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Minor procedure, major impact: Patient-reported outcomes following urethral meatotomy

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Summary

Introduction

Urethral meatotomy as treatment for meatal stenosis is a common pediatric urology procedure; however, little is known about the patient experience following this procedure.

Objective

We aim to evaluate clinical factors associated with patient-reported symptom improvement after urethral meatotomy.

Study design

The families of boys undergoing urethral meatotomy between 2/2013 and 8/2016 received a survey by mail 6 weeks after surgery. Families were queried on changes in symptoms using a Likert-type scale (5 = much improved, 4 = somewhat improved, 3 = no change, 2 = somewhat worse, and 1 = much worse). Patient and procedure characteristics of the respondents were obtained via chart review. These included surgical indication(s) (abnormal stream, dysuria, or storage symptoms), postoperative complications, reoperation, and unplanned postoperative communications. Patients who had procedures other than simple urethral meatotomy were excluded. Descriptive statistics were compiled, and generalized estimating equations used to determine the associations of patient and procedure characteristics with symptom improvement.

Results

We sent 629 surveys and received 194 responses (30.4%). Twelve respondents were excluded for complex procedures

or miscoding. The majority of respondents were privately insured (74%) and were between 5 and 12 years old (45%) or 1 and 4 years old (42%). The most frequent surgical indication was abnormal stream (72%) followed by pain (21%) and storage symptoms (15.5%). Nine respondents had minor complications (4.9%). Four patients had restenosis requiring repeat urethral meatotomy. After surgery, a majority (79%) were "much improved," 16% were "somewhat improved," 3% had "no change," and 1% were "somewhat worse." No family reported "much worse." Those patients who had "abnormal stream" as a surgical indication were significantly more likely to report "much improved" (OR 1.83, $p = 0.014$) than those without. Patient-reported improvement was not associated with suture use, patient age, insurance, surgeon, or location of the procedure (Table).

Discussion

Little has been written about patient-reported outcomes following urethral meatotomy. Our study affirms that the majority of boys improve following this procedure. However, improvement is significantly more likely if the child has a preoperative indication of an abnormal stream, such as deflection or spraying. Boys with symptoms of dysuria, frequency, or incontinence may be experiencing sequelae of meatal stenosis that simply take longer to improve. Alternatively, the meatal stenosis may be incidental to the primary symptoms.

Conclusions

A majority of families report substantial symptomatic improvement after urethral meatotomy. However, boys undergoing urethral meatotomy for reasons other than a urinary stream abnormality are less likely to experience improvement.

Table Patient characteristics and key outcomes stratified by patient-reported improvement.

	Not "much improved" ($n = 38$)	"Much improved" ($n = 144$)	p -value
<i>Patient characteristics</i>			
Indication (n ; %)			
Stream abnormality	26/141 (18.4%)	115/141 (81.6%)	0.014*
Pain	11/41 (26.8%)	30/41 (73.2%)	0.40
Storage symptoms	6/30 (20.0%)	24/30 (80.0%)	0.90
Suture used (n ; %)	25/131 (19.1%)	106/131 (80.9%)	0.21
<i>Outcomes</i>			
Complications	5/9 (55.6%)	4/9 (44.4%)	0.02*
Reoperation	3/4 (75.0%)	1/4 (25.0%)	0.02*

* A p -value <0.05 was considered significant.

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Introduction

Meatal stenosis is a narrowing of the urethral meatus that largely occurs in circumcised boys, many of whom become symptomatic [1–3]. These symptoms may include a deflected urinary stream, spraying of urine during voiding, dysuria, or storage-related lower urinary tract symptoms (e.g. urinary frequency, urgency, nocturia, and incontinence). In a study by Cubillos et al., 15 of 20 patients with meatal stenosis undergoing uroflowmetry had either a staccato or prolonged voiding pattern [4].

Many patients with meatal stenosis will undergo urethral meatotomy [5], which entails sharply incising the stenotic skin flap covering the meatus. Following this, some surgeons will evert the urethral mucosa using interrupted tacking sutures and others will not [5–7]. Regardless of approach, the procedure is typically short and is associated with low rates of restenosis (approximately 0–1.8%) [4–7]. Although urethral meatotomy is a “minor” procedure, its high frequency in pediatric urology practice makes it a potentially impactful topic for outcome assessment.

No validated, disease-specific patient-reported outcome measures exist for urethral meatotomy, but informal assessments suggest that 13–21% of patients do not experience complete resolution of symptoms following the procedure [4,8]. As part of a quality improvement initiative within our institution, we developed a questionnaire to examine the patient experience during and after a urethral meatotomy, including patient-reported outcomes. The primary objective of this study was to evaluate rates of patient-reported improvement after urethral meatotomy, as well as variables associated with lower improvement scores. Of secondary interest was the effect of procedure technique (suture versus no suture) on clinical and patient-reported outcomes.

Methods

Survey design, sample, and administration

A postoperative urethral meatotomy survey was created for the purposes of tracking quality within our department. The initial questions were developed by content experts and subsequently revised by consensus among 11 staff urologists. The survey included nine questions. The first two questions asked for the age category of the patient (<1 year old, 1–4 years old, 5–12 years old, >13 years old) and whether or not an additional procedure was performed at the time of urethral meatotomy. Questions 3–8 used Likert-type scales, with questions 3–5 focused on communication, including how courteous the care team was, how well informed the respondent felt about the procedure, and how satisfied the patient and/or family were with postoperative instructions. Question 6 asked about pain control after surgery, and question 7 focused on postoperative symptoms compared with preoperative status (5 = much improved, 4 = somewhat improved, 3 = no change, 2 = somewhat worse, and 1 = much worse). If respondents indicated improvement they were then asked in what areas (better aim, decreased spray, less pain, stronger stream, less frequent urination or

accidents). The final question asked for comments on how to improve the experience.

All patients who underwent a urethral meatotomy at our institution between 2/1/2013 and 6/1/2016 were sent a survey via mail 6 weeks after their procedure, along with a cover letter and a stamped, addressed envelope. Survey results were returned to our quality improvement coordinator who then recorded the results into our quality improvement database. We did not provide an incentive for returning the survey. In most cases, parents or legal guardians responded, acting as proxies for their sons who underwent urethral meatotomy.

Additional variables

Patient, procedure, and outcome information was abstracted from retrospective chart review. Patient information included insurance type (private or public) and preoperative indication (abnormal stream, dysuria, and bladder storage symptoms (e.g. urinary frequency, urgency, nocturia, and incontinence)). If a uroflow study was performed preoperatively the following parameters were recorded: maximum flow rate, voided volume, post-void residual, and the shape of the flow curve; indications for a uroflow study were at the discretion of the provider. Flow curves were interpreted in a manner similar to that recommended by the International Children’s Continence Society [13]. Procedure information included where it was performed (main or satellite hospital) and whether or not sutures were used (based on operative notes). Clinical outcomes included complications and reoperations, as well as unprompted communications the family had with the Urology Department postoperatively. Patient follow-up depended on surgeon preference, with some surgeons offering “as needed” postoperative visits. Patients with no follow-up communications were classified as having no complications. An event was considered to be a complication if it deviated from the typical postoperative course following urethral meatotomy, including anything that required additional visits, phone calls, procedures, or undue distress to the family. An unprompted communication was defined as any emails, phone calls, or requests for a visit initiated by the family in the postoperative period. Procedures in patients with complex underlying conditions (e.g. prior hypospadias repair or urethral duplication) were excluded.

Surgical procedure

All urethral meatotomies were performed in the operating room under sedation or monitored anesthesia care with either EMLA cream or a local ring/penile block. One of two surgical techniques were used: urethral meatotomy alone or urethral meatotomy with suture eversion of the urethral mucosa. Techniques varied based on individual surgeon preference. Postoperatively, all patients were given bacitracin and advised to apply it liberally two to three times daily during the healing process. Instructions for the alternating use of acetaminophen and ibuprofen were given to the families. In rare instances, oxycodone was prescribed.

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