



Behavioral regression in 2 patients with autism spectrum disorder and attention-deficit/hyperactivity disorder after oral surgery performed with a general anesthetic

Seth Matton, DMD, MD; Gerardo P. Romeo, DDS, MD

The prevalence of autism spectrum disorder (ASD) has increased steadily over the past 2 decades, with National Health Statistics Reports estimating the prevalence at 1 in 45.¹ The unique health care needs of children and adolescents with ASD led to 4.1 to 6.1 times increases in medical expenditures per year compared with those for children and adolescents without ASD.² Given the variations in the symptom severity of those affected by these disorders, routine care for people with ASD can be variably complex and depends on numerous factors. Level of patient functionality, availability of an adequate support system, access to appropriate care professionals, and the availability of monetary resources and insurance coverage all have a major influence on the oral health of these patients.³ In terms of dental needs, many of these patients cannot comply with routine outpatient care and often require the use of sedation or a general anesthetic to provide a safe and controlled environment for comprehensive care. The use of general anesthetic for dental care in many patients with ASD is a matter of necessity.⁴ The use of general anesthetic for comprehensive dental care in general, as well as in patients with ASD and other neurodevelopmental disorders, has a long track record of success and safety, with many reported benefits to practitioner, patient, and family.⁵⁻⁹

The perioperative care of patients with ASD has been discussed in the literature.¹⁰⁻¹² Unique postoperative difficulties in this population, and in other patients

ABSTRACT

Background and Overview. Routine dental care for people with autism spectrum disorders can be complex. There is little published on postoperative behavioral changes associated with use of general anesthetics in this population.

Case Description. The authors describe postoperative behavioral changes in 2 patients with autism spectrum disorder and attention deficit hyperactivity disorder that the patients' caretakers described as regression. In both cases, behaviors representative of autism spectrum disorder and attention deficit hyperactivity disorder worsened after uncomplicated oral surgery after receipt of a general anesthetic in the operating room. In both cases, behavioral changes caused great difficulties for the patients and caretakers and were difficult to address.

Conclusions and Practical Implications. With little in the scientific literature, these 2 cases have a great importance for the dental care practitioner. Awareness must be raised so that further investigation can occur regarding this phenomenon.

Key Words. Autism; attention deficit; behavioral change; general anesthesia; dentistry; oral surgery. JADA 2017;148(7):519-524

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affected by other neurodevelopmental disorders, tend to be minor, with most described complications limited to disruptive postanesthetic behaviors while in the hospital. Otherwise, the postoperative complications reported tend to mirror those encountered during treatment of any other dental patients receiving general

anesthetic, such as postoperative nausea and vomiting, bleeding, rash, and allergy.^{13,14} However, to our knowledge, there is little if any work published on prolonged, negative postoperative behavioral change in the ASD population. In a retrospective review, Rada¹³ described the opposite, having observed resolution of self-injurious and aggressive behavior after dental treatment in a population of patients with ASD treated after having received a general anesthetic.

In contrast, Internet blogs, websites, and social networks have extensive discussions regarding negative postanesthetic behavioral changes in this population. The Internet is rife with discussions written mostly by health care workers, caretakers, and parents discussing individual experiences and the difficulties that accompany them. To our knowledge, a formal scientific investigation on this topic has yet to be published.

In this case report, we present 2 cases of patients treated at the Division of Oral and Maxillofacial Surgery at Northwell Health, Long Island Jewish Medical Center, New Hyde Park, NY, who required use of general anesthetic for completion of oral surgical procedures in the operating room. We treated both patients without apparent surgical complication. However, during routine follow-up visits, the parents of both patients independently reported frank and distressing behavioral changes. In addition to ASD, both of these patients had a comorbid diagnosis of attention-deficit/hyperactivity disorder (ADHD) being managed with stimulant medications. Both families described regression of behavior, which after further questioning indicated they meant regression of ASD-type behaviors to a level that had not been present for a substantial length of time. In both cases, there was no surgical explanation for the behavioral changes. Given the similar symptoms in separate people, we conducted a literature search to gain further insight into this phenomenon.

In this case report, we highlight these 2 cases in an attempt to bring to the consciousness of the dental and medical communities the potential for such postsurgical and postanesthetic difficulties in patients with ASD and ADHD being treated with stimulant medications. Both cases resulted in clinically significant and long-lasting disturbances for the patients and for the parents and caretakers.

CASE 1

We received a referral of an 18-year-old man with a medical history of fragile X syndrome, ASD, ADHD, and scoliosis who required extraction of impacted third molars. The patient was taking only methylphenidate at that time. At baseline, he was socially withdrawn but receptive to interactions with his mother and directions from her. He spoke on a limited basis in 1- to 2-word utterances. He allowed a limited oral examination in the outpatient setting and held still so we could obtain a

panoramic radiograph. The patient's mother reported that she helped him with all activities of daily living, including oral care, which was overall limited. He had had only 1 previous experience with anesthesia when he underwent adenoidectomy and had myringotomy tubes placed as a child, without any reported postoperative complications.

We extracted the impacted third molars in the operating room after the patient had received a general anesthetic without complications. He was cooperative enough to have intravenous access established with the help of his mother before induction. We transferred him to the operating room, and his induction was uneventful. Medications administered included 2 milligrams of midazolam, 100 micrograms of fentanyl, a 200-mg bolus of propofol, and 50 mg of rocuronium to facilitate intubation. Endotracheal intubation via a nasal route was uncomplicated. Maintenance anesthetic consisted of an additional 100 µg of fentanyl and sevoflurane. Additional medications included 2 million units of intravenous penicillin, 8.5 milliliters of 2% lidocaine with 1:100,000 units of epinephrine for local anesthetic in the operative field, and intravenous acetaminophen. At the time of recovery, the patient received 0.6 mg of glycopyrrolate and 3 mg of neostigmine to ensure full reversal of his neuromuscular blocking agent and 62.83 µg of dexmedetomidine before undergoing an uneventful extubation. We then transferred him to the recovery area, where he had an uneventful postoperative course and was discharged to the care of his mother with prescriptions for ibuprofen and for acetaminophen and hydrocodone.

At routine follow-up 1 week later, the patient showed appropriate healing and no signs of postoperative infection on examination. However, 5 weeks later, the patient's mother scheduled a second follow-up appointment because of concerning behavioral changes in her child. When we saw him, he had a limited oral evaluation, the results of which showed complete healing and no signs of infection. Reported behavioral changes, however, included a complete loss of appetite and ongoing insomnia. The patient's mother also reported that he was less engaged socially and less interactive with her at home. Although his verbal interaction was never more than a few words, she reported that he was less responsive to her and less willing to give or receive hugs or contact with her. Also different from his baseline, he had difficulties in falling asleep, and he had frequent episodes of waking during the night and trying to leave his home stating repetitively that he wished to "see the doctor." The insomnia became so severe that the patient's mother also could not sleep at nights because he would enter her room and tell her to wake up. The

ABBREVIATION KEY. ADAH: Attention-deficit/hyperactivity disorder. ASD: Autism spectrum disorder.

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