



## CLINICAL CASE ROUNDS

# Assessment of Aggressive Behaviour in a Patient with Autism Spectrum Disorder Requiring General Anesthesia

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## Abstract

**Objective:** To consider the utility of general anesthesia in the assessment of aggressive behaviour associated with autism spectrum disorder (ASD). **Methods:** We describe the case of an adolescent male exhibiting violent behaviour with a previous diagnosis of ASD and review medical literature relevant to the assessment of aggression in the context of ASD. **Results:** A 16-year-old male with a prior diagnosis of ASD, who was non-verbal, was admitted to an inpatient psychiatry ward with the presenting issue of violent behaviour. The patient had not received routine medical or dental care for several years due to agitation and aggression when attempts to physically examine him were made. General anesthesia was necessary to assess for medical conditions that may be contributory to his behavioural changes. While under general anesthesia, he was physically examined by several consulting services, received brain imaging, and laboratory specimens were drawn. **Conclusions:** Aggressive behaviour is a common issue for patients with ASD. When a patient's behaviour precludes examination and investigations, general anesthesia may be beneficial to facilitate the assessment process. This case illustrates the importance of a multidisciplinary approach in the assessment and management of a minimally verbal patient presenting with behavioural changes. To the knowledge of the authors, this represents the first published case report of a patient with ASD requiring general anesthesia for the assessment of aggressive behaviour.

**Key Words:** autism spectrum disorder, aggression, general anesthesia

## Résumé

**Objectif:** Estimer l'utilité d'une anesthésie générale dans l'évaluation du comportement agressif associé au trouble du spectre de l'autisme (TSA). **Méthodes:** Nous décrivons le cas d'un adolescent masculin présentant un comportement violent avec un diagnostic précédent de TSA, et révisons la littérature médicale traitant de l'évaluation de l'agressivité dans le contexte du TSA. **Résultats:** Un jeune homme de 16 ans ayant un diagnostic précédent de TSA, qui était non verbal, a été hospitalisé dans une unité d'hospitalisation psychiatrique alors qu'il présentait un problème de comportement violent. Le patient n'avait pas reçu de soins médicaux ou dentaires réguliers depuis plusieurs années en raison de l'agitation et de l'agressivité qu'il manifestait quand on tentait de l'examiner physiquement. L'anesthésie générale était nécessaire pour évaluer les affections médicales qui pouvaient contribuer à ces changements de comportement. Quand il fut sous anesthésie générale, il a été physiquement examiné par plusieurs services de consultation, il a reçu une imagerie cérébrale et des échantillons de laboratoire ont été prélevés. **Conclusions:** Le comportement agressif est un problème commun chez les patients souffrant du TSA. Quand le comportement d'un patient empêche l'examen et les investigations,

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l'anesthésie générale peut être bénéfique pour faciliter le processus d'évaluation. Ce cas illustre l'importance d'une approche multidisciplinaire dans l'évaluation et la prise en charge d'un patient minimalement verbal qui présente des changements de comportement. À la connaissance des auteurs, ceci représente la première étude de cas publiée d'un patient souffrant du TSA nécessitant une anesthésie générale pour évaluer un comportement agressif.

**Mots clés:** trouble du spectre de l'autisme, agressivité, anesthésie générale

## Introduction

Symptoms of aggression are common in patients with autism spectrum disorder (ASD). Aggression includes behaviour that is threatening or likely to cause harm, and may include verbal or physical behaviours (Fitzpatrick et al., 2016). While figures vary in the literature, Kanne and Mazurek (2011) reported that in their sample of 1,380 youth diagnosed with ASD, 68% and 49% had demonstrated aggression at some point towards a caregiver and non-caregiver, respectively.

Determining an etiology for aggressive behaviour in patients with ASD can be a complex process and it may be difficult to distinguish features of ASD from other medical or psychiatric symptoms (McGonigle et al., 2014). While a variety of pharmacological agents have empirically demonstrated efficacy in the management of aggression associated with ASD, other medical and psychiatric issues should ideally be addressed prior to their use (Fung et al., 2016). Medical factors may cause or exacerbate aggressive behaviours, and treating such contributors may ameliorate the need for pharmacologic intervention (Myers et al., 2007).

Here we report on a case necessitating the involvement of several pediatric medicine specialists and the use of general anesthesia in assessing an adolescent previously diagnosed with ASD who presented with an increase in aggressive behaviour.

## Case Description

A 16-year-old male with a history of ASD (requiring very substantial support) who was non-verbal presented to the emergency department of a tertiary care hospital by ambulance, accompanied by his biological parents with whom he lived. Police had been called to the house of the patient and his parents due to an increase in aggressive behaviour over the previous year, with marked changes in the preceding three weeks. His behaviour had become increasingly difficult to manage at home and at school, which he attended with a modified educational program. An ambulance was called to assist with transportation to the hospital, and the patient was administered several intramuscular doses of midazolam and haloperidol in attempts to achieve sedation.

At the time of initial presentation, the patient had been taking the following daily medications: chlorpromazine 100 mg in the morning, 200 mg at noon, and 200 mg at 15:00; lorazepam 2 mg in the morning, 3 mg at noon, 3 mg at 15:00, and 4 mg at bedtime; and sertraline 50 mg in the morning. Until one month prior to this presentation, he had been taking fluvoxamine 150 mg daily along with above medications with the exception of sertraline. However, fluvoxamine was discontinued due to a shortage from the manufacturer and at this point, sertraline was initiated by his community pediatrician in replacement of fluvoxamine.

The patient was not known to have any chronic medical issues. However, his most recent appointment with his pediatrician occurred eight months prior to this presentation. During this appointment, the pediatrician was struck and kicked by the patient. A physical examination was not possible at that time.

Once in the emergency department, psychiatric consultation was sought. While obtaining a more detailed history from the patient's parents, they reported that the patient's usual respite worker had been on vacation for the past few weeks. They denied any other psychosocial stressors that could be contributory to the patient's behavioural changes. History of response to medication was reviewed, and his parents endorsed that the dose of lorazepam had been gradually increased over the preceding year with no appreciable improvement in the patient's condition. No other medication changes had been made until, as previously described, fluvoxamine was discontinued and sertraline was initiated one month prior to this presentation. Furthermore, family psychiatric history was non-contributory.

It was felt that psychiatric admission was warranted and his parents, serving as substitute decision makers, were in agreement with his admission to an inpatient psychiatric unit as an involuntary patient. Most of the patient's time in the early stages of admission was spent under constant observation. Observation and assessment by the inpatient psychiatric team did not reveal the presence of comorbid psychiatric conditions, including psychotic, depressive, or manic symptoms.

A pediatric medicine consultation was obtained to assist in ruling-out medical conditions that may be contributing to

the patient's behaviour. Physical exam was not possible due to the patient's ongoing aggressive behaviour. The patient was noted to have regular bowel movements with formed stools, suggesting that he was not constipated. The patient did not appear to be in any obvious pain or discomfort, and administration of acetaminophen did not result in any appreciable change in disruptive behavior. The consulting pediatrician recommended a complete physical examination under general anesthesia, along with blood and urine laboratory investigations, and a brain MRI. These recommendations were discussed with the patient's parents, who provided consent, and anesthesia consultation was sought. Several other pediatric subspecialty services were consulted to assist in his examination, including otolaryngology, ophthalmology, medical genetics, and dentistry.

The patient was administered oral ketamine and midazolam, mixed in juice, to induce anesthesia. He was then administered intramuscular ketamine.

A brain MRI was conducted and revealed a developmental venous anomaly within the parasagittal right occipital lobe region, which was not felt to be clinically relevant.

Physical examination was remarkable for acanthosis nigricans in the patient's axillae and popliteal fossae. No dysmorphic features were evident. Examination of his ears did not reveal signs of infection. Ophthalmologic examination was normal. Dental examination did not reveal any abnormalities, and dental cleaning was carried out while under anesthesia. Routine bloodwork was unremarkable aside from a slightly elevated serum prolactin level (62 ng/mL), which was attributed to antipsychotic use.

The medical genetics service recommended an array of blood, urine, and genetic tests to rule-out metabolic and genetic abnormalities. The specimens obtained and sent for analysis included urinary and plasma amino acids, urinary organic acids, urine porphyrins, Batten disease screen, urine sialic acid, transferrin isoelectric focusing (TIEF), as well as genetic microarray and cytogenetic testing for Fragile X syndrome. At the time of writing this manuscript, no abnormal results had been obtained.

Medication changes that occurred during hospitalization included discontinuation of chlorpromazine, and initiation of risperidone, which was titrated to a dose of 1 mg twice per day in liquid form. Quetiapine was also administered at nighttime for sedation, and a final dose of 200 mg at bedtime was reached. Melatonin 10 mg at bedtime was also given to assist with sleep. Lorazepam was discontinued in favour of clonazepam 1 mg in the morning and 2 mg at bedtime. Sertraline was increased to 100 mg daily. Modest improvement in the degree of the patient's agitated behaviour was observed, and he was discharged home with his parents.

The patient was discharged to the care of his pediatrician and to a community psychiatrist, who would assume responsibility for future medication management. This psychiatrist worked in a specialized multidisciplinary clinic for patients with neurodevelopmental disorders. Through remote contact with this clinic, the patient's parents had previously accessed occupational therapy services to discuss behavioral and environmental strategies to modify problematic behaviours. The parents were aware that these services could again be accessed so as to maintain a multifaceted approach to managing the patient's behaviour.

## Discussion

Numerous medical and psychiatric issues may contribute to aggressive behaviour in patients with ASD. Among the factors that should be considered are pain and discomfort, which may be caused by problems including, but not limited to, dental abscess, constipation, fracture, headache, otitis media or externa, and urinary tract infection (Myers et al., 2007). Insomnia or changes in sleep pattern may contribute to the onset of aggressive behaviour (McGonigle et al., 2014). Given the increased prevalence of seizure disorders in patients with ASD compared to the general population, seizure activity should be ruled out as a cause of behavioural changes (McGonigle et al., 2014). Some individuals with ASD strongly prefer routine and predictability, raising the possibility that the recent unavailability of the patient's respite worker may have contributed to his increase in aggressive behaviour.

In the case described, the nature of the patient's behaviour interfered with efforts towards physical examination, laboratory investigations, and diagnostic imaging. The need for examination and investigations was felt to be especially important, given the myriad of possibilities for the patient's aggression and the fact that he had not received a physical examination or bloodwork for several years. The consulting medical services felt that an extensive workup was justified since such an opportunity to obtain specimens may not exist in the future, or would again require the patient to undergo general anesthesia. Patients with ASD may be more difficult to sedate and may be at higher risk of adverse effects during certain anesthetic procedures (Brown et al., 2018). As such, tests for diseases that were considered possible but unlikely (e.g., the Batten disease screen) were carried out after balancing the risks and benefits of repeated future general anesthesia, and arriving at the consensus that it would be in the patient's best interests to carry out extensive testing during a single episode of general anesthesia.

Children with ASD may have difficulty cooperating with invasive investigations, such as phlebotomy, and may require anesthesia for procedures that are generally tolerated by typically-developing children without anesthesia, such as

dental examination and MRI scans (Berglund et al., 2017; Short & Calder, 2013). To the knowledge of the authors, however, there is no existing literature that has reported on the use of general anesthesia for the purpose of investigating the cause of aggression associated with ASD.

## Conclusions

Aggressive behaviour is a common issue for patients diagnosed with ASD. A variety of medical and other psychiatric conditions may underlie aggressive behaviour, and an assessment for their presence should occur when attempting to determine an etiology for such behaviour. This may involve physical examination, diagnostic imaging, and laboratory investigations. As in the presented case, involvement from multiple medical specialties may be required to provide a sufficient assessment, highlighting the importance of interdisciplinary collaboration. When a patient's behaviour precludes examination and investigations, general anesthesia may be considered to facilitate the assessment process.

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The authors have no financial relationships to disclose.

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