



# Dental treatment under general anesthesia in an intellectually disabled child with intellectually disabled parents

Jeong-Hwa Han, Hong-Keun Hyun, Young-Jae Kim, Jung-Wook Kim, Ki-Taeg Jang, Chong-Chul Kim, Sang-Hoon Lee, and Teo Jeon Shin

Department of Pediatric Dentistry and Dental Research Institute, School of Dentistry, Seoul National University, Seoul, Korea

Children with an intellectual disability often demonstrate lack of cooperation during dental treatment and require behavioral management. A child with mild intellectual disability can be managed adequately using restraints and medication. However, in cases of profound intellectual disability, dental treatment under general anesthesia is usually required. In cases where the patient is an intellectually disabled child who has intellectually disabled parents, it is difficult to evaluate the patient's preoperative condition and to obtain consent for treatment under general anesthesia. Furthermore, they are unable to respond to emergencies after treatment. Therefore, dental treatment should be performed under general anesthesia with hospitalization for children with an intellectual disability. This case presents the dental treatment of an intellectually disabled child, who has intellectually disabled parents, and who required general anesthesia and hospitalization.

**Keywords:** Dental care for disabled; General anesthesia; Intellectual disability

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

As the cognitive functions of pediatric patients are not yet mature compared when with those of adults, pediatric patients openly express their fear and anxiety, and tend to display uncooperative patterns of behavior while receiving treatment [1]. Children with intellectual disabilities tend to perform negative behaviors during treatment especially often and, in most cases, general anesthesia is necessary in order to treat these patients [2].

When general anesthesia is performed on intellectually disabled children for the treatment of systemic diseases, the patient's condition should be accurately assessed prior to the treatment, and they should be closely monitored after the treatment in case recovery from anesthesia is slow. Therefore, for pediatric patients who are undergoing

dental procedures under general anesthesia, the cooperation of their parents is necessary since the success of the treatment depends on it.

If both the parents of an intellectually disabled child, who requires general anesthesia, are intellectually disabled, assessment of the pediatric patient's condition before treatment becomes difficult and problems are likely to arise during the process of obtaining a consent form for the treatment and anesthesia from the parents. Moreover, performing outpatient general anesthesia, which has been widely used in dental procedures, would be difficult because intellectually disabled parents have a difficulty to take care of patients.

When both the parents of a child have intellectual

Received: 2016. September. 10. • Revised: 2016. September. 19. • Accepted: 2016. September. 21.

Corresponding Author: Teo Jeon Shin, Department of Pediatric Dentistry, Seoul National University School of Dentistry, 28 Yeongeong-dong Jongno-gu, Seoul 110-768, Korea

Tel: +82-2-2072-2607 Fax: +82-2-744-3599 E-mail: [snmc94@snu.ac.kr](mailto:snmc94@snu.ac.kr)

Copyright© 2016 Journal of Dental Anesthesia and Pain Medicine

disabilities, their children are also likely to have intellectual and developmental disabilities [3]. Therefore, there can be situations in which both parents of an intellectually disabled pediatric patient, who may display uncooperative behaviors during treatment, are also intellectually disabled. This study reports the case of a dental treatment in an intellectually disabled pediatric patient under general anesthesia. This case report identifies the problems that occur when both parents, who are the legal guardians of a pediatric patient, are intellectually disabled and, further, investigates the factors to consider when preparing and performing general anesthesia.

## CASE REPORT

A pediatric patient, who had cerebral palsy, intellectual disability, central hypotonia, and seizure disorder, visited the pediatric dentistry department of Seoul National University Dental Hospital because of pain on his right cheek. Due to his lack of ability to communicate and cooperate with others, Pedi-Wrap and oral opening devices had to be used. Since both of his parents were intellectually disabled, the family was accompanied by a social worker. Treatment was performed step-by-step while the patient was under physical restraint. During a regular oral examination, a number of dental caries were identified on the maxillary and mandibular first molars, and accordingly, restorative treatment was scheduled. It



Fig. 1. Patient under general anesthesia.

was deemed that the caries would develop rapidly due to the patient's poor oral hygiene status, and that performing dental procedures on multiple teeth using local anesthesia would be difficult due to the patient's lack of ability to cooperate. As a result, general anesthesia was chosen for the purpose of behavior management. General anesthesia was performed after the social worker and parents, after being well informed about the method, process, and side effects of the dental procedure, signed a consent form. Preoperative blood examination results showed no risk factors related to performing general anesthesia on the patient. However, considering potential emergency situations that could be difficult to deal with, inpatient general anesthesia was performed.

Monitoring devices (electrocardiogram [ECG] monitor, pulse oximeter, sphygmomanometer, thermometer, and end-tidal CO<sub>2</sub> monitor) were attached to the patient, and anesthesia was induced through O<sub>2</sub> and sevoflurane inhalation. Vecuronium (3 mg) was administered as a muscle relaxant and an endotracheal tube with an internal diameter of 5.5 mm was inserted after the patient's muscles were sufficiently relaxed. Anesthesia was maintained with desflurane, O<sub>2</sub>, and N<sub>2</sub>O (Fig. 1). The treatment lasted for 150 minutes and the anesthetic procedure lasted for 180 minutes. No movement or spontaneous respiration by the patient was observed during the procedure. No additional muscle relaxants were administered. The patient showed no signs of complications after the treatment and was moved back to his ward, after which he was discharged from the hospital.



Fig. 2. Preoperative intraoral photo.

Later on, during a regular check-up, loss of a dental restoration placed in the mandibular first molar three years ago, and extensive crown fractures in the marginal areas were noticed (Fig. 2). Consequently, tooth extraction was scheduled. As it was still unlikely that the patient would cooperate during treatment, it was decided that the treatment would again be provided under general anesthesia. The procedure and need for general anesthesia were explained to his parents, as well as the necessary precautions, in a way that was easy for them to understand, and a consent form was obtained. At that time, the patient was taking the following antiepileptic medications: 330 mg oxcarbazepine, 720 mg valproic acid, and 750 mg levetiracetam.

A preoperative blood examination was performed and consultation was requested of the Pediatrics Department of Seoul National University Hospital and the test results showed no risk factors associated with performing general anesthesia on the patient. However, considering potential emergency situations, inpatient general anesthesia was performed. Monitoring devices (ECG monitor, pulse oximeter, sphygmomanometer, thermometer, and end-tidal carbon dioxide monitor) were attached to the patient, and anesthesia was induced through O<sub>2</sub> and sevoflurane inhalation. Rocuronium (30 mg) was administered as a muscle relaxant, and an endotracheal tube with an internal diameter of 5.5 mm was inserted after the patient's muscles were sufficiently relaxed. Anesthesia was maintained with desflurane, O<sub>2</sub>, and N<sub>2</sub>O. The treatment lasted for 95 minutes and the anesthetic procedure took 125 minutes. No movement or spontaneous respiration by the patient was observed during the procedure. The patient showed no signs of complications after the treatment; he was discharged from the hospital one hour after he was moved back to his ward.

## DISCUSSION

It is known that children of intellectually disabled parents have a high likelihood of having developmental,

socio-psychological problems, and behavioral problems [3]. In addition, improper breastfeeding, diet control, and oral care in a child due to their parents' potential ignorance may increase the child's chance of developing dental disease [4]. For intellectually disabled children, voluntary oral care is hard to achieve and if a child's ability to perform oral care is underdeveloped due to their parents' low intellectual abilities, the child is more likely to receive dental treatment in the future as a result. According to previous research, intellectually disabled patients are very likely to have poor oral hygiene status and to be affected by periodontal diseases [5,6]. Based on all these results, it can be said that intellectually disabled pediatric patients whose parents are also mentally challenged are very likely to develop dental disease and receive dental treatment in the future.

Therefore, while it is important to treat dental problems in intellectually disabled pediatric patients whose parents are also intellectually disabled, it is just as important to teach parents about oral care for children in a way that is easy for them to understand. Through communication with not only patients, but also their parents, an environment in which patients can receive positive oral care over a long-term period should be created. Increasing numbers of dental procedures that involve anesthesia as a means to manage patient behavior are being performed today, and common anesthetics are used in outpatient clinics during general anesthesia due to their rapid onset of action and good reversibility upon ceasing the administration [7]. In the hospital this study focused on, it was also common for general anesthesia to be performed on intellectually disabled patients, who are unlikely to cooperate during dental procedures in an outpatient operation room.

However, in cases of outpatient general anesthesia, it is difficult to check a patient's comorbidities unlike in inpatient general anesthesia, and the cooperation of the patient's is necessary for the proper preparation of general anesthesia and detection, as well as management, of complications that may occur after the patient is discharged. As could be seen in this case report, performing

outpatient general anesthesia on a intellectually disabled patient whose parents are also intellectually disabled can be a challenge due to difficulties in performing preoperative care and the parents' lack of ability to cope with emergency situations. For this reason, inpatient general anesthesia was chosen for the patient in this study. For intellectually disabled patients undergoing dental procedures, it possible variations in the method of general anesthesia should be considered depending on their parents' level of cognitive skills. It is important to talk to patients and their guardians about the treatment and anesthetic procedures, as well as their side effects and risk/benefits to help them reach their own decision.

Informed consent is an important factor of a patient's autonomous decision-making, and it prevents medicolegal issues related to various complications [8]. Most children have immature cognitive abilities, and cannot make legal decisions on their own; therefore, informed consent must be given by their legal representatives [9]. However, in cases where it is difficult for the legal representatives to provide informed consent—as in the case of this study—legal problems may arise later on. It is possible to receive consent from mildly intellectually disabled individuals after thoroughly explaining the surgical and anesthetic procedures. However, it could be almost impossible to receive informed consent from individuals with moderate intellectual disability. Therefore, in order to obtain a consent form for surgery and anesthesia for intellectually disabled patients, whose parents also have a moderate degree of mental disability, another legal representative is needed who can provide informed consent in place of the parents. To prevent any legal issues from arising later on, several factors should be considered, such as determining the person to give informed consent and the level at which the surgical and anesthetic procedures should be explained to intellectually disabled patients.

When performing dental treatments and general anesthesia in uncooperative, intellectually disabled children, whose parents are both intellectually disabled, for the purpose of behavioral management, there are more things to consider during the pre- and postoperative stages than

if the parents had normal cognitive abilities. Furthermore, the methods of anesthesia are also likely to change for these patients. Types of treatment, the patient's ability to cooperate during treatment, and the level of parents' cognitive functions should all be considered before performing a treatment in order to achieve safe and effective anesthesia, and prevent any legal issues from arising in the future.

## REFERENCES

1. Liddell A, Rabinowitz FM, Peterson C. Relationship Between Age Changes in Children's Dental Anxiety and Perception of Dental Experiences. *Cognit Ther Res* 1997; 21: 619-31.
2. Wang YC, Lin IH, Huang CH, Fan SZ. Dental anesthesia for patients with special needs. *Acta Anaesthesiol Taiwan* 2012; 50: 122-5.
3. Feldman MA, Walton-Allen N. Effects of maternal mental retardation and poverty on intellectual, academic, and behavioral status of school-age children. *Am J Ment Retard* 1997; 101: 352-64.
4. Feldman MA, Case L. Teaching child-care and safety skills to parents with intellectual disabilities through self-learning. *J Intellect Dev Disabil* 1999; 24: 27-44.
5. Brown JP, Schodel DR. A review of controlled surveys of dental disease in handicapped persons. *ASDC J Dent Child* 1976; 43: 313-20.
6. Tesini DA. Age, degree of mental retardation, institutionalization, and socioeconomic status as determinants in the oral hygiene status of mentally retarded individuals. *Community Dent Oral Epidemiol* 1980; 8: 355-9.
7. Dougherty N. The dental patient with special needs: a review of indications for treatment under general anesthesia. *Spec Care Dentist* 2009; 29: 17-20.
8. Wisiak UV, Kröll W, List W. Communication during the pre-operative visit. *Eur J Anaesthesiol* 1991; 8: 65-8.
9. Campbell AGM. Infants, Children, and Informed Consent. *BMJ* 1974; 3: 334-8.