Scientific Research Publishing

Open Journal of Pediatrics, 2026, 16(1), 25-31
https://www.scirp.org/journal/ojped
ISSN Online: 2160-8776
ISSN Print: 2160-8741

Papillary Urothelial Neoplasms in Pediatric Patients: Case Report with Proposed Tailored Follow-Up

Sebastian Tobia Gonzalez*, Juan Pablo Corbetta, Leon I. Smith-Harrison

Division of Pediatric Urology, Driscoll Children's Hospital, Corpus Christi, TX, USA
Email: *sebastian.tobia@gmail.com

How to cite this paper: Tobia Gonzalez, S., Corbetta, J.P. and Smith-Harrison, L.I. (2026) Papillary Urothelial Neoplasms in Pediatric Patients: Case Report with Proposed Tailored Follow-Up. *Open Journal of Pediatrics*, **16**, 25-31.
https://doi.org/10.4236/ojped.2026.161003

Received: November 7, 2025
Accepted: January 2, 2026
Published: January 5, 2026

Abstract

Objective: Urothelial tumors are exceedingly rare in children and are typically low-grade and superficial with favorable outcomes. Current pediatric management protocols are often extrapolated from adult guidelines. We present a pediatric case of papillary urothelial neoplasm of low malignant potential (PUNLMP) and propose a tailored follow-up protocol based on literature review and clinical experience. **Methods:** A 16-year-old male presented with painless gross hematuria and was diagnosed with a solitary papillary bladder tumor. He underwent transurethral resection (TUR) with complete excision of the lesion. Imaging, histopathology, and follow-up data were reviewed. A literature review on pediatric urothelial tumors was conducted to compare current approaches and outcomes. **Results:** Histopathology confirmed PUNLMP, and the patient had an uneventful postoperative recovery. A single follow-up cystoscopy with ultrasound at three months demonstrated no recurrence. Subsequent non-invasive imaging at regular intervals up to 24 months has shown no evidence of disease. Based on the favorable course of this case and the findings from our literature review, we outline a proposed surveillance protocol intended for broader application in pediatric patients. **Conclusion:** PUNLMP in pediatric patients has an excellent prognosis, and TUR is typically curative in most of the cases. While the long-term follow-up protocol remains undefined, we recommend an initial cystoscopy with ultrasound, followed by non-invasive imaging-based surveillance. This tailored approach may reduce the burden of invasive procedures without compromising outcomes.

Keywords

Pediatric Urology, Papillary Urothelial Neoplasm of Low Malignant Potential (PUNLMP), Bladder Tumor, Case Report, Follow-Up Protocol,

Surveillance

1. Introduction

Urothelial tumors are among the most common malignancies in adult urology but are exceedingly rare in the pediatric population, representing less than 0.4% of all bladder tumors in children [1]. When they occur in children, these tumors are typically solitary, low-grade, and superficial, exhibiting benign behavior and a very low risk of recurrence or progression [2].

A comprehensive literature review was conducted using PubMed and Google Scholar databases with search terms including "pediatric urothelial tumor," "bladder tumor children," "PUNLMP pediatric," and "pediatric bladder neoplasm." Articles in English and Spanish published between 2000-2024 were included. Case reports, case series, and systematic reviews focusing on pediatric urothelial tumors were analyzed to compare management approaches and outcomes.

Due to the rarity of these tumors in children, standardized pediatric-specific guidelines for treatment and surveillance are lacking. Consequently, current management strategies are largely extrapolated from adult protocols, which may not accurately reflect the true nature of the disease in younger patients, potentially leading to unnecessary invasive procedures and psychological burden [3]-[5].

This article reports a case of a 16-year-old male with Papillary Urothelial Neoplasm of Low Malignant Potential (PUNLMP) and, based on a comprehensive literature review and clinical experience, proposes a pragmatic and tailored follow-up protocol specifically adapted for pediatric patients. This work has been reported in line with the SCARE criteria (Surgical Case Report Guidelines) [6].

2. Case Report

A previously healthy 16-year-old male presented to the emergency department with sudden-onset painless gross hematuria. There was no history of trauma, infection, or other urinary tract symptoms. Urinalysis revealed elevated red and white blood cell counts. His family history was notable for testicular cancer in his brother and esophageal cancer in a maternal uncle. There is no established genetic association between these malignancies and pediatric PUNLMP; therefore, the relevance of this family history to the present case is considered unknown.

Renal and bladder ultrasound revealed a lobulated mass measuring 1.64 × 0.75 × 1.26 cm on the right bladder floor (**Figure 1**). This finding was subsequently confirmed by contrast-enhanced computed tomography (CT). Cystoscopy performed under general anesthesia revealed a friable, papillary lesion on the right lateral posterior wall of the bladder, approximately 1 cm lateral to the ureteral orifice (**Figure 2**). Complete transurethral resection (TUR) of the tumor was performed, with electrocoagulation of the tumor base. No other abnormalities were noted in the urinary tract during procedure.

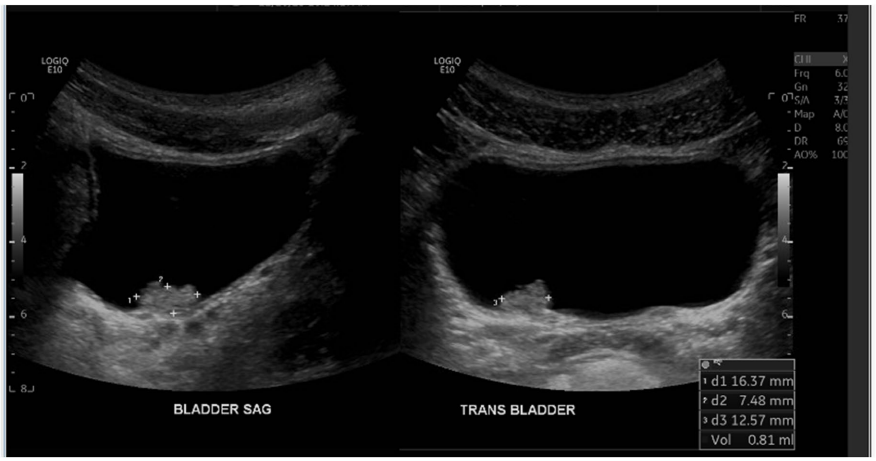

Figure 1. Bladder ultrasound revealed a lobulated mass.

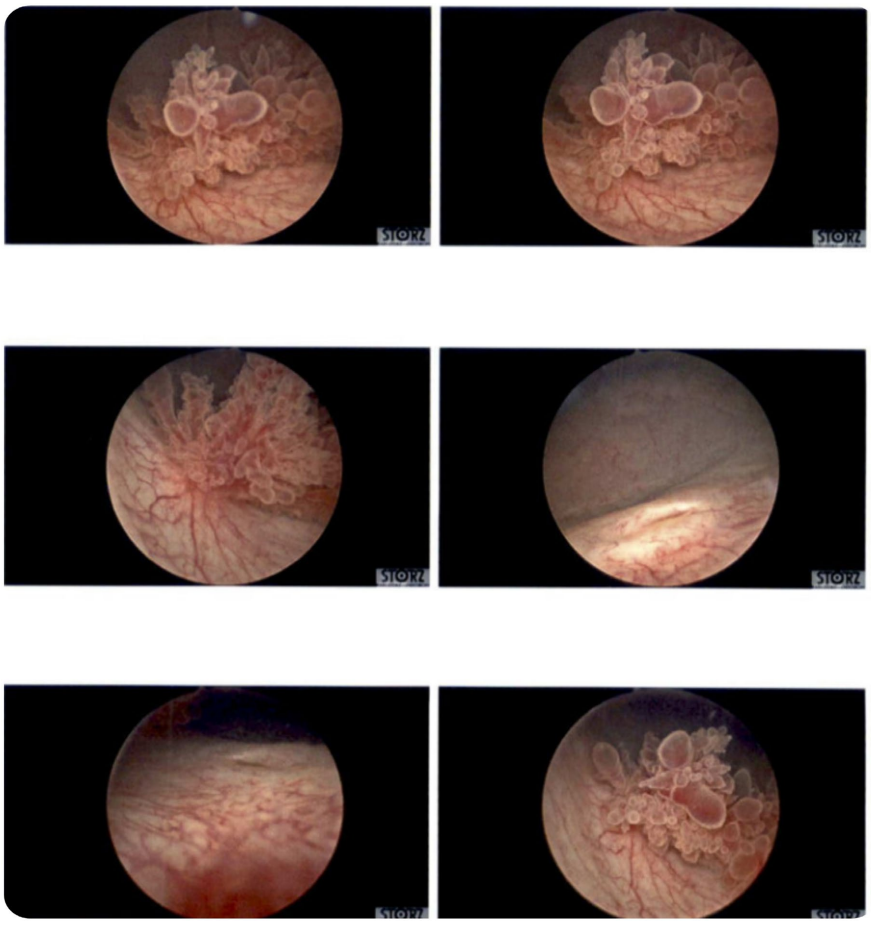

Figure 2. Cystoscopy revealed papillary lesion on the right lateral posterior wall of the bladder.

Histological analysis of the resected specimen diagnosed a Papillary Urothelial Neoplasm of Low Malignant Potential (PUNLMP) with mild lymphocytic submucosal inflammation. Crucially, there was no evidence of invasion or high-grade features.

The patient experienced transient hematuria postoperatively, requiring temporary catheterization. Follow-up cystoscopy and ultrasound at three months post-TUR showed no recurrence. Subsequent follow-up imaging at six months also revealed no abnormalities. Proposed continued follow-up with renal-bladder ultrasound every three months for two years, then every six months up to five years. The patient remains asymptomatic with no evidence of recurrence at 24 months of follow-up.

3. Discussion

Bladder tumors in children typically present as non-invasive, low-grade lesions with an inherently low risk of recurrence or progression. Papillary urothelial neoplasms of low malignant potential (PUNLMP) represent a distinct histological entity within this spectrum. They are characterized by minimal cytologic atypia and low proliferation indices, which collectively contribute to their highly favorable prognosis.

The 24-month recurrence-free course observed in our patient, despite using a minimally invasive surveillance strategy, reinforces the feasibility of adopting a less aggressive follow-up protocol in similar pediatric cases. This real-world outcome supports the shift toward ultrasound-based surveillance as a safe and effective alternative to repeated cystoscopies.

The largest pediatric series reported a recurrence rate of less than 10%, with virtually no progression to high-grade disease or muscle invasion (Rodriguez *et al.*, 2001; Fine *et al.*, 2007). This benign behavior in children stands in stark contrast to that observed in adult patients, where recurrence rates can range significantly from 30% to 80% depending on tumor grade and multiplicity [7].

Table 1 summarizes the key differences between adult and pediatric approaches to urothelial tumor surveillance.

Table 1. Comparison of adult versus pediatric surveillance protocols for urothelial tumors.

Parameter	Adult protocol	Proposed pediatric protocol
Initial follow-up	Cystoscopy every 3 months	Cystoscopy + US at 3 months
Short-term surveillance	Cystoscopy every 3 - 6 months	Ultrasound every 3 months
Long-term surveillance	Risk-stratified cystoscopy	Ultrasound every 6 months
Duration	Lifelong	5 years
Anesthesia requirement	Frequent	Minimal

US: Ultrasound.

Adult surveillance strategies commonly involve repeated cystoscopies every 3 - 6 months during the first two years, followed by less frequent evaluation based on risk stratification (AUA Guidelines, 2020). However, subjecting pediatric patients to repeated cystoscopies, often requiring general anesthesia, introduces both procedural risks and a significant psychological burden. Consequently, many authors have advocated for a less invasive follow-up strategy in children, particularly for

solitary, completely resected low-grade tumors [3]-[5] [7] [8].

Many authors have advocated for a less invasive follow-up strategy in children, particularly for solitary, completely resected low-grade tumors [3]-[5] [7] [8]. Berrettini *et al.* recommend one early cystoscopy followed by periodic ultrasonography, reserving repeat endoscopy only for symptoms or suspicious findings. Ko *et al.* emphasize that modern ultrasound has adequate sensitivity to detect pediatric recurrences, supporting ultrasound-only surveillance after the initial post-TUR evaluation. Cerrato *et al.* highlight the uniformly benign clinical course across published series and conclude that intensive cystoscopic schedules are not justified in this population. These aligned recommendations form the evidence basis for the protocol we propose.

Moreover, a recent systematic review by Cerrato *et al.* (2023), encompassing over 120 pediatric cases, concluded that the overall prognosis of PUNLMP in children is excellent, characterized by very low recurrence and negligible progression rates. The authors emphasize the critical need for multicenter pediatric registries to further refine evidence-based guidelines for this rare condition [9].

In our experience, and in alignment with the studies, we believe that aggressive cystoscopic protocols can be safely replaced by imaging-based monitoring, provided the initial lesion is low-grade, completely resected, and unifocal. Given the inherent rarity of these tumors, collaborative multicenter efforts are essential to validate long-term outcomes and develop robust, pediatric-specific recommendations.

3.1. Proposed Follow-Up Protocol

Based on our clinical experience and a thorough review of available literature, we propose the following tailored follow-up protocol for pediatric patients with resected low-grade urothelial tumors:

- Initial evaluation: Cystoscopy and renal-bladder ultrasound at 3 months post-TUR.
- Short-term follow-up: Ultrasound every 3 months for the first 2 years.
- Long-term follow-up: Ultrasound every 6 months from years 3 to 5.
- Cystoscopy: Reserved for patients with suspicious imaging findings or new-onset hematuria.

This pragmatic approach aims to reduce the patient's exposure to anesthesia and invasive procedures while maintaining vigilant surveillance for recurrence, striking a balance between effective monitoring and patient safety.

This protocol is based on Level C evidence (case reports and expert opinion) given the rarity of pediatric urothelial tumors. The reduced invasiveness is justified by the consistently benign behavior of these tumors in children, with recurrence rates <10% reported in the largest series published to date (Rodriguez *et al.*, 2001; Fine *et al.*, 2007; Berrettini *et al.*, 2015). These studies collectively support limiting cystoscopy to cases with abnormal imaging or recurrent hematuria.

3.2. Limitations

This case report has several limitations that should be acknowledged. First, rec-

ommendations are based on a single case with relatively short follow-up period (24 months), which may not capture late recurrences. Second, the proposed surveillance protocol lacks validation through multicenter studies due to the rarity of pediatric urothelial tumors. Third, cost-effectiveness analysis of the proposed protocol compared to standard adult guidelines was not performed. Finally, the generalizability of these findings may be limited given the heterogeneity in presentation and biology of pediatric urothelial neoplasms. Prospective multicenter registries are needed to validate long-term outcomes and refine evidence-based guidelines for this rare condition.

4. Conclusion

Papillary Urothelial Neoplasm of Low Malignant Potential (PUNLMP) in pediatric patients carries a highly favorable prognosis and a low risk of recurrence. Transurethral resection is typically curative for these lesions. Given the benign nature of these tumors in the pediatric population, a less invasive follow-up strategy is clearly warranted. We strongly advocate for an ultrasound-based surveillance protocol with selective use of cystoscopy, as it offers an optimal balance between effective disease monitoring and ensuring patient safety and comfort.

Declaration about Any AI-Assisted Writing Tools Used

During the preparation of this work the authors used Claude to edit the manuscript. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Ethical Approval

Ethical review and approval were waived for this case report because it describes a single anonymized patient treated according to standard clinical practice and involves no identifiable data.

Informed Consent

Written informed consent for publication of this anonymized case report and accompanying images was obtained from the patient's legal guardian in accordance with institutional policies.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] Benson Jr., R.C., Tomlinson, M.J. and Whittick, J.W. (1983) Transitional Cell Carcinoma of the Bladder in Young Adults. *Journal of Urology*, **130**, 54-55. https://doi.org/10.1016/S0022-5347(17)50950-7

[2] Miraldi, M., Schober, M. and Gonzalez, R. (2004) Papillary Urothelial Neoplasms in Young Adults: A Distinct Clinical-Pathologic Entity? *British Journal of Urology International*, **94**, 311-316. https://doi.org/10.1111/j.1464-410X.2004.04929.x

[3] Berrettini, A., Castagnetti, M., Cimador, M., *et al.* (2015) Pediatric Urothelial Tumors: A Review of the Literature and a Proposed Surveillance Strategy. *Journal of Pediatric Urology*, **11**, 26.e1-26.e5. https://doi.org/10.1016/j.jpurol.2014.08.008

[4] Rodriguez, D., Koyle, M.A. and Gonzalez, R. (2001) Transitional Cell Carcinoma of the Bladder in Children and Adolescents: A Clinicopathologic Study of 15 Cases. *Journal of Urology*, **165**, 1869-1873.

[5] Fine, S.W., Reuter, V.E., Epstein, J.I. and Argani, P. (2007) Pediatric Urothelial Neoplasms: A Comprehensive Review. *Pediatric Developmental Pathology*, **10**, 266-273. https://doi.org/10.2350/06-10-0174.1

[6] Kerwan, A., Al-Jabir, A., Mathew, G., Sohrabi, C., Rashid, R., Franchi, T., *et al.* (2025) Revised Surgical Case Report (SCARE) Guideline: An Update for the Age of Artificial Intelligence. *Premier Journal of Science*, **10**, Article 100079. https://doi.org/10.70389/pjs.100079

[7] Babjuk, M., Burger, M., Compérat, E.M., Gontero, P., Mostafid, A.H., Palou, J., *et al.* (2019) European Association of Urology Guidelines on Non-Muscle-Invasive Bladder Cancer (Tat1 and Carcinoma in Situ)—2019 Update. *European Urology*, **76**, 639-657. https://doi.org/10.1016/j.eururo.2019.08.016

[8] Ko, D.S., Munhoz, R.R., Smith-Harrison, L.I., *et al.* (2021) Pediatric Bladder Tumors: Review and Contemporary Management. *Current Urology Reports*, **22**, Article 38.

[9] Cerrato, C., Rodriguez Socarras, M.E., Mantica, G., *et al.* (2023) Management and Outcomes of Papillary Urothelial Neoplasms in Children: A Systematic Review. *Journal of Pediatric Urology*, **19**, 45-52.