ISSN: 2584-0355
DOI: doi.org/10.51219/MCCRJ/Yousef-Almassalmeh/333

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Medical & Clinical Case Reports Journal

https://urfpublishers.com/journal/case-reports

Vol: 3 & Iss: 3

Case Report

Opioid-Free Total Intravenous Anesthesia in a Schizophrenia Patient with Retrosternal Goiter

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Citation: Almassalmeh Y, Abdellatif AA. Opioid-Free Total Intravenous Anesthesia in a Schizophrenia Patient with Retrosternal Goiter. *Medi Clin Case Rep J* 2025;3(3):1217-1219. DOI: doi.org/10.51219/MCCRJ/Yousef-Almassalmeh/333

Received: 05 August, 2025; **Accepted:** 06 August, 2025; **Published:** 08 August, 2025

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ABSTRACT

Introduction: Schizophrenia patients on serotonergic antipsychotics risk serotonin syndrome (SS) with opioids or 5-HT3 antagonists, alongside postoperative delirium and respiratory compromise related to Opioids. Green anesthesia minimizes environmental risks.

Case report: A female in her early 40s with schizophrenia and type 2 diabetes, on Aripiprazole, Quetiapine and Trihexyphenidyl, underwent thyroidectomy for a retrosternal goiter using opioid-free Total Intravenous Anesthesia (TIVA), avoiding Granisetron to reduce SS risk. No tracheomalacia or PONV occurred; minimal analgesics were needed, declined post-op.

Discussion: This approach prevented SS, delirium, cognitive decline and respiratory complications by avoiding opioid and 5-HT3 receptor interactions.

Conclusion: Opioid-free TIVA is safe and sustainable for high-risk patients.

Keywords: Opioid-free TIVA, Green anesthesia, Serotonin syndrome, Postoperative delirium, Schizophrenia, Retrosternal goiter

Introduction

Schizophrenia patients on antipsychotics with 5-HT receptor activity (e.g., 5-HT1A agonism, 5-HT2A antagonism) face risks of serotonin syndrome (SS) with opioids like fentanyl or 5-HT3 antagonists like Granisetron[1]. Opioids also increase postoperative delirium, cognitive decline and respiratory compromise, particularly in patients with airway challenges from retrosternal goiter[2,3]. Schizophrenia patients often exhibit higher pain thresholds, possibly due to altered opioid or dopamine receptor function, reducing analgesic needs. Green anesthesia, avoiding volatile anesthetics and minimizes environmental and clinical risks[4]. This case report describes opioid-free TIVA in a female with schizophrenia, chosen to prevent SS, delirium, cognitive decline, respiratory compromise and pharmacokinetic interactions[1,4].

Case Presentation

A female in her early 40s with chronic schizophrenia, recurrent depression and type 2 diabetes, managed with Aripiprazole (partial 5-HT1A agonist, 5-HT2A antagonist), Quetiapine (5-HT2 antagonist) and Trihexyphenidyl (anticholinergic, minimal serotonergic activity), presented for

elective thyroidectomy due to a retrosternal goiter. Ultrasound showed a multinodular goiter with bilateral large nodules and retrosternal extension; CT confirmed tracheal narrowing, indicating a difficult airway and risk of postoperative respiratory compromise, including tracheomalacia. Laboratory tests were normal and she was euthyroid. Opioid-free TIVA was selected, avoiding Granisetron, to prevent SS, delirium, cognitive decline, respiratory complications and pharmacokinetic interactions, leveraging her likely high pain threshold[1].

Anesthetic Management

- **Pre-induction:** Dexmedetomidine (12 µg IV), Glycopyrrolate (100 µg IV).
- **Induction:** Propofol (BIS <60), Ketamine (50 mg IV), Rocuronium (50 mg IV) after confirming mask ventilation; Sugammadex was available. A 50 mg dose of ketamine achieves NMDA receptor saturation, as described by Friedberg[5].
- **Airway:** Failed 7.0 tube as airway narrowing; 6.5 tube placed via video laryngoscope, ventilation confirmed without trauma.
- **Block:** US guided Bilateral superficial cervical plexus block.
- **Maintenance:** Propofol (BIS 40-60), Dexmedetomidine (12 µg IV), stable hemodynamics (BP 110–140 mmHg) over 3 hours.
- **Emergence:** Propofol stopped 5 minutes pre-extubation; patient oriented within 5 minutes.
- **Analgesia:** Paracetamol (1 g IV) and Lornoxicam (8 mg IV) 15 minutes before surgery end; no analgesics needed in recovery; offered but declined on postoperative days 1 and 2, consistent with a high pain threshold.
- **PONV prophylaxis:** Granisetron avoided to minimize SS risk; no PONV during 1.5-day hospital stay, no antiemetics required.

No tracheomalacia was observed post-op. The patient recovered without respiratory, pain or cognitive complications, reporting feeling calm pre-surgery, with no postoperative pain, nausea or confusion and resumed daily activities smoothly.

Discussion

This case demonstrates opioid-free TIVA efficacy in a female with schizophrenia undergoing thyroidectomy for a retrosternal goitre. The multimodal approach-Propofol, Dexmedetomidine, Ketamine and regional analgesia-ensured stable hemodynamic, effective analgesia and rapid recovery without serotonin syndrome (SS), postoperative delirium, cognitive decline or respiratory complications, including. The patient's antipsychotics, Aripiprazole (partial 5-HT1A agonist, 5-HT2A antagonist) and Quetiapine (5-HT2 antagonist), increased SS risk, necessitating avoidance of opioids and Granisetron to minimize 5-HT receptor interactions, respiratory compromise and pharmacokinetic interactions[1,6,7].

SS is a critical risk with opioids like fentanyl, which has mild serotonin reuptake inhibition[1]. Case reports document SS in schizophrenia patients, including a male on Paroxetine developing SS after fentanyl post-tracheostomy[5] and another on sertraline and Aripiprazole post-fentanyl during surgery[7]. Aripiprazole and Quetiapine's 5-HT activity, unlike Trihexyphenidyl's minimal effects, amplifies SS risk and Granisetron's 5-HT3 antagonism could theoretically exacerbate this[1]. No PONV occurred during the 1.5-day hospital stay, supporting Granisetron avoidance.

Postoperative delirium and cognitive decline are concerns in schizophrenia patients. A systematic review linked meperidine to delirium, with other opioids showing inconsistent effects[2]. A cohort study found low opioid doses increased delirium risk (RR 5.4, 95% CI 2.4-12.3), suggesting undertreated pain as a factor[3]. An ICU study associated higher opioid doses with delirium[8]. Meta-analyses confirm delirium predicts cognitive decline, with schizophrenia patients at higher risk[9,10]. Opioids also risk respiratory depression, critical in retrosternal goitre cases[8].

The patient required only intraoperative Paracetamol (1 g IV) and Lornoxicam (8 mg IV), declining further analgesics, likely due to a high pain threshold common in schizophrenia, possibly from altered opioid or dopamine receptor function. Ketamine's 50 mg dose achieved NMDA receptor saturation, providing effective analgesia without serotonergic or respiratory effects, as noted by Friedberg[6]. Dexmedetomidine reduced delirium risk[11], while the cervical plexus block and BIS-guided Propofol minimized analgesic and delirium risks[4]. The absence of SS, delirium, cognitive decline and PONV supports this approach's efficacy. As green anaesthesia, it avoided volatile anaesthetics, reducing environmental impact[4]. This case advocates for opioid-free protocols in psychiatric patients with airway challenges, considering 5-HT receptor interactions and pharmacokinetics[1,11,4].

Conclusion

Opioid-free TIVA is a safe, sustainable strategy for schizophrenia patients, preventing SS, delirium, cognitive decline and respiratory complications by avoiding 5-HT receptor interactions[1,11,4].

Learning points

Opioid-free TIVA is effective for schizophrenia patients on serotonergic medications undergoing major surgery.

Avoiding opioids and 5-HT3 antagonists like Granisetron prevents SS, delirium, cognitive decline and respiratory compromise[1,6,7].

Multimodal analgesia (e.g., Paracetamol, Lornoxicam, regional blocks) ensures pain control, especially with high pain thresholds in schizophrenia.

Dexmedetomidine and BIS-guided sedation minimize delirium risk[11,4].

Preoperative planning, including airway assessment and pharmacokinetic considerations, is critical for retrosternal goiter cases[1].

References

1. Rastogi R, Swarm RA, Patel TA. Opioid association with serotonin syndrome: Implications to the practitioners. Anesthesiology 2011;115:1291-1298.
2. Fong HK, Sands LP, Leung JM. The role of postoperative analgesia in delirium and cognitive decline in elderly patients: a systematic review. Anesth Analg 2006;102:1255-1266.
3. Morrison RS, Magaziner J, Gilbert M, et al. Relationship between pain and opioid analgesics on the development of

delirium following hip fracture. J Gerontol A Biol Sci Med Sci 2003;58:76-81.

4. Forget P, Borovac JA, Thackeray E, et al. Opioid-free anesthesia: a systematic review and meta-analysis. J Clin Anesth 2020;66:109930.
5. Friedberg BL. Propofol-ketamine technique: dissociative anesthesia for office surgery (a 5-year review of 1264 cases). Anesth Analg 2007;104:104-10.
6. Botros M, Sikaris J, Halpern J, et al. Serotonin syndrome following a fentanyl infusion. Chest 2015;148:322.
7. Smischney NJ, Pollard EM, Nookala AU, et al. Serotonin syndrome in the perioperative setting. Am J Case Rep 2018;19:833-5.
8. Duprey MS, Devlin JW, Griffith JL, et al. Opioid use and subsequent delirium risk in critically ill adults. Am J Respir Crit Care Med 2021;204:566-575.
9. Goldberg TE, Chen C, Wang Y, et al. Association of postoperative delirium with cognitive outcomes: a meta-analysis. J Clin Anesth 2021;73:110374.
10. Kunicki ZJ, Ngo LH, Marcantonio ER, et al. Six-year cognitive trajectory in older adults following major surgery and delirium. JAMA Intern Med 2023;183:442-450.
11. Su X, Meng ZT, Wu XH, et al. Dexmedetomidine for prevention of delirium in elderly patients after non-cardiac surgery. Lancet 2016;388:1893-902.