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Diagnosis and management of ureteral fibroepithelial polyps in children: A new treatment algorithm

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Summary

Introduction
Fibroepithelial polyps are benign mesenchymal tumors arising from the urinary tract. With the advent of endoscopy in the pediatric population, more reports of endoscopic diagnosis and treatment have appeared.

Objective
The present study reports experience with the diagnosis and treatment of fibroepithelial polyps of the upper urinary tract in the pediatric population. Incorporating past experience from literature, we propose an algorithm to guide the clinical diagnosis and treatment plan.

Study design
Four pediatric patients undergoing pyeloplasty for ureteropelvic junction (UPJ) obstruction were diagnosed with ureteral polyps. Their demographics, radiologic, surgical and pathologic information were reviewed. In addition, a comprehensive literature search using the MEDLINE database yielded 37 reports containing 126 cases of ureteral polyps, including 5 series with 57 cases and 9 cases of synchronous bilateral ureteral polyps.

Results
Of 123 pediatric patients undergoing pyeloplasty from 2008 to 2013, four (3.3%) were found to have fibroepithelial polyps of the upper urinary tract. All patients were male and the mean age of presentation was 12 years. Ureteral polyps predominantly occurred unilaterally in the left ureter (75%) and one case of bilateral ureteral polyps was encountered. Along with three other recent case series [1–3], the combined incidence of ureteral polyps in patients undergoing evaluation for ureteral obstruction was 5.2%. Intraoperative retrograde pyelogram was used to identify filling defects in 4 of 5 affected ureters (see Figure). Ureterorenoscopy was performed in all three patients with filling defects for polyp mapping along the ureter and evaluation of the macroscopic polyp appearance. Based on ureteroscopic findings, Holmium laser polypectomy was performed in two patients with single, pedunculated polyps. Anderson-Hynes dismembered pyeloplasty was performed in three patients with broad based, multilobulated polyps too large for endoscopic treatment and in one patient for undiagnosed polyp prior to pyeloplasty.

Discussion
The present study finds that the 5.2% combined incidence of ureteral polyps in contemporary reports may be higher than previously described [4]. Retrograde pyelogram was an effective tool in diagnosing ureteral polyp and ureteroscopy can be employed if ureteral polyps are suspected for both diagnostic and therapeutic purposes. Although clinical experience is limited, endoscopic laser treatment seems to be effective for the single, pedunculated ureteral polyps, while dismembered pyeloplasty is required for the broad based, multilobulated polyps. The study was limited by the rarity of ureteral polyps. Future multi-institutional collaborative studies are required to validate the diagnostic and treatment algorithm proposed.

Conclusion
Ureteral polyps cause approximately 5% of UPJ obstruction in the pediatric population. Diagnosis can be made in certain cases by intraoperative retrograde pyelogram. If a filling defect is encountered, ureteroscopy is indicated for polyp mapping. The treatment modality is dictated by the endoscopic appearance of the ureteral polyp.

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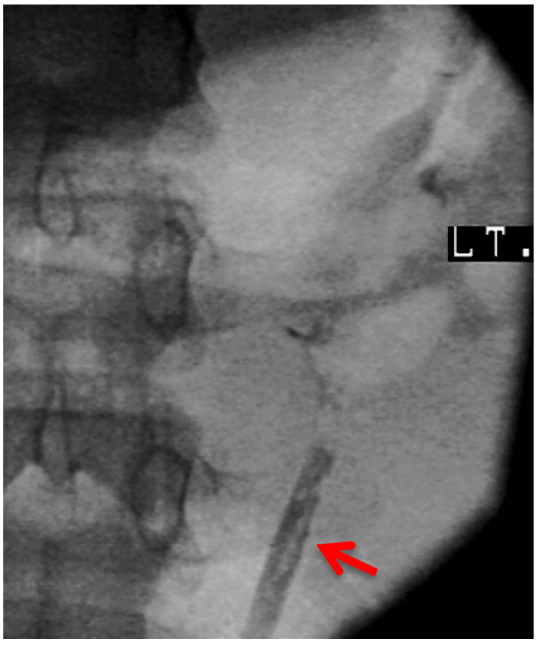

Ureteral polyps on retrograde pyelogram.

Introduction

Fibroepithelial polyps are benign mesenchymal tumors that can arise anywhere along the urinary tract. Previously, the incidence of fibroepithelial polyps in the upper urinary tract was thought to be exceedingly low, consisting of only 0.5% of all causes of UPJ obstruction in the pediatric population [4]. The occurrence of synchronous, bilateral ureteral polyps is even scarcer, with only nine reports in the English literature [3—9]. Different phenotypes of fibroepithelial polyps have been noted: some are long, cylindrical masses, whilst others are shorter, wider and more likely to cause urinary obstruction [5]. Clinically, this entity mimics the symptoms of intrinsic UPJ obstruction and is often undiagnosed until the time of pyeloplasty.

With the advent of ureteroscopy in the pediatric population, more recent reports of endoscopic diagnosis and treatment of ureteral polyps have appeared. However, the role of endoscopy to complement open repair has not been clearly defined. The present study reports experience with the diagnosis and treatment of fibroepithelial polyps of the upper urinary tract in the pediatric population. Along with information gathered from a comprehensive literature review, an algorithm has been constructed in an attempt to help guide treatment plans.

Material and methods

After approval by the Institutional Review Board, a retrospective chart review of 123 pediatric patients (0—17 years) undergoing pyeloplasty between August 2008 and December 2013 at a single academic children's hospital was conducted. Four cases of UPJ obstruction associated with ureteral polyps were identified. Patient demographics as well as clinical, diagnostic, intraoperative, pathologic and follow-up data were reviewed.

In addition, a comprehensive MEDLINE literature search yielded 37 reports containing 126 cases of ureteral polyps in the pediatric literature, including five case series representing 45.0% of the reported cases (see Table 1). The reported incidence, patient demographics, diagnostic, treatment and follow-up data in all reports were reviewed.

Results

At the present hospital, between August 2008 and December 2013, a total of 123 pediatric pyeloplasties were performed by two surgeons (DDB and DAC). Among them, four patients (3.3%) with ureteral polyps were identified. All patients were male and their ages ranged from 8 to 16 years (mean 12 years). The ureteral polyps occurred in the left ureter in three out of the four patients (75.0%) and were bilateral in one patient (25.0%). All four patients presented with flank pain, and associated nausea and vomiting.

All patients were initially evaluated with renal ultrasound, which showed hydronephrosis on the symptomatic side, but failed to identify the ureteral polyps. Urinalysis showed microscopic hematuria in two patients and pyuria in another. Urine cultures were negative in all patients. All patients underwent diuretic MAG3 renogram, which demonstrated unequivocal mechanical obstruction in three of the five affected ureters ($T_{1/2} > 20$ min); equivocal obstruction in another ($T_{1/2} = 14$ min); and no obstruction in the last ureter ($T_{1/2} = 8$ min). Ipsilateral renal function ranged from 45.0% to 58.0% in the three patients with unilateral ureteral polyps. In the patient with bilateral

Table 1 Case series of pediatric ureteral fibroepithelial polyps.

	Number of patients	Incidence	Number of bilateral polyps	Detection using urography	Endoscopic treatment	Pyeloplasty	Follow-up length (month)	Incidence of recurrence
Adey et al. (2003)	9	0.5%	2	28.5%	0	100.0%	48	0
Niu et al. (2007)	15	4.6%	1	26.7%	0	100.0%	n/a	n/a
Kara et al. (2010)	5	5.9%	0	0.0%	100.0%	0	12	0
Kojima et al. (2011)	14	7.0%	0	21.4%	100.0%	100.0%	>12	9[a]
Bian et al. (2011)	13	n/a	2	100.0%	0.0%	100.0%	16	0
Current	4	3.3%	1	75.0%	50.0%	100.0%	10	0
Total	60	5.2%	6	43.1%	35.0%	91.7%	—	9

[a] 9 total recurrences in six patients.