

A survey of parents whose children had full-mouth rehabilitation under general anesthesia regarding subsequent preventive dental care

Evelyn Sheehy, BDS, FDS (RCS) Kikuko Hirayama, DDS, DMD Anthi Tsamtsouris, DMD, MS

Introduction

General anesthesia (GA) is a treatment modality for very young children who require extensive dental treatment, are fearful, and are medically compromised. It is relatively safe when administered in a hospital setting, but is not without risk of complications.^{1,2}

Successful outcome of full-mouth rehabilitation for the pediatric dental patient under GA depends on the expertise of the medical and dental team and the ability of parents or caretakers to comply with preventive dental care for their children following GA.

Legault et al.³ reported in a follow-up analysis of 217 children treated under GA that 84 (38.6%) required further dental treatment within 15.6 months of initial treatment. Nine (10.7%) needed retreatment under GA because of severe management problems or failure to carry out preventive or maintenance measures.

O'Sullivan et al.⁴ reported similar findings. In his study, 80 children received comprehensive dental care under GA and were followed for a minimum of 2 years after the procedure. Seven of 80 (8.75%) patients required retreatment, and only two patients needed more restorative treatment under GA (2.5%).

Roberts⁵ stated that providing dental care for children under GA is an important service. However, only 36 children (26%) received preventive therapy after GA, although 141 (100%) children received some preventive advice from the consultant dental practitioner at the time of assessment. Once the treatment was completed, parents did not see the need for homecare prevention and failed to keep appointments specifically set for preventive therapy.

Other reports in the literature confirm that children with high initial rates of dental decay tend to have greater increases in incremental decay in subsequent years. Johnsen et al.⁶ compared, on recall, children who had nursing caries to a group who were initially caries free for occurrence of lesions in approximal molar surfaces. At follow-up examination 36–45 months later, 53% of nursing caries children had one or more approximal molar lesions compared with 15% of children who were initially caries free. Silver et al.⁷ stated poor feeding practice in infancy should be considered as an indication of high risk to caries for both the pri-

mary and permanent teeth. Scavos et al.⁸ compared the nursing bottle group and the control group as to future caries development and found that despite increased preventive care, the nursing bottle group had a higher susceptibility to dental caries.

A review of the literature reveals no report on preventive dental care of parents/caretakers for their children following full-mouth rehabilitation under GA. The purpose of this study was to evaluate by telephone interview the self-reported compliance of families with preventive dental care, including follow-up visits, for their children who had full-mouth rehabilitation under GA.

Methods and materials

Complete records of 77 patients who attended New England Medical Center in Boston for dental treatment under GA were included in the survey. Prior to GA, preventive dental care, which included oral hygiene instruction, diet consultation, nursing bottle use, fluoride consultation, and 6-month recall system, was given to the parents and children. The patients were instructed to have followup 1 week after the operation and every 6 months thereafter.

Parents of 44 (57%) of these patients were interviewed by one investigator. The remaining parents could not be contacted for reasons such as disconnected phones or changed addresses. Standard questions concentrated on the following areas: dental follow-up appointments, patients' dietary and oral hygiene habits, and fluoride use.

Data were collected from the records of the 44 children including age, sex, past dental history, past medical history, payment method, indications for and treatment carried out under GA, and follow-up visit.

Results

Of the 44 patients reviewed in the survey, 30 were males and 14 were females with a mean age of 4 years and 6 months at the time of the GA. Mean time elapsed after GA was 14 months. Twenty-four patients (55%) had a history of nursing caries. Twelve patients (27%) were behavioral management problems or patients requiring extensive treatment. Eight patients (18%) were medically compromised (Table 1).

Table 1. Reasons for treatment under general anesthesia

Reasons	Number of patients	(%)
Nursing caries	24	(55%)
Medically compromised	8	(18%)
Extensive treatment/ management problems	12	(27%)
Total	44	(100%)

Table 2. Type of payment related to patients returning for recall visits

Follow-up	Medicaid	Cash/Insurance	Total
Consistent	17 (71%)	17 (85%)	34 (17%)
Inconsistent	7 (29%)	3 (15%)	10 (23%)
Total	24 (55%)	20 (45%)	44

Table 3. Report of who brushes the child's teeth

Person	Number	(%)
Child alone	14	(32%)
Child and parent	22	(50%)
Parent only	8	(18%)

Dental visits following GA

Thirty-four patients (77%) had regular 6-month dental appointments following GA. However, 10 patients (23%) had not visited their dentist regularly since GA. Twenty-four patients (55%) used Medicaid and 20 (45%) used cash or insurance (Table 2). Comparing the type of payment with the number of patients returning for 6-month dental visits following GA revealed that 17 cash/insurance patients (85%) had regular 6-month dental appointments following GA. Seventeen Medicaid patients (71%) had regular dental appointments following GA. Whether the patient returned for recall was significantly related to the type of payment received (chi-square analysis). Ten patients (23%) needed fillings or extractions since the GA procedure. All of the patients received treatment in the dental operatory without GA.⁷

Dietary habits since GA

Since GA, 34 parents (77%) reported that they had reduced the frequency of sugar consumption of their children. However, 10 parents (23%) said there was no change in diet or sweet consumption. Of the 16 patients who had nursing caries, one

child still continued bedtime use of a bottle containing plain water only.

Oral hygiene practices

Results regarding oral hygiene practices for the children are given in Table 3. Daily tooth brushing was reported to be carried out by parents for 30 (68%) of the children. Fourteen (32%) of the 44 children brushed daily on their own. Parents reported that their children's teeth were brushed an average of twice a day.

Fluoride use

Results regarding the type of drinking water consumed and the use of fluoride tablets and mouth rinses/gels are given in Table 4. Thirty children (68%) lived in optimally fluoridated areas. Seven of these also used bottled water for drinking purposes. Fourteen children (32%) lived in nonfluoridated areas, two of whom used bottled water also. The majority of bottled water contained less than 0.3 ppm of fluoride. Of 14 children living in nonfluoridated areas, seven did not take fluoride at all. Six reported using fluoride tablets. However, on further questioning, use of fluoride tablets was inconsistent in three of these cases. Daily use of brush-on fluoride gels/rinses was used by one child living in a nonfluoridated area and nine children living in optimally fluoridated areas.

Discussion

This report highlights the extensive treatment carried out under GA for very young children. GA was essential to treat all of these patients. Ten patients (23%) required further restorative treatment or extractions at follow-up visits an average of 14 months after treatment under GA. This confirms findings of Legault³ and O'Sullivan.⁴ However, unlike these studies, none of the patients in this study was retreated under GA.

Of the families surveyed, 77% of children returned for routine 6-month follow-up appointments. Type of payment received from the 44 patients was related to the rate of return for recall; more cash/insurance patients returned for routine recall visits than Medicaid

Table 4. Relationship between the type of water supply and the use of fluoride tablets and rinses/gels

Water supply	No F	F tablets daily	F tablets not daily	F gels/rinses
F-water supply*	21	0	0	9/30 (30%)
tap water only	23 (52%)			
tap/bottle water	7 (16%)			
NonF-water supply [†]	7	3/14 (21%)	3/14 (21%)	1/14 (7%)
tab/well water	12 (27%)			
tap/bottle water	22 (50%)			

* F-water supply: optimally fluoridated water.

[†] NonF-water supply: less than optimally fluoridated water.

patients, which is contrary to the findings of Enger,² who found no significant difference between the type of payment received and the return for recall. In the same study, significantly more Medicaid and no-charge patients returned for recall at a different hospital.

A diet diary was not included in the survey. However, about 77% of parents reported that they reduced the frequency and amount of sugar consumed by their children. It is difficult to draw accurate conclusions from this information alone. Nevertheless, after the preventive instruction, one child was still using a bottle with water.

While the childrens' daily tooth brushing frequency was satisfactory, tooth brushing effectiveness may be questionable due to the fact that mean age of the children was 4 years 6 months and some were disabled. Still, 14 of the children (32%) were reported to brush their teeth by themselves. It is generally accepted that preschool children lack the ability to brush their teeth adequately and that parental involvement is essential to improve efficiency.⁹⁻¹¹ This is also true of all severely disabled individuals who may lack the motor skills needed to brush their teeth by themselves.

Nine children (30%) living in fluoridated areas and one child residing in a nonfluoridated area used daily fluoride rinses/gels. Only three patients (21%) living in nonfluoridated areas took fluoride tablets daily and another three patients took fluoride tablets inconsistently. These findings suggest that a high degree of parental motivation may be necessary to implement successful home-based daily use of fluoride tablets.

Combined fluoride therapy regimens may be considered for these children but concern regarding the risk of developing dental fluorosis has to be taken into account, especially in children younger than 4 years of age.¹²⁻¹⁵

Twenty-one percent of children surveyed used bottle and tap water for drinking purposes. Stannard et al.¹⁶ have shown the variability of fluoride concentration in bottle water. Therefore, this is another factor that should be considered when prescribing fluoride.

Caries risk patients identified from this study are patients who continued unfavorable eating patterns, had marginal fluoride exposure, and had unsupervised daily tooth brushing. Therefore, we have to emphasize preventive care to the parents and children and monitor them closely.

Limitations of this survey include the fact that parents of the 44 children surveyed may not be representative of the total group of 77. A longer follow-up period of the children also would be more desirable.

Dr. Sheehy is a clinical instructor, Dr. Hirayama is a clinical assistant professor, and Dr. Tsamtsouris is a professor in pediatric dentistry at Tufts University School of Dental Medicine, Boston, Massachusetts. Reprint requests should be sent to Dr. Hirayama, Department of Pediatric Dentistry, Tufts University School of Dental Medicine, One Kneeland Street, Boston, MA 02111. Phone: 617-956-6971

1. Libman R, Cooke JM, Cohen L: Complications related to the administration of general anesthesia in 600 developmentally disabled patients. *J Am Dent Assoc* 99:190-93, 1979.
2. Enger DJ, Mourino AP: A survey of 200 pediatric dental general anesthesia cases. *ASDC J Dent Child* 52:36-41, 1985.
3. Legault JV, Diner MH, Auger R: Dental treatment of children in a general anesthesia clinic: review of 300 cases. *J Can Dent Assoc* 6:221-24, 1972.
4. O'Sullivan EA, Curzon MEJ: The efficacy of comprehensive dental care for children under general anesthesia. *Br Dent J* 171:56-58, 1991.
5. Roberts GH: Caries and the preschool child: treatment of the preschool child in the hospital service. *J Dent* 18:321-24, 1990.
6. Johnsen DC, Gerstenmaier JH, Di Sanis TA, Berkowitz RJ: Susceptibility of nursing-carries children to future approximal molar decay. *Pediatr Dent* 8:168-70, 1986.
7. Silver DH: A longitudinal study of infant feeding practice, diet and caries, related to social class in children aged 3 and 8-10 years. *Br Dent J* 163:296-300, 1987.
8. Sclavos S, Porter S, Seow WK: Future caries development in children with nursing bottle caries. *J Pedod* 13:1-10, 1988.
9. Wei SHY: Mechanical and chemical plaque control. In *Pediatric Dentistry: Total Patient Care*, Philadelphia: Lea & Febiger, 1988, pp 23-42.
10. McClure DB: A comparison of toothbrushing techniques for the preschool child. *ASDC J Dent Child* 33:205-10, 1966.
11. Bullen C, Rubenstein L, Saravia ME, Mourino AP: Improving children's oral hygiene through parental involvement. *ASDC J Dent Child* 55:125-28, 1988.
12. Konig KG: Feasibility of the combined use of fluoride. *J Dent Res* 69 (Spec Iss):801-4, 1990.
13. Levy SM, Maurice TJ, Jakobsen JR: Feeding patterns, water sources and fluoride exposures of infants and 1-year-olds. *J Am Dent Assoc* 124:65-69, 1993.
14. Burt BA: The increase in dental fluorosis in the United States: should we be concerned? From proceedings of the College of Diplomates of American Board of Pediatric Dentistry Annual Symposium, 1992. *Pediatr Dent* 16:146-51, 1993.
15. Feigel R, Kittle P, Killian C, Beckman T, Brandt S: Fluorosis workshop of the College of Diplomates of the American Board of Pediatric Dentistry. *Pediatr Dent* 16:152-53, 1993.
16. Stannard J, Rovero J, Tsamtsouris A, Gavris V: Fluoride content of some bottled waters and recommendations for fluoride supplementation. *J Pedod* 14:103-7, 1990.