Anesthetic Challenges and Solutions in Managing a Nonverbal Autistic Adult

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Introduction

Hospitals are often overwhelming, but for individuals with autism spectrum disorder (ASD), the challenges are even greater due to unpredictable environments, sensory overload, and disruptions to their daily routines.[2] About one percent of the population is autistic.[5] In medicine, autism is often thought of as a childhood condition, but autistic patients range from pediatrics to geriatrics.[5] The needs and behavioral differences of autistic patients are common, but their responses to stressful situations vary.[2] Although a vast amount of information regarding autism is available in medical journals, there is very little information concerning the care of autistic patients in the perioperative period.[7] Every anesthetist will care for an autistic patient at some point in their career. Anesthetists will likely face challenges in delivering safe and effective care while addressing their patients' specific needs.

"A difficult induction may be a traumatic memory for a non-autistic person, but it may prevent an autistic person seeking care for future life-threatening conditions."[2]

This presentation aims to describe the course of a patient with ASD during the perioperative period and to highlight recent literature and current best practices regarding the anesthetic management of ASD. Healthcare providers have a legal duty to make appropriate accommodations to address ASD patient's specific needs, as they are protected by law under the Equality Act (2010) and the Autism Act (2009).[2] These unique considerations and tailored strategies can improve the safety, comfort, and perioperative experience of patients with ASD.

Learning Objectives

1. Gain an understanding of how to manage patients with autism during the perioperative period.
2. Discuss complications of traumatic medical experiences and predict future barriers to healthcare.
3. Analyze the relevance of using the autistic SPACE framework to meet the needs of autistic patients.

Patient Description

A 36-year-old male, ASA 2, presents for the management of severe dental caries requiring tooth extractions. He is 5'10" tall, weighs 136 kilograms, and has no known drug allergies. His past medical history includes autism (non-verbal), sleep apnea, and dental caries with fractured teeth. He arrives at the pre-op area accompanied by his mother, who is his primary caregiver, and his older brother.

The family reports that the patient has no prior surgical history and a significant needle phobia, leading to his refusal of IV placement. The attending physician rules out oral midazolam, explaining the dose would be insufficient for the patient's size. Additionally, she emphasizes the 30-minute onset time would cause delays in the OR schedule. The family suggests nasal spray as a potential route for premedication, noting that he frequently uses it at home. After learning the pharmacy does not stock atomizers, the attending physician recommends using a standard syringe to administer 200 mcg of fentanyl intranasally. The family attempts this but is unsuccessful. The family leaves the pre-op area for the waiting room.

With his family gone, the patient elopes twice from pre-op, wandering the halls. His mother stresses the importance of completing the procedure that day and consents to his brother accompanying him to the OR since she does not want to go herself. The brother is given a white bunny suit and accompanies the patient and team to the OR.

Surgical Timeline

08:42 – The patient arrives in the OR, accompanied by his brother. The staff placed a sign on the door to minimize unnecessary entry and decrease the risk of overwhelming the patient.

08:44 – The patient appears calm but remains uncooperative with staff. He sits in a chair while the staff sit on the floor to build trust and establish rapport, avoiding overcrowding his personal space. The goal is to encourage the patient to join the staff on the floor.

08:51 – The team attempts to administer IM ketamine twice, but both attempts are unsuccessful. The patient refuses to remain still and closely observes each of the staff while he stims. The brother devises a plan to assist.

08:56 – The brother physically restrains the patient on the ground while the attending physician administers 500 mg of IM ketamine. Despite the 500 mg of ketamine, the patient continues to resist and shows no signs of sedation. The team calls for additional support to the room.

08:58 – A second attending physician and additional anesthetists arrive. Along with the brother, they help to physically restrain the patient to ensure safety and prevent injury as the patient remains combative. The team works collaboratively to maintain the patient's safety while developing the next steps.

09:02 – The attending physician successfully performs an inhalational induction on the floor. The team instructs the brother to turn his head away to avoid inhaling the sevoflurane and nitrous oxide.

09:04 – The team places a peripheral IV and ASA monitors with the patient sedated. They develop a strategy to transfer the 136-kilogram patient from the floor to the operating table. The brother is then escorted back to the waiting room.

09:06 – Eight staff members safely transferred the patient to the operating table using a hover mat and secured him in place.

09:11 – Induction and intubation are successfully completed using a glidescope and a 7.5 mm endotracheal tube.

Maintenance – Maintenance is uneventful, and the procedure is completed without complications.

Emergence – The team transfers the patient to a stretcher and extubates him in a deep plane of anesthesia. He is transported to the PACU in stable condition, where he wakes up and is reunited with his mother. The procedure lasts approximately 20 minutes.

Case Significance

To create a positive perioperative experience for a patient with ASD, it is important to individualize care through a patient-centered approach.[3] Open discussions with family members or caregivers are crucial to identify triggers, sensory preferences, and coping mechanisms.[2] This collaboration can help create a tailored strategy to reduce stress-inducing situations and build trust.[2]

Premedication plays a vital role in minimizing distress and creating a smoother perioperative process.[4] ASD patients may have many sensory aversions and preferences, such as favoring liquid medications over nasal sprays and vice versa.[2] Premedication should be offered via their most favored route.[2] When conventional routes are not possible due to patient refusal or increased anxiety, intramuscular (IM) sedation with medications such as ketamine can serve as an effective alternative.[7] IM sedation minimizes the need for physical restraint and helps to avoid overall agitation.[4]

A well-coordinated plan that includes family involvement, sensory accommodations, and a clear perioperative plan can significantly enhance the safety and comfort of the perioperative experience for ASD patients.[2] Additional strategies can be implemented, like decreasing environmental stimuli and applying evidence-based frameworks, such as SPACE, gives added support for the patient's needs.[3] These considerations not only reduce anxiety and procedural delays but also create a safer, more positive surgical experience for those with ASD.[5]

Analysis of Event

The oversights in this case highlight the need for comprehensive preparation to address both physical and procedural needs in complex cases. The team faced several challenges from inadequate planning, including managing sedation, accounting for the patient's body habitus, and creating a strategy to safely transfer the patient from the floor to the operating table.

Due to the patient's weight of 136 kg, the standard 1-inch needle used for intramuscular injections may have been insufficient for effective medication delivery. A 1.5-inch needle would have been more appropriate to ensure proper intramuscular administration. This highlights the importance of having a well-thought-out plan and tailoring it to meet each patient's individualized needs.

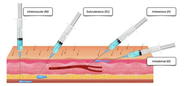

Figure 1. Types of injections and sites.[1]

During the case, the patient was administered 200 mcg of intranasal fentanyl; however, current literature does not support its use as an intranasal premedication. This emphasizes a need for evidence-based care in the perioperative setting. An alternative intranasal premedication, in this case, could have been dexmedetomidine at a dose of 2 mcg/kg, administered using an atomizer.[8] Atomizers deliver medication in a fine mist, allowing for adequate distribution and absorption through the nasal mucosa.[8]

Figure 2. Intranasal Mucosal Atomization Device (MAD).[6]

Insufficient planning led to a near-miss involving the patient's brother, emphasizing the importance of proactive strategies to prevent avoidable harm. The brother was unnecessarily exposed to anesthetic gases during the inhalational induction while physically restraining the patient on the ground. A perioperative care plan should have been established during the preoperative clinic visit, including a plan for oral sedation before arrival on the day of surgery. This would have reduced the need for physical restraint and minimized the brother's secondary exposure risk.

Sedating the patient on the floor introduced significant risks to both the patient and the surgical team. The lack of a clear plan for safely transferring the patient after sedation forced the team to improvise during a critical moment. Improvision increases the likelihood of injury and complications that can be avoided with step-by-step protocols ensuring patient safety. Given his history of obstructive sleep apnea, sedating him on the floor away from critical monitors and equipment significantly increased the likelihood of preventable harm. The importance of a controlled environment for high-risk patients was underscored during this time.

Overall, achieving sedation and general anesthesia was significantly delayed due to many challenges, including ineffective IM medication delivery, insufficient premedication, and the need to improvise while sedating the patient on the floor. These delays disrupted the operating room schedule's overall efficiency, particularly for what should have been a brief 20-minute procedure.

Aspect	What went right	What went wrong
Family Communication	• Involved family in decision-making & recovery	• Lacked pre-anesthesia planning to prevent trauma
Patient Environment	• Minimized excessive people in the OR	• Allowed patient to elope before sedation • Physical restraint • Inadequate accommodations for sensory needs
Medication Strategy	• Attempted other routes of premedication before IM ketamine	• Insufficient premedication • Use of intranasal fentanyl that is not currently recommended • Unsafe sedation conditions (floor, OSA, no monitors) • Possible inadequate needle length • Near-miss from unnecessary exposure of anesthetics in the brother
Teamwork	• Collaborated to transfer patient safely to the OR table	• Ripple OR delays due to poor preparation

Discussion

Caring for an autistic adult presents itself with challenges for anesthesia providers, emphasizing the need for patient-centered, evidence-based approaches. These challenges demonstrate the importance of implementing the SPACE framework (Sensory needs, Predictability, Accessibility, Communication, and Empathy) to minimize risks and prevent avoidable complications.[2]

Figure 3. Autistic SPACE framework[2]

Applying the SPACE framework:

1. *Sensory* – The team failed to address the patient's sensory sensitivities. The hospital's bright lights, noise, and chaos likely overwhelmed him.[2] To reduce sensory overload, the team should use dim lights, decrease the noise on alarms and monitors, and limit unnecessary staff during induction.[2]
2. *Predictability* – The team did not establish a clear plan, creating an unpredictable, stressful environment. Explaining the procedure to the family in advance, using visual aids and videos, and involving the family in pre-op discussions could have reassured the patient and prevented anxiety.[2]
3. *Accessibility* – The team allowed the brother to assist but did not plan how to involve him safely. They also lacked essential tools like atomizers and longer IM needles. Preparing all necessary equipment beforehand and ensuring safe family involvement would have improved accessibility and patient comfort.[2]
4. *Communication* – There was no effective communication between the team and the family. The team should engage the family to identify the patient's needs, use simple language or visual cues, and align all staff on the care plan to avoid confusion.[2]
5. *Empathy* – The lack of a patient-centered approach caused unnecessary distress and risk to the patient. The team should focus on creating a calming environment and validating the patient's emotions to build trust and reduce stress.[2]

Key lessons learned

- *Plan proactively* in the preoperative phases to avoid unnecessary complications.[3] Administering oral anxiolytics at home, such as Ativan, and pre-ordering tools like atomizers would have helped reduce stress and ensure readiness.
- *Adopt Evidence-Based Practices* such as using a 1.5-inch needle for IM injections for obese patients and additionally delivering the correct medication intranasally, such as dexmedetomidine 2 mcg/kg, with an atomizer for adequate absorption.[8] Adopting these practices as protocols will avoid deviations from the standard of care.
- *Minimize risks* by having a plan in place for a patient with sleep apnea to be induced with monitors applied and not on the floor. Preparing safe transfer methods is crucial for minimizing risks.[3]
- *Using the SPACE framework* by emphasizing sensory needs, predictability, accessibility, communication, and empathy, the team can better manage patients with autism and developmental delays.[3] This approach improves safety and reduces stress for the patient and family.[3]

Conclusion

This case illustrates how critical preoperative planning, evidence-based practices, and application of the SAPCE framework can benefit patients with ASD.[2] Healthcare professionals can improve patient safety, OR efficiency, and overall quality of care by focusing on the patient's unique needs and addressing challenges proactively.[2] Integrating these lessons into daily practice allows for a safer and more compassionate perioperative experience for patients with ASD and other developmental delays.[2]

Numbered References

1. Agnes Healthcare. (2022, April 18). *Types of injections and sites*. LinkedIn. https://www.linkedin.com/pulse/types-injections-sites-agnes-healthcare
2. Brown, S., Rabenstein, K., & Doherty, M. (2024). Autism and anaesthesia: A simple framework for everyday practice. *BJA Education*, *24*(4), 129-137. https://doi.org/10.1016/j.bjae.2024.01.002
3. Doherty, M., McCowan, S., & Shaw, S. C. (2023). Autistic SPACE: A novel framework for meeting the needs of autistic people in healthcare settings. *British Journal of Hospital Medicine*, *84*(4), 1-9. https://doi.org/10.12968/hmed.2023.0006
4. Guthrie, D. B., Boorin, M. R., Sisti, A. R., Epstein, R. H., Romeiser, J. L., Lam, D. K., Gan, T. J., & Bennett-Guerrero, E. (2021). Retrospective comparison of intramuscular admixtures of ketamine and dexmedetomidine versus ketamine and midazolam for preoperative sedation. *Anesthesia Progress*, *68*(1), 3-9. https://doi.org/10.2344/anpr-67-04-02
5. Lai, M., Baron-Cohen, S., & Lombardo, M. (2014). Autism. *The Lancet*, *383*(9920), 896-910. https://doi.org/10.1016/S0140-6736(13)61539-1
6. *LMA® mad nasal™ / Intranasal mucosal atomization device | Medisecur*. (n.d.). MediSecur. https://medisecur.com/en/intranasal-mucosal-atomization-device-25-bte#
7. Selvey, P., Stypulkowski, K., & Waisbren, S. (2019). Surgical management of the patient living with autism. *Surgery Open Science*, *1*(2), 90-96. https://doi.org/10.1016/j.sopen.2019.06.006
8. Wu, X., Hang, L., Wang, H., Shao, D., Xu, Y., Cui, W., & Chen, Z. (2016). Intranasally administered adjunctive Dexmedetomidine reduces perioperative anesthetic requirements in general anesthesia. *Yonsei Medical Journal*, *57*(4), 998. https://doi.org/10.3349/ymj.2016.57.4.998

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References

1. Agnes Healthcare. (2022, April 18). *Types of injections and sites*. LinkedIn. https://www.linkedin.com/pulse/types-injections-sites-agnes-healthcare

2. Brown, S., Rabenstein, K., & Doherty, M. (2024). Autism and anaesthesia: A simple framework for everyday practice. *BJA Education*, *24*(4), 129-137. https://doi.org/10.1016/j.bjae.2024.01.002

3. Doherty, M., McCowan, S., & Shaw, S. C. (2023). Autistic SPACE: A novel framework for meeting the needs of autistic people in healthcare settings. *British Journal of Hospital Medicine*, *84*(4), 1-9. https://doi.org/10.12968/hmed.2023.0006

4. Guthrie, D. B., Boorin, M. R., Sisti, A. R., Epstein, R. H., Romeiser, J. L., Lam, D. K., Gan, T. J., & Bennett-Guerrero, E. (2021). Retrospective comparison of intramuscular admixtures of ketamine and dexmedetomidine versus ketamine and midazolam for preoperative sedation. *Anesthesia Progress*, *68*(1), 3-9. https://doi.org/10.2344/anpr-67-04-02

5. Lai, M., Baron-Cohen, S., & Lombardo, M. (2014). Autism. *The Lancet*, *383*(9920), 896-910. https://doi.org/10.1016/S0140-6736(13)61539-1

6. *LMA® mad nasal™ / Intranasal mucosal atomization device | Medisecur*. (n.d.). MediSecur. https://medisecur.com/en/intranasal-mucosal-atomization-device-25-bte#

7. Selvey, P., Stypulkowski, K., & Waisbren, S. (2019). Surgical management of the patient living with autism. *Surgery Open Science*, *1*(2), 90-96. https://doi.org/10.1016/j.sopen.2019.06.006

8. Wu, X., Hang, L., Wang, H., Shao, D., Xu, Y., Cui, W., & Chen, Z. (2016). Intranasally administered adjunctive Dexmedetomidine reduces perioperative anesthetic requirements in general anesthesia. *Yonsei Medical Journal*, *57*(4), 998. https://doi.org/10.3349/ymj.2016.57.4.998