

Peritonsillar Block as a Treatment For Post-Tonsillectomy Pain In Pediatric Patient

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Abstract

Background: Postoperative pain remains one of the most common and distressing complaints following tonsillectomy in children. Among the various strategies explored, regional anesthesia techniques have gained attention for their ability to provide targeted analgesia with minimal systemic side effects. Our objective is to evaluate the effectiveness of ropivacaine and dexamethasone in controlling postoperative pain in children undergoing tonsillectomy, with a focus on its potential to improve recovery outcomes and patient satisfaction.

Case: This case involved an 8-year-old male patient who exhibited classic symptoms of OSA, who underwent tonsillectomy procedure. In the anesthetic management, the patient received premedication with midazolam, ondansetron, and intravenous paracetamol. Induction was achieved using propofol, fentanyl, and atracurium, while anesthesia maintenance was provided with Sevoflurane. Prior to extubation, bilateral injections of ropivacaine and dexamethasone were administered in the peritonsillar fossae. Postoperative pain assessments indicated mild pain, with no occurrence of nausea or vomiting. The patient was discharged one day after surgery with manageable pain.

Discussion: This case highlights the potential benefit of pre-extubation peritonsillar infiltration with 0.2% ropivacaine (3 mL) and dexamethasone for postoperative pain control. This multimodal, opioid-sparing approach may reduce central sensitization, minimize opioid-related adverse effects, and improve postoperative recovery. Although recent evidence suggests ropivacaine provides superior analgesia at 24 hours compared with bupivacaine, variability in pain timing underscores the need for further research on optimal administration strategies.

Conclusion: This case highlights the effectiveness of ropivacaine and dexamethasone in controlling postoperative pain in children.

Keywords: Dexamethasone; pain measurement; peritonsillar block; ropivacaine

Introduction

Obstructive sleep apnea (OSA) is a significant health concern in the pediatric population, affecting approximately 1% to 4% of children,¹ predominantly between the ages of 2 and 14 years.² The prevalence of OSA in children is notably lower than in adults, with reported

rates ranging from 1.1% in preschoolers to 4% in school-aged children. The incidence of OSA in children exhibits two distinct peaks: the first occurring between the ages of 2 and 8, primarily attributed to adenotonsillar hypertrophy (ATH), and a second peak during adolescence, often linked to increased body weight. Pediatric OSA carries substantial

health implications that warrant early recognition and appropriate management.³

Given the potential consequences of untreated OSA, including impaired growth, neurocognitive deficits, and cardiovascular complications, timely intervention is essential. Surgical intervention, particularly tonsillectomy, is widely recognized as an effective treatment for OSA in children, particularly when hypertrophy of the tonsils is the primary contributing factor. The management of anesthesia in pediatric patients undergoing this procedure requires careful consideration of the unique physiological characteristics and potential comorbidities associated with OSA.⁴⁻⁶

Post-tonsillectomy pain is one of the most frequent and clinically significant sequelae following tonsil removal in children. Although tonsillectomy is widely regarded as a routine and generally safe outpatient procedure, postoperative pain remains nearly universal and often reaches moderate to severe intensity, particularly during the first several postoperative days. In many children, pain may persist for a week or longer, with peak severity typically occurring between postoperative days 1 and 5. The burden of post-tonsillectomy pain extends beyond individual patient discomfort and has broader healthcare implications. Poorly controlled pain is associated with decreased oral intake, sleep disturbance, delayed recovery, and increased caregiver anxiety. Furthermore, inadequate pain management contributes to unplanned healthcare utilization, including calls to primary care providers and visits to emergency departments. These patterns highlight the high prevalence and clinical relevance of post-tonsillectomy pain as a public health concern within pediatric surgical care.⁷⁻⁹

This case report focuses on an 8-year-old male patient who presented with classic symptoms of OSA and underwent tonsillectomy. This study explored the anesthetic techniques that were employed, emphasizing the importance of individualized care in promoting postoperative recovery. By documenting this case, this study aim

to contribute to the existing literature on pediatric OSA and the efficacy of tailored anesthetic strategies, highlighting the need for continued awareness and research in this vital area of pediatric health.

Case Report

This case report discusses an 8-year-old male patient who underwent tonsillectomy due to symptoms indicative of obstructive sleep apnea (OSA). Patient presented with a height of 130 cm, weight of 38 kg, and a BMI of 22.4, along with a history of snoring during sleep, frequent awakenings, and daytime sleepiness. His STOP-BANG score was 3, indicating an intermediate risk of OSA.

For the surgical procedure, the patient received general anesthesia with pre-medications including midazolam (0.05 mg/kg), ondansetron (0.1 mg/kg), and intravenous paracetamol (500 mg). Induction was achieved with propofol (2 mg/kg), fentanyl (2 mcg/kg), and atracurium (0.5 mg/kg). Maintenance involved a mixture of oxygen and air with Sevoflurane at 2 vol%. The operation lasted approximately 1 hour and 40 minutes. Prior to extubation, a bilateral injection of 0.2% ropivacaine (3 mL into each tonsil) and dexamethasone (0.5 mg/kg) was administered in the peritonsillar fossae (Figure 1). Patient reported no nausea or vomiting and, at 6 hours post-surgery, began a clear liquid diet with only a sensation of thickness in the throat while swallowing.

Postoperative pain assessments were conducted at 1 hour, 6 hours, 12 hours, and 24 hours using the Wong-Baker Faces Pain Rating Scale and the Numeric Pain Rating Scale (NRS). The results indicated mild pain at 1 hour (Wong-Baker score of 2, NRS of 1), no pain at 6 and 12 hours, and a slight increase in pain at 24 hours (Wong-Baker score of 2, NRS of 1).

He was discharged 1 day after surgery with mild, manageable pain and was prescribed oral paracetamol (500 mg) for home use. This case highlights the effective management



Figure 1 Peritonsillar Infiltration Left and Right Tonsil in 8-Years Old Patient With Intermediate Risk of OSA

of postoperative pain and the importance of tailored anesthetic strategies in pediatric patient, leading to a favorable recovery without complications.

Discussion

The patient exhibited classic symptoms of OSA, including snoring, frequent awakenings, and daytime sleepiness. His STOP-BANG score of 3 indicated an intermediate risk for OSA,⁸ supporting the decision for surgical intervention. Previous studies have shown that addressing OSA through tonsillectomy can significantly improve symptoms and overall quality of life in children.⁴⁻⁶

The use of bilateral injections of ropivacaine and dexamethasone in the peritonsillar fossae prior to extubation represents a promising approach to managing post-tonsillectomy pain. The infiltration of local anesthetics like ropivacaine provides effective analgesia with minimal systemic side effects, making it particularly beneficial in the perioperative setting. The rationale for this technique is located in its ability to interrupt pain pathways before they reach the central nervous system, thus reducing the overall perception of pain during the recovery phase. Intraoperatively, the transmission of pain impulses contributes to a state of hyperexcitability in the central nervous system, which can be exacerbated by general anesthesia alone. By administering local anesthetics, it is possible to mitigate this

hyperexcitability and provide more effective analgesia postoperatively. Research has shown that combination of local anesthetic with dexamethasone as preemptive analgesia, before the onset of pain, can lead to reduced pain scores and lower opioid requirements after surgery.¹⁰⁻¹⁴

Opioids, though effective for managing pain, can lead to several adverse effects that complicate postoperative recovery, especially in vulnerable populations. Common side effects include respiratory depression, which can lead to hypoxemia and hypercarbia, especially concerning for those with obstructive sleep apnea. Additionally, opioids may cause sedation and delayed recovery, impairing a child's ability to mobilize post-surgery. These potential adverse effects highlight the need of alternative pain management strategies that minimize opioid use while ensuring effective analgesia.^{12,15,16}

Ropivacaine, as a member of the amino amide group of local anesthetics, offers certain advantages over other agents such as bupivacaine. Its pharmacokinetic profile, characterized by lower solubility and a shorter elimination half-life, allows for more predictable and controlled analgesia. In tonsillectomy procedures, the use of 0.25% bupivacaine with epinephrine is common. However, the introduction of 0.2%–0.5% ropivacaine, 3–5 mL, with or without dexamethasone, can further enhance analgesic

outcomes with minimal cardiovascular effect.^{17,18}

A recent meta-analysis published in September 2025 reported that, within the first 24 hours following tonsillectomy, ropivacaine was associated with a statistically significant reduction in postoperative pain when compared with bupivacaine. However, authors did not specify when the intervention was administered, thereby limiting interpretation regarding the influence of timing of administration on analgesic efficacy.¹⁸

Dexamethasone, not only aids in pain relief but also reduces inflammation, thereby potentially decreasing the overall discomfort associated with the surgical site. The addition of dexamethasone to the local anesthetic regimen has been documented to provide a synergistic effect. It can enhance the duration of analgesia and contribute to a reduction in the incidence of postoperative nausea and vomiting, which are common complications following tonsillectomy. This dual approach, targeting both pain and inflammation, supports a multimodal strategy to pain management that is becoming increasingly recognized as best practice in postoperative care.^{10,12-14}

Conclusion

This case illustrates the successful management of an 8 year old patient undergoing tonsillectomy for OSA. The careful selection of anesthetic agents, pain management strategies, and postoperative care contributed to a favorable outcome, highlighting the importance of a tailored approach in pediatric anesthesia. The use of bilateral injection of 0.2% ropivacaine (3 mL into each tonsil) and dexamethasone in the peritonsillar fossae prior to extubation presents a viable strategy for improving postoperative pain management in tonsillectomy patient. He was not only addresses immediate pain relief but also contributes to a smoother recovery process, preventing respiratory depression, minimizing the need for additional analgesics and potentially reducing hospital stay duration. But this finding appear to contradict

the most recent meta-analysis, which reported a significant reduction in pain at 24 hours postoperatively. In contrast, patients in the present study experienced no pain during the 6 hours and 12 hours postoperative period, followed by pain within 24 hours that was comparable in intensity to that reported at 1 hour after surgery. Future studies are needed to further explore the efficacy and safety of this combined approach in larger cohorts, so it will be strengthening its role in improved recovery protocols for tonsillectomy patients.

AI Use Disclosure

Artificial intelligence (AI) tools such as ChatGPT and google translate were used to assist in grammar correction and structuring the manuscript during the preparation of this article. The authors take full responsibility for the accuracy, integrity, and originality of the final manuscript.

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