence bias.²¹ Although in-house surveys have the potential for bias, because patients are reluctant to complain, truly dissatisfied patients are more likely to seek care elsewhere, and are less likely to be compliant for follow-up.²² Thirty percent of the responding parents reported that their children were not utilizing the study site for

their child’s continuing care. There were, however, no differences noted in the reported quality of life outcomes or in satisfaction outcomes based upon continued use of the initial treating facility. At the time of the study, many patients received their dental care under third party coverage that mandated primary care services to be provided by a general dentist, with pediatric dentists able to provide care only following authorized referral and treatment plans. Despite a very high rate of satisfaction, such patients were required to return to their “primary care dentist” for on-going care.

In a study by Kress, Ferraro, and Stiff, a prolonged course of treatment was a source of dissatisfaction to patients seeking dental care.²³ Providing comprehensive and definitive oral health services to children during a single session, as is done in the operating room environment, may offer an alternative to prolonged treatment protocols, perhaps even offsetting concerns about safety. However, the delay in receiving such comprehensive treatment may be considerable, even exceeding six months.¹¹ Thirty six percent of the parents surveyed in this study responded that they would consider a prolonged treatment course, such as with a safe sedative agent, as an alternative to general anesthesia.

Apparently, however, the suggestion that these parents would consider an alternative to general anesthesia was not reflective of any difference in their perceived quality of life outcomes or of any dissatisfaction with outcomes.

Kress and Shulman, in a review article, believed that the medical model of care had established an association between patient satisfaction and compliance for subsequent care.²⁴ In the current study, 57% of the patients responded to the initial survey request. Although this figure is lower than that reported in a study of Canadian children undergoing general anesthesia for dental care, repeated telephone contact attempts had been employed.¹¹ In compliance studies observed in similar American populations prior to designated provider models of care, return to the original treatment facility within a specified period of time ranged from 29% to 51%.^{18,25} In a mailed survey, similar to the current study, a 42% return rate was achieved.²⁶

It is clear, however, that the technical components of treatment are not necessarily perceived as the most important determinants of quality, nor do they necessarily contribute in a disproportionate manner to a patient’s level of satisfaction.²⁷ In fact, if satisfaction was measured on the basis of technical outcomes, results for children receiving dental rehabilitation would not be as positive as indicated in this study.

Previous investigations assessing survival rates or success outcomes for various dental restorative procedures performed under general anesthesia indicated a high rate of restoration failure and subsequent need for re-treatment.^{16,18,19,28} Clearly, parents view the renewed abilities to eat and sleep and new found freedom from pain as the determinants of satisfaction.

Table 2. Satisfaction Outcomes

Continuing Care at Site of Initial Comprehensive Treatment?	Overall Positive Experience (%)	Expectations Met (%)	Sedation Option (%)
Yes	155 (99%)	156 (98%)	58 (37%)
No	63 (96%)	60 (94%)	23 (35%)
Totals	218 (98%)	216 (97%)	81 (36%)

In this population of children, “quality of life” issues are interchangeable with an individual’s health, whereas a failed restoration is an intangible, perhaps with little perceived consequence. Although only 57% of the parents complied with the current study, the reported improvements in quality of life are consistent with somatic effects that have been documented in case reports and longer term follow-up studies.^{2,3,5}

The satisfaction expressed by parents can have only a positive impact on the likelihood of returning for continuing care. However, that reasoning is not consistently borne out in reality.^{18,25} Although there is much speculation regarding the reasons for poor follow-up compliance on the part of patients that have undergone comprehensive dental rehabilitation, the tangible impact of such intervention may represent an ending point for parents, particularly if their child had been visibly suffering and exhibiting a deteriorated quality of life. Although recidivism and relapse have been noted in such patient populations,²⁹ the acuity and enormity of the initial presentation are, for most affected patients, singular events that were managed in an efficient fashion in the operating room.

Despite what will likely be a lifelong burden, the early and comprehensive nature of the intervention is perceived to be closely linked to overall health and is highly valued by parents. The ability, however, to so dramatically, successfully, and predictably restore health, may, in part, account for the difficulties reported in maintaining oral health in at risk populations. With the perceived availability of a valued and effective intervention, the need to actively participate in one’s own healthcare, or the health care of one’s child, may be considered immaterial or unnecessary. Further investigation may be warranted to assess why compliance in maintaining oral health may be diminished, even when there is high satisfaction with outcomes and the consequences of poor oral health are well known to parents.

Conclusions

1. Parents perceive improved quality of life in their children following comprehensive dental rehabilitation;
2. There is a hierarchy of improvement, with the greatest improvement noted in pain experience, followed by improved abilities to eat and sleep;
3. Parents believe that overall health is improved following comprehensive dental rehabilitation;
4. Parents express strong satisfaction with post-rehabilitation outcomes; and
5. Children with underlying medically or developmentally compromising conditions are more likely to have reported improvements in eating, sleeping, and overall health.

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Letter to the Editor



The Hand Over Mouth Exercise

I am writing in regard to the article in *Pediatric Dentistry*, July/August 2001 Volume 23 No. 4. This is the article on the twenty-year perspective "The changing use of hand over mouth" by George Acs *et al.*

I must admit that articles that continue to show up every ten years about what methods and attitudes are being taught are getting a little tedious to read. It seems as though we spend a lot of time and years reviewing perspectives about what is being taught with references about what we "think" the effects of "hand over mouth" might be, instead of studying the actual procedure and its effects over the same number of years.

In 1993, we published an article in this journal, "Dental attitudes and memories: a study of the effects of hand over mouth/restraint."¹ To my knowledge, it is the only article that actually talked to children a number of years after the procedures. Why are we not following up with more studies that actually talk to children to see if we can determine what their actual experience is five, ten, and twenty years later? Even when our article is briefly referred to in this present study it is followed by a reference to the Milgrom Study on the "theoretical implications" of dental fears and control.

Again, I say we have literally thousands of children that have now experienced those kinds of behavior modification techniques for the past thirty years. Yet, no one is doing research today to try and follow up on those specific cases. Instead, we get articles talking about the attitudes of people running graduate programs and the attitudes of the public. We certainly have the cases that can be studied, and we should be able to say definitively, sometime in the 21st century, that these behavior modification techniques are detrimental to the child's well-being or they are not.

It is interesting that the article following that article is about "Conscious sedation experience in graduate pediatric dental programs." In the abstract, I note, "more lecture hours were being spent on conscious sedation than ten years ago." It looks as though what is happening is that we are not teaching our graduate students anything about behavioral modification but we are spending more time teaching them how to control children by using drugs such as Chloral hydrate or Midazolam. The question needs to be asked and answered definitely as to whether a four-year-old child is better off in the hands of someone who understands the proper use of hand over mouth/restraint, where having a ten-second episode to control behavior, is better than the child being drugged and having the body chemistry changed so as to get the dentistry done.

Let us stop wasting time with theoretical implications. We need three or four additional studies, like our 1993 "hand over mouth" article, to establish definitely whether such behavior modification techniques have negative consequences or not.

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