



Pain control is comparable between opioid versus non-opioid management after otolaryngology procedures

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Abstract

Objective: The current study aims to measure patient-reported satisfaction with pain control using opioid and non-opioid medications after undergoing the following otolaryngology procedures: parathyroidectomy, thyroid lobectomy, total thyroidectomy, and bilateral tonsillectomy.

Materials and Methods: A prospective cohort study was performed at an academic medical center that included a telephone questionnaire and chart review. Opioid prescriptions, usage, and patient-reported pain outcomes were recorded. Bivariate analyses were used to compare opioid and non-opioid users.

Results: Of the 107 total patients undergoing otolaryngology procedures included in the study, 49 (45.8%) used an opioid for pain management postoperatively and 58 (54.2%) did not. Among the 81 patients who underwent endocrine procedures (parathyroidectomy, total thyroidectomy/lobectomy), most patients reported being “very satisfied” or “satisfied” with pain control whether they used opioids ($n = 27/30$, 90%) or not ($n = 50/51$, 98%). Of the 26 patients who underwent bilateral tonsillectomy, 19 (73%) were prescribed opioids and among these, most ($n = 17/19$, 89%) reported they were “very satisfied” or “satisfied” with pain control. In the non-opioid usage group, all patients ($n = 7/7$, 100%) reported they were “satisfied” with pain control. There was no statistically significant difference in patient-reported satisfaction with pain control between opioid and non-opioid users for any of the procedures listed.

Conclusion: The results of our study suggest that patients who did not use opioids have a similar level of satisfaction with pain control compared to those using opioids after thyroid, parathyroid and tonsillectomy surgeries. Considering the magnitude of the opioid crisis, providers should reassess the need for opioid prescriptions following certain ENT procedures.

Level of Evidence: IV.

KEYWORDS

opioids, pain control, thyroidectomy, tonsillectomy

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1 | INTRODUCTION

In the last decade, over 230 million opioid prescriptions were filled in retail pharmacies across the United States.¹ According to the Vermont Department of Health, the rate of opioid related deaths has increased steadily over the past 10 years.² Surgeons across various specialties have the second highest rate of opioid prescribing (37% of all prescriptions written) after pain medicine specialists.³ Various studies in Canada and the United States have found that there exists wide variability in opioid prescriptions across and within otolaryngology procedures.^{4,5} The range of variability is particularly prominent for painful surgeries like tonsillectomies.⁶ In an effort to standardize prescription practices, The American Academy of Otolaryngology recently published procedure-specific guidelines.⁷ Other research articles have outlined the benefits of using multimodal non opioid strategies for pain management in all patients undergoing ENT procedures.³ Recommendations include escalating to opioids for pain control that is inadequately controlled by non-opioid medications.³ Despite these recommendations, providers are wary of under prescribing opioid pain medication at the risk of improperly treating postoperative pain.

Current literature demonstrates that efforts are being made to limit the quantity and indications for postoperative opioid prescriptions in otolaryngology procedures.⁸ Guidelines suggest that first line management of pain after otolaryngologic surgery should be non-opioid medications, safe disposal options for unused opioid medications should be identified, and prior to surgery clinicians should set clear expectations about duration and severity of pain.⁸ From a clinician's standpoint, there is ample data supporting the benefits and guidelines of non-opioid medications compared to opioid medications, however, there is limited data on the patient perspective on pain control following common otolaryngology procedures. Understanding the patient's perspective is a critical component of managing surgical discharge, ensuring patient compliance and improving overall health outcomes.⁹ A prior study examined the association between decreased postsurgical opioid prescribing and patient satisfaction with surgeons. Researchers at Dartmouth-Hitchcock medical center found that there was no difference in mean satisfaction ratings of clinicians prior to and after reducing the number of opioid pills by 15 pills.¹⁰

The current study aims to evaluate patient perspectives on pain control to better understand satisfaction levels with opioid and non-opioid pain management. We hypothesize that patient satisfaction with pain control will be similar among patients prescribed opioids and patients who are not prescribed opioids.

2 | METHODS

2.1 | Data source and setting

The University of Vermont Medical Center conducted a prospective study using a patient telephone questionnaire conducted 1 week post-surgery. The questionnaire was followed by a retrospective chart review using patient data from January 2017 to September 2019.

Information on study design has been previously published by Fujii et al.¹¹ IRB approval was obtained through the University of Vermont Committee on Human Research in the Medical Sciences.

The present study analyzed patients undergoing four common otolaryngology procedures including parathyroidectomy, thyroid lobectomy, total thyroidectomy, and bilateral tonsillectomy. All patients included in the study were 18 years or older and were discharged home following the surgery. Researchers analyzed patient-reported outcome measurements which included the prospective telephone questionnaire and medications used for pain control as identified by chart review.

The standardized telephone questionnaire was conducted to assess patients' perspectives on pain management, as well as the quantity of opioid medication prescribed (including tramadol) and used after surgery. Patients who were recorded as not using opioids either chose not to use these medications or were not prescribed opioids. Questionnaire items included prompts regarding postoperative pain management efficacy, satisfaction, and expectations.

2.2 | Inclusion and exclusion criteria

Urgent, emergent, and elective ENT procedures were all considered for study eligibility. Patients with circumstances such as postoperative complications that may have significantly altered their levels of pain were excluded. Patients undergoing total thyroidectomy with central or lateral neck dissection were excluded. The urgent tonsillectomy case was due to worsening pain associated with chronic tonsillitis and the emergent case was due to a right-sided peritonsillar abscess. Other exclusion criteria included: patients who could not communicate independently through telephone (due to mental status, disability, or language barriers), those discharged to another facility such as prisons, nursing homes, or rehabilitation centers, and patients who could not be contacted after 4 call attempts. During the telephone calls, researchers obtained consent to review patient medical records. Chart review yielded demographic data, past medical and surgical histories, social histories, medications, and refills or new prescription for pain medication.

3 | INSTRUMENTS

The lead investigator developed a 111-item semi-structured questionnaire with contributions from participating clinical services (General Surgery, ACS, Orthopedics, Urology, OB/GYN, ENT, Vascular). The questionnaire collected both quantitative and qualitative data. The primary outcome measures were the quantity and proportion of opioids prescribed and utilized postoperatively. Questions on patient satisfaction with pain control were measured on a 4-point Likert scale (very unsatisfied, unsatisfied, satisfied, and very satisfied). Questions on the degree of pain control were similarly measured using a Likert scale (very poor, poor, well, very well). The present study specifically examined ENT procedures including parathyroidectomy, thyroid lobectomy, total thyroidectomy, and bilateral tonsillectomy.

3.1 | Statistical analysis

Fisher's exact test was used to compare patients who did and did not use opioids. Differences were considered statistically significant for p -values $<.05$. Analyses were conducted using SAS 9.4 (Cary, NC: SAS Institute Inc.).

4 | RESULTS

From 2017 to 2019, data were collected from 107 patients who underwent common otolaryngology procedures. Among these patients, 23 patients underwent a parathyroidectomy, 37 patients underwent a thyroid lobectomy, 21 patients underwent a total thyroidectomy and 26 patients underwent a bilateral tonsillectomy. The majority of patients in the 4 ENT surgical procedure groups identified as non-hispanic whites. All procedures were elective in this study aside from 1 urgent and 1 emergent bilateral tonsillectomy procedure. Most patients for parathyroidectomy, total thyroidectomy, and thyroid lobectomy were over the age of 40, while most patients undergoing tonsillectomy were under 40-years-old (Table 1). The vast majority of patients were of Caucasian/White race (Table 1). There was variability in alcohol, tobacco, and substance usage between the four procedures analyzed (Table 1).

4.1 | Parathyroidectomy

Of the 23 patients who underwent a parathyroidectomy, all 23 procedures were elective. One patient was using opioids 7+ days prior to the surgery. Post operatively, 17 patients reported no opioid usage and 6 patients reported opioid usage. Of the 17 patients who did not use opioids, 10 (59%) patients reported that their pain was very well controlled (Table 2). Among the 6 patients who did use opioids post-operatively, 5 (83%) reported that their pain was very well controlled (Table 2). Only 1 patient in the non-opioid usage group reported that pain was poorly controlled (Table 2).

Of the 17 patients who did not use opioids, 12 (71%) patients were very satisfied with pain control after discharge while 5 (83%) of patients who did use opioids were very satisfied with pain control after discharge. Only 1 patient in the non-opioid group was unsatisfied with pain control post-surgery. All patients in both groups were very satisfied or satisfied with their level of post-op care since leaving the hospital. 12 (71%) patients in the non-opioid group experienced pain that was less than expected while 3 (50%) patients in the opioid group experienced pain that was less than expected. All patients in both groups reported receiving just the right amount or more than the needed amount of pain pills (Table 2).

TABLE 1 Patient demographics.

Procedure	Parathyroidectomy		Total thyroidectomy		Thyroid lobectomy		Tonsillectomy	
	Any opioid use	No opioid use	Any opioid use	No opioid use	Any opioid use	No opioid use	Any opioid use	No opioid use
Total Patients	6	17	12	9	12	25	19	7
Age								
<40	1	3	4	1	1	4	17	5
40–54	1	3	4	3	7	8	1	2
55–69	1	5	4	4	4	12	0	0
70+	3	6	0	1	0	1	1	0
Sex								
Male	3	7	1	2	2	5	8	4
Female	3	10	11	7	10	20	11	3
Race								
White	6	16	11	9	12	25	18	6
Non-White	0	1	1	0	0	0	1	1
Current alcohol use	0	10	5	3	7	15	9	6
Tobacco use								
Current	0	2	3	1	1	0	1	2
Former	2	4	2	2	3	9	6	1
Never	3	11	7	6	8	16	12	4
Current substance use	0	0	2	0	0	1	3	0

Note: Demographic data for parathyroidectomy, total thyroidectomy, thyroid lobectomy, and tonsillectomy patients. Current alcohol and current substance use variables indicate patients who endorsed using alcohol and/or substances at the time of surgery.

TABLE 2 Patient satisfaction with pain control.

Procedure	Parathyroidectomy		Total thyroidectomy		Thyroid lobectomy		Tonsillectomy	
	Any opioid use	No opioid use	Any opioid use	No opioid use	Any opioid use	No opioid use	Any opioid use	No opioid use
Total # patients	6	17	12	9	12	25	19	7
Opioid use prior to surgery	0	1	1	0	1	0	0	0
Pain control since surgery								
Very well controlled	5 (83%)	10 (59%)	5 (50%)	7 (78%)	9 (82%)	21 (84%)	7 (37%)	0 (0%)
Well controlled	1 (17%)	6 (35%)	5 (50%)	2 (22%)	1 (9%)	4 (16%)	11 (58%)	7 (100%)
Poorly controlled	0 (0%)	1 (6%)	0 (0%)	0 (0%)	1 (9%)	0 (0%)	1 (5%)	0 (0%)
Very poorly controlled	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Satisfaction with pain control since leaving hospital								
Very satisfied	5 (83%)	12 (71%)	5 (42%)	8 (89%)	8 (73%)	18 (72%)	8 (44%)	0 (0%)
Satisfied	1 (17%)	4 (24%)	6 (50%)	1 (11%)	2 (18%)	7 (28%)	9 (50%)	7 (100%)
Unsatisfied	0 (0%)	1 (6%)	1 (8%)	0 (0%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)
Very unsatisfied	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (9%)	0 (0%)	0 (0%)	0 (0%)
Satisfaction with post-operative care since leaving hospital								
Very satisfied	5 (83%)	9 (53%)	3 (27%)	8 (89%)	5 (56%)	19 (76%)	8 (44%)	1 (14%)
Satisfied	1 (17%)	8 (47%)	8 (73%)	1 (11%)	4 (44%)	6 (24%)	10 (56%)	5 (71%)
Unsatisfied	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (14%)
Very unsatisfied	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Surgeon discussed expected pain pre-op								
No	1 (16%)	1 (6%)	2 (17%)	2 (22%)	3 (35%)	3 (12%)	1 (5%)	0 (0%)
Do not recall	0 (0%)	3 (18%)	0 (0%)	0 (0%)	2 (17%)	1 (4%)	0 (0%)	0 (0%)
Yes	5 (83%)	13 (76%)	10 (83%)	7 (78%)	7 (58%)	21 (84%)	18 (95%)	7 (100%)
Surgeon discussed pain management pre-op								
No	2 (33%)	3 (18%)	0 (0%)	0 (0%)	1 (8%)	1 (4%)	0 (0%)	0 (0%)
Do not recall	0 (0%)	1 (6%)	0 (0%)	0 (0%)	1 (8%)	1 (4%)	0 (0%)	0 (0%)
Yes	4 (67%)	13 (76%)	12 (100%)	9 (100%)	10 (83%)	23 (92%)	19 (100%)	7 (100%)
Actual Pain compared to expected pain								
More than expected	0 (0%)	0 (0%)	3 (25%)	1 (13%)	0 (0%)	2 (9%)	4 (21%)	2 (29%)
As expected	3 (50%)	5 (29%)	6 (50%)	1 (13%)	2 (18%)	1 (5%)	7 (37%)	3 (43%)
Less than expected	3 (50%)	12 (71%)	3 (25%)	6 (75%)	9 (82%)	19 (86%)	8 (42%)	2 (29%)
Given instructions on non-opioid pain management								
Yes	6 (100%)	16 (94%)	19 (100%)	7 (100%)	11 (92%)	25 (100%)	19 (100%)	7 (100%)
Prescribed right amount of opioid pills?								
Less than needed	0 (0%)	0 (0%)	1 (8%)	0 (0%)	1 (9%)	0 (0%)	1 (5%)	0 (0%)
Just the right amount	4 (67%)	3 (33%)	6 (50%)	4 (44%)	5 (45%)	4 (25%)	9 (47%)	0 (0%)
More than needed	2 (33%)	6 (67%)	5 (42%)	5 (56%)	5 (45%)	12 (75%)	9 (47%)	6 (100%)

Note: Survey results for parathyroidectomy, total thyroidectomy, thyroid lobectomy and tonsillectomy patients. Patient satisfaction with pain control scored based on a 4-point Likert scale for a range of questions.

4.2 | Thyroid lobectomy

Of the 37 patients who underwent a thyroid lobectomy, 25 patients reported no opioid use while 12 patients reported opioid use. All procedures were elective. Only 1 patient in the opioid usage group reported opioid usage 7+ days prior to the surgery. Among all 37 non-opioid usage and opioid usage patients, all but one patient reported that their pain was either very well controlled or well controlled (Table 2). The one patient who reported pain was poorly controlled was in the opioid usage group. All patients in the non-opioid usage group were either very satisfied or satisfied with their level of pain since surgery. All patients among both non opioid usage and opioid usage groups were either very satisfied or satisfied with their post-op care since leaving the hospital. Among the non-opioid usage patients, 19 (86%) patients had actual pain that was less than expected. For opioid usage patients, 9 (82%) patients had actual pain that was less than expected. All but one patient reported that either just the right amount or more than needed pain pills were prescribed. There was only 1 (9%) patient in the opioid usage group who reported that less than needed number of pain pills were prescribed. (Table 2).

4.3 | Total thyroidectomy

Of the 21 patients who underwent a total thyroidectomy, 9 reported no opioid use and 12 patients reported opioid use. All procedures were elective. One patient in the opioid use group reported prior opioid use 7+ days prior to the surgery. All 21 patients reported that pain control since surgery was either very well controlled or well controlled. All but one patient reported that their satisfaction with pain control since surgery was either very well controlled or well controlled (Table 2). The one patient who reported to be unsatisfied with pain control since leaving the hospital was in the opioid use group. All patients were either very satisfied or satisfied with post-op care since leaving the hospital. In the non-opioid use group, 1 (13%) reported actual pain experienced to be as expected, and 6 (75%) reported actual pain to be less than expected. In the opioid use group, 3 (25%) patients reported pain to be more than expected, 6 (50%) patients reported as expected, and 3 (25%) patients reported less than expected actual pain compared to original expectations. In the opioid use group, all but one patient reported that either just the right amount or more than needed amount of pain pills were prescribed. One patient in the opioid use group reported that less than needed amount of pain pills were prescribed. (Table 2).

4.4 | Bilateral tonsillectomy

Of the 26 patients who underwent a bilateral tonsillectomy, 7 reported no opioid use and 19 reported any opioid use. All but two procedures were elective in which 1 was urgent and 1 was emergent. All patients in the no opioid usage group reported well-controlled pain post-surgery. In the opioid usage group, 7 (37%) reported very well

controlled pain, 11 (58%) reported well-controlled pain, and 1 (5%) patient reported poorly controlled pain (Table 2). All but one patient in the opioid usage group was either very satisfied or satisfied with pain since leaving the hospital. Most patients in both the non-opioid and opioid usage groups were either very satisfied or satisfied with post-op care since leaving the hospital (Table 2). The one patient who was unsatisfied with post-op care since leaving the hospital was in the non-opioid use group. All patients in the non-opioid use group reported more than needed pain pills were prescribed. In the opioid use group, 1 (5%) patient reported less than needed, 9 (47%) patients reported just the right amount, and 9 (47%) patients reported more than needed pain pills were prescribed. (Table 2).

4.5 | Non-opioid pain medications used

In patients undergoing all four otolaryngology procedures, non-opioid pain medications were used in place of and in addition to opioid medications. Examples of non-opioid pain medications included acetaminophen, ibuprofen, naproxen, walking, and exercise (Table 3).

4.6 | Opioids prescribed versus used

Variation exists between the prescribing practices for common otolaryngology procedures. A total of 23 patients underwent parathyroidectomies, of which 14 were prescribed opioids (61%) and 6 of these patients actually used their prescription (43%) (Figure 1). In total thyroidectomies, all 21 patients received opioid prescriptions, of which 57% used their prescription (Figure 1). In thyroid lobectomies, 81% of patients received opioid prescriptions, of which 40% used their prescriptions (Figure 1). Of the 25 patients undergoing tonsillectomies, 24 were prescribed opioids (96%), of which 79% of patients used their prescription (Figure 1).

5 | DISCUSSION

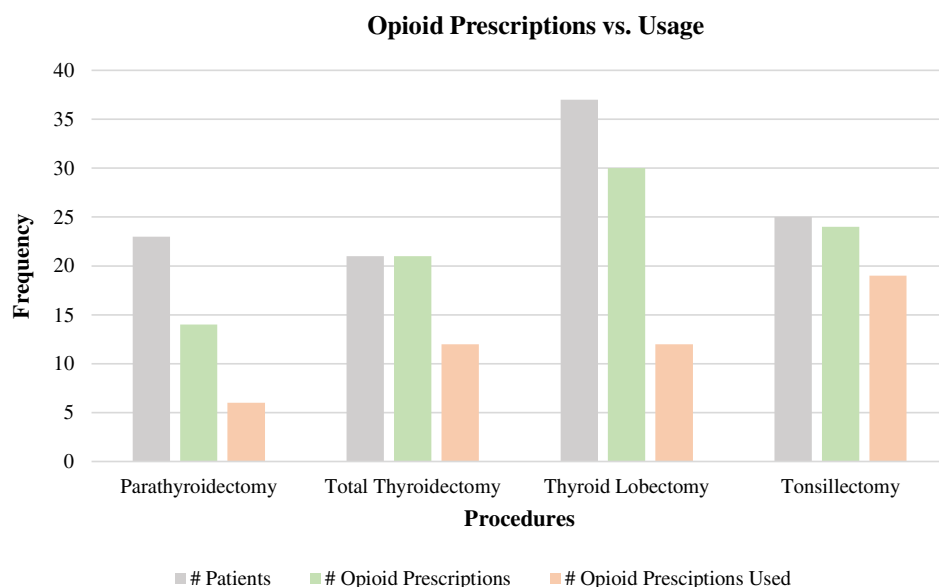
The opioid crisis in the United States is in part fueled by the overprescription of opioid medications following surgical procedures.¹² The consequences of prolonged opioid usage can be devastating, affecting individual patients and communities.¹³ The current literature examines opioid prescribing practices in otolaryngology from the perspective of clinicians. The present study reports on the perspectives of patients regarding their satisfaction with pain control using opioid and non-opioid medications as well as variations in opioid prescribing practices.

According to the American Academy of Otolaryngology, not all patients undergoing ENT procedures require opioid prescriptions postoperatively. For patients undergoing parathyroid and thyroid surgery, the expected opioid requirement is little, if any, due to the expected pain level being mild.¹⁴ In the present study, non-opioid users and opioid users report similar satisfaction with pain control for parathyroidectomies, thyroid lobectomies, and total thyroidectomies.

TABLE 3 Non-opioid use characteristics.

Procedure	Parathyroidectomy		Total thyroidectomy		Thyroid lobectomy		Tonsillectomy	
	Any opioid use	No opioid use	Any opioid use	No opioid use	Any opioid use	No opioid use	Any opioid use	No opioid use
	6	17	12	9	12	25	19	7
Non-opioid pain management strategy used								
Acetaminophen	5 (83%)	10 (59%)	6 (50%)	4 (44%)	6 (50%)	16 (64%)	17 (89%)	7 (100%)
Ibuprofen	3 (50%)	6 (35%)	7 (58%)	5 (56%)	7 (58%)	16 (64%)	14 (74%)	6 (86%)
Naproxen	1 (17%)	2 (12%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Walking/exercise	3 (50%)	9 (53%)	5 (42%)	4 (44%)	3 (25%)	12 (48%)	11 (58%)	1 (14%)

Note: Non-opioid pain medications used by patients undergoing parathyroidectomy, total thyroidectomy, thyroid lobectomy, and tonsillectomies.

**FIGURE 1** Opioids prescribed versus opioids use in common otolaryngology procedures. Graph demonstrating relationship between total number of patients, opioids prescribed, and opioids used for each procedure.

All of the patients undergoing total thyroidectomies rated their pain control as well or very well controlled.

Tonsillectomies are considered to be highly painful surgical procedures, requiring a need for opioid prescription to adequately manage pain.⁷ In the present study, the majority of patients undergoing tonsillectomies were prescribed opioids postoperatively. In contrast, only 61% of patients undergoing parathyroidectomy were prescribed opioids, demonstrating variability between prescribing practices of otolaryngologists. Sizable discrepancies exist between the proportion of opioids prescribed compared to the actual opioids used for parathyroid and thyroid surgery. In contrast, the proportion of opioids prescribed compared to actual opioids used is 79% for tonsillectomies. This is likely related to the higher expected pain associated with tonsillectomies compared to parathyroid and thyroid surgery. Despite the variation in expected pain, patients undergoing parathyroid and thyroid surgeries still received high levels of opioid prescriptions.

Patients in the non-opioid and opioid usage groups both reported that they received more pills than needed. Prior studies have found that a sizable proportion of prescribed opioids pills are

not used.¹⁵ The Centers for Disease Control recommends safe disposal of unused opioids at Drug Enforcement Administration-approved collection sites if possible. If no program is available, the FDA recommends flushing strong opioids down the toilet.³ Based on the current recommendations, the quantity of opioid medication prescribed for tonsillectomies can be limited to promote safe stewardship of opioids.

According to the American Academy of Otolaryngology clinical practice guidelines, it is strongly recommended to advise patients on the expected duration and severity of postoperative pain.⁷ Furthermore, clinicians should develop a multimodal treatment plan for managing postoperative pain and limit opioid therapy to the lowest effective dose for the shortest duration of time.⁷ A recent study found that the use of standardized order sets of opioid and non-opioid medications effectively reduced opioid doses dispensed to pediatric patients following tonsillectomies, without significantly affecting pain control.¹⁶ The present study identified that the vast majority of clinicians engaged in preoperative discussions about pain management across all of the procedures studied. There was no significant

difference between pain management discussions between patients prescribed opioid and those not prescribed opioids.

There are generalizability and data limitations to this study. The survey data does not capture the range of other otolaryngology procedures that are commonly performed at large medical centers such as myringotomy, sinus surgery, and septoplasty. Furthermore, the majority of patients identify as white, thus limiting the generalizability of the data to other racial groups. Co-morbid conditions were not included in the present study, which could be contributing factors to post-operative pain management. In addition, the small *N* values for parathyroidectomy, thyroid lobectomy, and tonsillectomy cases limit the true significance between opioid-users and non-users. In the cases of the urgent and emergent tonsillectomies, post-operative pain management could be influenced by the higher degree of pre-operative pain associated with chronic tonsillitis and a peritonsillar abscess.

Patients play a critical role in the discussion regarding opioid prescription guidelines. As recipients of these highly addictive medications, it is increasingly important to incorporate patient perspectives and engage in shared decision-making. In the present study, overall pain control and reported patient satisfaction did not differ significantly between those using opioids and those not using opioids. This finding lends further support to the argument for limiting opioid use postoperatively as appropriate.

6 | CONCLUSION

Patients undergoing common otolaryngology procedures report high levels of patient satisfaction with pain control postoperatively. Levels of satisfaction with pain control do not differ significantly between patients prescribed opioids and patients using non opioid medications.

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CONFLICT OF INTEREST STATEMENT

None of the authors have relevant financial or professional conflicts of interest to report.

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