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ARTICLE

Evaluating pain management strategies following hypospadias repair: a survey of pediatric urologists

Jaisa Kaufmann,[1*] Max Bouvette,[2] Abdul Qadar,[1] Dominic Frimberger,[1] Adam Rensing,[1] Bhalaajee Meenakshi-Sundaram,[1]

[1]Department of Urology, The University of Oklahoma Health Sciences Center, Oklahoma City, USA
[2]The University of Oklahoma College of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, USA

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Background: *Pediatric opioid use has been associated with serious adverse effects, including persistent use and overdose. Recent studies have shown that opioid needs may be minimal following outpatient pediatric urologic surgery. Post-operative pain regimens following pediatric penile surgery are not standardized. This study aimed to identify current opioid prescribing practices following hypospadias repair.*
Methods: *An online survey was administered to members of the Societies for Pediatric Urology, including eight questions surrounding physician demographics, hypospadias repair case volume, attitudes regarding opioid prescription in pediatric urology, and post-operative pain regimens. Responses were stratified for analysis.*
Results: *A total of 88 of 350 members responded to the survey, achieving a response rate of 25%. Most respondents practiced in an academic setting (73%) and had a case volume between 0–50 hypospadias repairs annually (76%). Only 26% of respondents reported using a standardized post-operative pain regimen following hypospadias repair. Respondents with higher case volumes were less likely to prescribe opioids. Following hypospadias repair, 61% of respondents reported regularly prescribing opioids, while 58% felt opioids are overprescribed following pediatric urologic procedures.*
Conclusions: *This study demonstrates wide variability in opioid prescribing patterns and attitudes among pediatric urologists. Despite growing evidence that opioids may not be necessary following pediatric urologic surgery, over half of pediatric urologists regularly prescribe opioids following hypospadias repair. Additionally, over half of the respondents believe opioids are over-prescribed. These findings represent an opportunity to improve opioid stewardship, which is meaningful given the ongoing opioid crisis. This demonstrates the need for evidence-based pain management guidelines following hypospadias repair.*

Key Words: hypospadias, practice patterns, physicians', pain, postoperative, surveys and questionnaires

Introduction

The opioid epidemic has led to significant drug-related morbidity and mortality in the United States since the 1990s. Deaths related to prescription opioids have increased across all age groups, warranting careful reevaluation of prescribing practices.[1] Often, acute post-operative pain may be appropriately treated with opioid analgesics. However, there is evidence that post-surgical opioid use can lead to persistent opioid use disorder, which has been shown across both adult and pediatric patient populations.[2] For example, in 2022 there were 6723 children and adolescents from 15–24 years of age who died of opioid overdose in the United States alone.[3] Given this, there has been increased focus on risk identification

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*Corresponding Author: Jaisa Kaufmann.
Email: jaisa-kaufmann@ou.edu

and prevention for opioid use disorder within the pediatric population.[2]

Surgeons are tasked with appropriately controlling post-operative pain to ensure smooth recovery while also upholding principles of good opioid stewardship. The opioid epidemic's presence within urology is supported by a 2023 article covering a large database of 33,000 pediatric patients undergoing procedures such as hypospadias repair, orchiopexy, and circumcision. This study demonstrated that patients receiving opioids following urologic surgery showed statistically higher odds of developing persistent opioid use compared to those who did not.[4]

Some studies have provided evidence that opioids may not be necessary following outpatient pediatric procedures, and have created interventions to improve opioid prescribing practices. Carolan et al. found that 82% of patients prescribed opioids after surgery had opioids leftover following recovery, and that 30% of those who used their opioid prescriptions only used 1–2 doses, suggesting opioids are overprescribed in pediatric urology.[5] After the implementation of educational efforts targeted to providers, surgical staff, and patient families, the number of providers prescribing opioid analgesics significantly decreased from 61% to 34%, while the number of patients who used opioids post-operatively significantly decreased from 55% to 28%. Interestingly, there was no significant decrease in opioid use after these efforts among the subset of patients who underwent hypospadias repair.[5] In comparing opioid and non-opioid pain regimens, one study with a subset of patients who underwent orchiopexy and circumcision found no significant difference in reported pain scores between patients who received opioids post-operatively and those who did not. As this study did not include patients undergoing hypospadias repair, it is not clear if these findings could be generalizable to this population.[6]

Postoperative pain regimens following hypospadias repair are not standardized, and there are no guidelines surrounding proper indications for opioid use following this surgery. Considerations for the decision to prescribe opioids may include concerns regarding inadequate pain control given repair complexity, difficulty assessing pain level in nonverbal children, or historical prescribing practices. While opioid prescribing following many routine outpatient pediatric urologic surgeries has been shown to be variable, opioid prescribing practices following hypospadias repair have not been well-described.[7] Thus, this study sought to evaluate and describe physician opioid prescribing practices in the United States and Canada following hypospadias repair, stratifying by urologist experience level, practice type, and case volume. By demonstrating these patterns, we aimed to better understand the prescribing practices of urologists and inform the evidence-based development of standardized pain medication regimens. We hypothesized that despite growing evidence that opioids may not be necessary, they remain widely prescribed by pediatric urologists following hypospadias repair.

Methods

After obtaining approval from the University of Oklahoma Institutional Review Board (IRB #12008), an anonymous online survey was constructed and administered to 350 pediatric urologists with active membership in the Society of Pediatric Urology (SPU) via email invitation through the SurveyMonkey® platform. The survey included eight closed-ended questions with multiple choices, including an additional "other" write-in option for the question regarding preferred perioperative pain management. Survey items included demographic questions such as time in practice, national region by AUA section, practice setting, and hypospadias repair volume. Members were also asked questions regarding opioid prescribing practices, including the use of any form of standardized post-operative pain control regimen following hypospadias repair within their practices, and opinions regarding opioid prescribing after outpatient pediatric urologic surgery. Questions were written in English and worded broadly in order for the survey to be generalizable to pediatric urologists in a variety of practice settings.

Using Qualtrics freely available sample size calculator, it was determined that between 76–184 responses would be needed to achieve a 95% confidence level. This volume of responses would allow us to generalize our findings to a group of 350 pediatric urologists with consideration of sampling error. There were no incentives offered to participants. No patients were involved in this study. All data collected from the survey were deidentified and sorted into a securely stored spreadsheet on institutional servers for further analysis. Analysis was performed using basic arithmetic functions in Microsoft Excel. No institutional resources were used to assist with survey design or review.

Results

Of the 350 pediatric urologists surveyed, a total of 88 members responded to the survey questionnaire, achieving a response rate of 25%. In regards to time in practice, 45% respondents reported being in practice for more than 15 years. A total of 64 respondents (73%) practice in an academic setting. Survey responses were received from all geographical sections of the AUA. A comprehensive breakdown of respondent demographics can be found in Table 1. Most respondents (76%) reported a case volume between 0–50 hypospadias repairs per year. For peri-procedural local anesthesia, 73% of respondents reported the use of caudal block, with the next most common response being penile block at 19%. Respondents who wrote in responses under "other" reported the use of pudendal block, obturator block, or allowing the choice of preoperative block to be determined by anesthesia.

Regarding prescribing practices, only 26% of respondents stated that members of their practice use any form of standardized post-operative pain medication regimen following hypospadias repair. With respect to pain management strategies, 61% of respondents reported they use opioids either as part of their standard postoperative pain medication regimen or for breakthrough pain following hypospadias repair. When stratified for case volume, respondents performing more than 50 hypospadias repairs per year were less likely to prescribe opioids when compared to those performing fewer than 50 hypospadias repairs per year (Figure 1). There were fifty-one respondents (58%) who felt that opioids are overprescribed following pediatric urologic procedures. When stratified by experience, those exceeding ten years of practice were less likely to feel that opioids are overprescribed following pediatric urologic procedures (Figure 2). A summary of case volume, pain regimens, and attitudes among survey respondents is provided in Table 1.

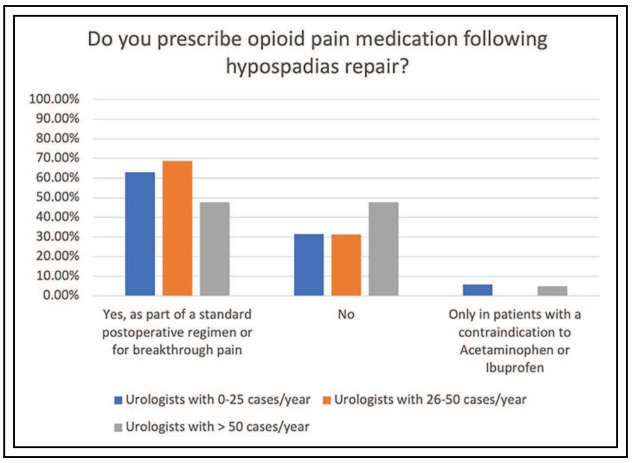

FIGURE 1. Opioid prescribing patterns following hypospadias repair, stratified by case volume

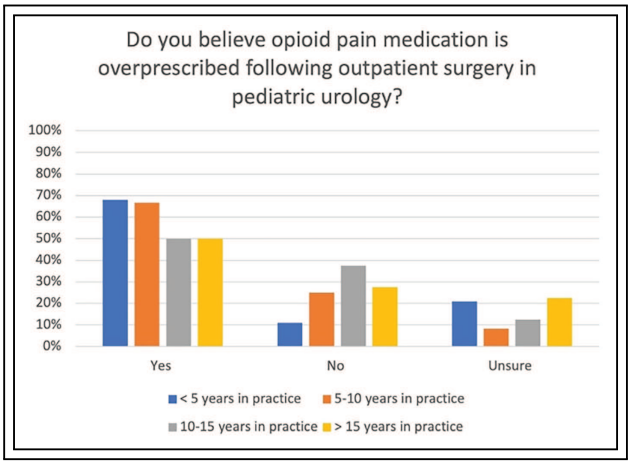

FIGURE 2. Pediatric urologist perspectives on opioid prescribing, stratified by time in practice

Discussion

Pediatric urologists are not firmly aligned in their approaches to pain management after hypospadias repair. Our survey demonstrates a wide array of opioid prescribing practices. Only 26% of respondents reported a standardized post-operative pain regimen used by their practice following hypospadias repair. Urologists with a higher case volume were less likely to prescribe opioids. Additionally, while 58% of pediatric urologists felt opioids are currently overprescribed, 61% reported regularly prescribing opioids following hypospadias repair. This discrepancy between prescribing attitudes and practices represents an opportunity to improve opioid stewardship within our field.

Several studies have demonstrated variation in opioid prescribing practices following common pediatric outpatient urologic surgeries, attributing this variation to a lack of evidence-based guidelines or clear indications to dictate opioid management.[7] Further, many studies have provided evidence that opioids are over-prescribed after outpatient pediatric urologic surgeries.[8] For example, a study by Bilgutay et al. showed that utilization of opioids after surgery is limited to 0–2 doses of medication, regardless of the penile, inguinal, or scrotal surgery

TABLE 1. **Survey items and responses**

Survey item	Responses (N = 88)	N (%)
How long have you been in practice?	<5 years	28 (32%)
	5–10 years	12 (14%)
	10–15 years	8 (9%)
	>15 years	40 (45%)
In which AUA section do you practice?	Northeast	6 (7%)
	New England	2 (2%)
	New York	5 (6%)
	Mid-Atlantic	6 (7%)
	Southeastern	15 (17%)
	North Central	15 (17%)
	South Central	16 (18%)
	Western	23 (26%)
What is your practice setting?	Academic	64 (73%)
	Non-academic	24 (27%)
How many hypospadias repairs do you perform per year?	0–25	35 (40%)
	26–50	32 (36%)
	>50	21 (24%)
What is your preferred pre/perioperative pain management strategy for hypospadias repairs?	Epidural/Spinal anesthesia	2 (2%)
	Caudal block	64 (73%)
	Penile block	17 (19%)
	Other (specify)	5 (6%)
Do you prescribe opioid pain medication following hypospadias repair?	Yes, they are part of my standard postoperative pain medication regimen	9 (10%)
	Yes, but only for breakthrough pain in patients taking scheduled Acetaminophen and Ibuprofen	45 (51%)
	Yes, but only in patients with a contraindication to Acetaminophen or Ibuprofen	3 (3%)
	No	31 (35%)
Is the use of opioid pain medication standardized among the members of your practice group following hypospadias repair?	Yes	23 (26%)
	No	44 (50%)
	No members of my group prescribe opioids following hypospadias repair	10 (11%)
	N/A	11 (13%)
Do you believe opioid pain medication is overprescribed following outpatient surgery in pediatric urology?	Yes	51 (58%)
	No	20 (23%)
	Unsure	17 (19%)

performed; this study was not, however, able to stratify results to compare simple and complex penile surgeries such as hypospadias repair.[9] There is also growing evidence that a combination of non-opioid medications such as acetaminophen, ibuprofen, and ketorolac can provide adequate pain relief in children undergoing outpatient urologic surgeries, many of whom underwent hypospadias repair.[5] In light of this, studies evaluating outcomes following opioid prescription and utilization have shown opioids may be minimized without increasing unplanned encounters or impacting patient quality of life.[10] There is

conflicting evidence, however, on whether this can be generalizable to patients undergoing hypospadias repair. For example, one study demonstrated that education-centered quality improvement measures were able to significantly decrease opioid prescribing without a significant change in post-operative pain scores.[11] In contrast to this, a study by Cornwell et al. demonstrated that patients discharged following hypospadias repair without opioids endorsed worse pain and had a higher likelihood of an impromptu pain-related provider encounter compared to those who received opioids post-operatively.[12]

There have been several alternative methods explored in an effort to reduce opioid prescribing and misuse.[13] These include policy-level implementations such as statewide prescription drug monitoring programs as well as provider-level initiatives such as educational presentations and patient handouts.[5,14] For example, a 2023 study showed an institution was able to reduce opioid prescribing by 50% by utilizing interventions such as post-discharge assessments, family education, and provider awareness.[15] Other studies have focused on the role of medical education in opioid stewardship, finding that residents may not be receiving in-depth opioid prescribing education, potentially leading to suboptimal prescribing behaviors.[16] In addition to this, there are a variety of anesthesia interventions that may optimize post-operative pain control. Intravenous dexamethasone has been shown to improve post-operative pain scores following hypospadias repair when used in combination with a nerve block.[17] Commonly used nerve blocks include penile blocks, pudendal blocks, and caudal blocks. Studies comparing different blocks for pain control following hypospadias repairs show conflicting evidence, with some results reporting superiority of one block compared to another and others reporting similar pain scores.[18–22] Future studies to elucidate optimal peri-operative nerve block may aid in the development of a standardized pain management pathway as a collaborative effort amongst pediatric urologists and anesthesiologists. Ultimately, a multi-modal approach involving several of these methods may be necessary to optimize our ability to minimize opioid prescribing and its associated morbidity.

Strengths of our survey include responses from urologists of widely varying practice locations, case volume, and experience levels. However, there are limitations that warrant discussion. First, our survey response rate of 25% suggests that our results may not be fully generalizable, particularly considering most responses came from academic urologists. Still, our response rate is comparable to that of a similar survey study sent to members of the Societies for Pediatric Urology to evaluate opioid prescribing practices.[23] Additionally, there are limitations inherent to our study design in the utilization of a non-validated survey. Our survey questions were intentionally broad in an effort to make the survey applicable to urologists in all practice settings; however, more specific questions regarding prescribing practices in a variety of scenarios may have been able to draw stronger conclusions regarding provider-based indications for opioid prescribing, such as the ability to stratify by patient age or meatal location. There may also be other factors that contribute to physician preferences in opioid prescribing, which were not accounted for and may be difficult to ascertain by a standardized questionnaire. Despite this, we believe the observations from this survey are valuable in that they suggest, despite knowledge of evidence demonstrating opioids are overprescribed, pediatric urologists do not universally implement these findings into practice.

This study illustrates the current state of pain management following hypospadias repair. Despite growing evidence that opioids may not be necessary in pediatric urology, they remain widely prescribed by over 60% of pediatric urologists following hypospadias repair. Additionally, over half of pediatric urologists state they believe opioids are overprescribed. This discrepancy represents an opportunity to improve opioid prescribing practices within pediatric urology. Given the wide variability in prescribing practices demonstrated, we believe this would be best accomplished with the development of a standardized postoperative pain regimen in order to unify prescribing practices amongst pediatric urologists for evidence-based practice. Further multi-institutional studies will be needed to prospectively compare opioid and non-opioid regimens following hypospadias repair to elucidate the indications, if any, for opioid use, determine optimal peri-operative analgesia in collaboration with our pediatric anesthesia colleagues, and create a standardized protocol for pain management.

Conclusions

This cross-sectional survey demonstrates variability in opioid prescribing practices and attitudes across pediatric urologists performing hypospadias repairs. Over half of pediatric urologists still appear to be regularly prescribing opioids following hypospadias

repairs, despite most believing they are overprescribed. These findings represent an opportunity to improve opioid stewardship within pediatric urology, which is meaningful given the ongoing opioid epidemic. This demonstrates the need for evidence-based pain management guidelines following hypospadias repair.

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Author Contributions

Jaisa Kaufmann: formal analysis, writing—original draft, review, and editing. Max Bouvette: writing—original draft, visualization. Abdul Qadar: investigation, writing—original draft. Dominic Frimberger: supervision. Adam Rensing: supervision. Bhalaajee Meenakshi-Sundaram: conceptualization, methodology, investigation, writing—review and editing, supervision. All authors reviewed the results and approved the final version of the manuscript.

Availability of Data and Materials

The authors confirm that the data supporting the findings of this study are available within the article.

Ethics Approval

University of Oklahoma Institutional Review Board approval was obtained for this study, IRB # 12008.

Informed Consent

Informed consent has been obtained from all participants in the study.

Conflicts of Interest

The authors declare no conflicts of interest to report regarding the present study.

References

1. Harbaugh CM, Gadepalli SK. Pediatric postoperative opioid prescribing and the opioid crisis. *Curr Opin Pediatr* 2019;31(3):378–385. doi:10.1097/MOP.0000000000000768.
2. Harbaugh CM, Lee JS, Hu HM, et al. Persistent opioid use among pediatric patients after surgery. *Pediatrics* 2018;141(1):e20172439. doi:10.1542/peds.2017-2439.
3. Miller M, Wheeler-Martin K, Bunting AM, Cerdá M, Krawczyk N. Changes in synthetic opioid-involved youth overdose deaths in the united states: 2018–2022. *Pediatrics* 2025;155(6):e2024069488. doi:10.1542/peds.2024-069488.
4. Grutman AJ, Stewart C, Able C, et al. Postoperative opioid prescribing in adolescents and young adults after urologic procedures is associated with new persistent opioid use disorder: a large claims database analysis. *Urology* 2023;182:211–217. doi:10.1016/j.urology.2023.08.031.
5. Carolan AMC, Parker KM, Grimsby GM. Opioid use after pediatric urologic surgery: is it really needed? *Urology* 2021;158:184–188. doi:10.1016/j.urology.2021.04.012.
6. Pace D, Mack SJ, Gong J, et al. Patient-reported outcomes in pain management after ambulatory pediatric general and urologic surgery. *J Pediatr Surg* 2023;58(9):1816–1823. doi:10.1016/j.jpedsurg.2023.01.049.
7. Morrison K, Herbst K, Corbett S, Herndon CD. Pain management practice patterns for common pediatric urology procedures. *Urology* 2014;83(1):206–210. doi:10.1016/j.urology.2013.08.041.
8. Sherrer R, Su R, O'Kelly F, et al. A prospective analysis of opioid use following outpatient pediatric urologic surgery. *Urology* 2022;168:183–188. doi:10.1016/j.urology.2022.07.006.
9. Bilgutay AN, Hua H, Edmond M, et al. Opioid utilization is minimal after outpatient pediatric urologic surgery. *J Pediatr Urol* 2020;16(1):108.e1–108.e7. doi:10.1016/j.jpurol.2019.10.021.
10. Mittal S, Shukla AR, Sahadev R, et al. Reducing postoperative opioids in children undergoing outpatient urologic surgery: a quality improvement initiative. *J Pediatr Urol* 2020;16(6):846.e1–846.e7. doi:10.1016/j.jpurol.2020.09.022.
11. O'Kelly F, Pokarowski M, DeCotiis KN, McDonnell C, Milford K, Koyle MA. Structured opioid-free protocol following outpatient hypospadias repair—a prospective SQUIRE 2.0-compliant quality improvement initiative. *J Pediatr Urol* 2020;16(5):647.e1–647.e9. doi:10.1016/j.jpurol.2020.06.012.
12. Cornwell LB, Campbell PC, Ewing E, Swords KA. Children undergoing outpatient complex penile surgery and hypospadias repair may not require opioid analgesics. *J Pediatr Surg* 2022;57(4):678–682. doi:10.1016/j.jpedsurg.2021.05.017.
13. Nelson R, Shimon T, Grimsby GM. Pediatric urologic surgery: reducing opioid use. *Paediatr Drugs* 2021;23(5):417–423. doi:10.1007/s40272-021-00462-2.
14. Theodorou CM, Jackson JE, Rajasekar G, et al. Impact of prescription drug monitoring program mandate on postoperative opioid prescriptions in children. *Pediatr Surg Int* 2021;37(5):659–665. doi:10.1007/s00383-020-04846-2.
15. Stout M, Alpert S, Kersey K, et al. Reducing opioid prescriptions after common outpatient pediatric urologic

surgeries: a quality improvement assessment. *Pediatr Qual Saf* 2023;8(1):e623. doi:10.1097/pq9.0000000000000623.
16. Chiu AS, Healy JM, DeWane MP, Longo WE, Yoo PS. Trainees as agents of change in the opioid epidemic: optimizing the opioid prescription practices of surgical residents. *J Surg Educ* 2018;75(1):65–71. doi:10.1016/j.jsurg.2017.06.020.
17. Khalifa SB, Slimene AB, Blaiti H, et al. The potentiating effect of intravenous dexamethasone upon preemptive pudendal block analgesia for hypospadias surgery in children managed with Snodgrass technique: a randomized controlled study: dexamethasone for pain management in children. *BMC Anesthesiol* 2024;24(1):145. doi:10.1186/s12871-024-02536-3.
18. Kendigelen P, Tutuncu AC, Emre S, Altindas F, Kaya G. Pudendal versus caudal block in children undergoing hypospadias surgery: a randomized controlled trial. *Reg Anesth Pain Med* 2016;41(5):610–615. doi:10.1097/AAP.0000000000000447.
19. Ozen V, Ozen N. Ultrasound-guided pudendal nerve block versus ultrasound-guided dorsal penile nerve block for pediatric distal hypospadias surgery. *Urol Int* 2023;107(4):370–376. doi:10.1159/000521718.
20. Hayaran N, Kaushik P, Yadav S, Hage A. A prospective observational study analyzing the analgesic efficacy of caudal block and nerve stimulator-guided pudendal nerve block in children undergoing hypospadias repair. *Cureus* 2023;15(9):e44649. doi:10.7759/cureus.44649.
21. Choudhry DK, Heredia L, Brenn BR, et al. Nerve stimulation guided bilateral pudendal nerve block versus landmark-based caudal block for hypospadias repair in young children: a prospective, randomized, pragmatic trial. *Reg Anesth Pain Med* 2022;47(12):744–748. doi:10.1136/rapm-2022-103680.
22. Aksu C, Akay MA, Şen MC, Gürkan Y. Ultrasound-guided dorsal penile nerve block vs neurostimulator-guided pudendal nerve block in children undergoing hypospadias surgery: a prospective, randomized, double-blinded trial. *Paediatr Anaesth* 2019;29(10):1046–1052. doi:10.1111/pan.13727.
23. Ahn JJ, Ellison JS, Merguerian PA. A Societies for Pediatric Urology survey of opioid prescribing practices after ambulatory pediatric urology procedures. *J Pediatr Urol* 2019;15(5):451–456. doi:10.1016/j.jpurol.2019.04.025.

