Recurrent Symptoms Following Pyeloplasty With a Normal Endoscopic Evaluation: Assessment and Outcomes of a Challenging Patient Cohort

Dominic Lee and Richard E. Link

OBJECTIVE To aid in counseling and managing a challenging patient cohort, we review our experience using a structured endoscopic approach to assess individuals with recurrent symptoms but a normal anatomic evaluation after pyeloplasty.

METHODS From 2008 to 2012, all patients presenting with recurrent symptoms after pyeloplasty for ureteropelvic junction (UPJ) obstruction were retrospectively evaluated. After baseline renal scanning, all underwent retrograde ureteropyelography, flexible ureteroscopy, UPJ balloon calibration, and provocative ureteral stenting. Patients without clear anatomic obstruction were assessed 2 weeks postoperatively at the time of stent removal and reassessed serially as outpatients before considering further operative management.

RESULTS Nineteen patients had undergone an average of 1.4 UPJ procedures: pyeloplasty in all 19, retrograde endopyelotomy in 6, and balloon dilation in 1. Mean age was 35.2 years, time from original management to symptom recurrence was 80 months, Lasix $T_{1/2}$ was 16.6 min, and differential renal function of the affected kidney was 43%. Mean follow-up after endoscopic assessment was 16.2 months. Thirteen patients (68%) achieved long-term pain-free status after endoscopic evaluation alone, and 2 (11%) were rendered symptom free after repeat robotic pyeloplasty. Of the 4 remaining patients (21%) with persistent pain after a negative endoscopic assessment, all were referred to a pain specialist. Two patients (11%) ultimately required laparoscopic nephrectomy for definitive symptom control.

CONCLUSION Our findings support evaluation with retrograde pyelography, ureteroscopy, and balloon calibration for patients with recurrent symptoms before embarking on revision pyeloplasty. Surprisingly, two-thirds of our patients achieved pain-free status with an endoscopic approach alone. UROLOGY ■: ■—■, 2014. © 2014 Elsevier Inc.

Surgical management of ureteropelvic junction obstruction (UPJO) by dismembered pyeloplasty is a rewarding endeavor with a very high success rate.[1,2] Although the definition of success varies, most are determined by (1) the resolution of clinically bothersome symptoms, (2) the maintenance of stable differential renal function, and/or (3) a normal postoperative $T_{1/2}$ Lasix washout curve on a 99mTc-MAG3 diuretic renogram.[3,4] In some cases, however, a symptomatic patient presents after pyeloplasty with an equivocal or abnormal nuclear medicine (NM) scan. Caveats remain with respect to the interpretation of these scans in the postoperative setting. Confounding factors include a "reservoir effect" from a dilated renal pelvis or failure of optimization of testing conditions, such as adequate hydration or the presence of vesicoureteral reflux. These factors can result in a prolonged Lasix $T_{1/2}$ washout time that does not reflect true recurrent UPJO. Unfortunately, there is little published literature on the assessment and outcomes for this rare but complex subset of patients. Their uncertainty in status can amplify both patient and physician frustration and complicate subsequent management decisions.

To better understand this difficult patient cohort, here we report our evaluation strategy and outcomes for symptomatic patients presenting to a tertiary referral center after definitive surgical management for UPJO.

MATERIALS AND METHODS

Our institutional review board approved data collection and database use. We performed 141 laparoscopic or robotic pyeloplasty procedures at our tertiary referral center between July 2005 and December 2012. We retrospectively reviewed records of patients referred to our center during that time period with

Financial Disclosure: *The authors declare that they have no relevant interests.*

From the Scott Department of Urology, Baylor College of Medicine, Houston, TX

Reprint requests: Richard E. Link, M.D., Ph.D., Scott Department of Urology, Baylor College of Medicine, McNair Medical Campus, 7200 Cambridge, 10th floor, Urology Suite B, Houston, TX 77030. E-mail: link@bcm.edu

Submitted: January 14, 2014, accepted (with revisions): March 8, 2014

0090-4295/14/$36.00
http://dx.doi.org/10.1016/j.urology.2014.03.010

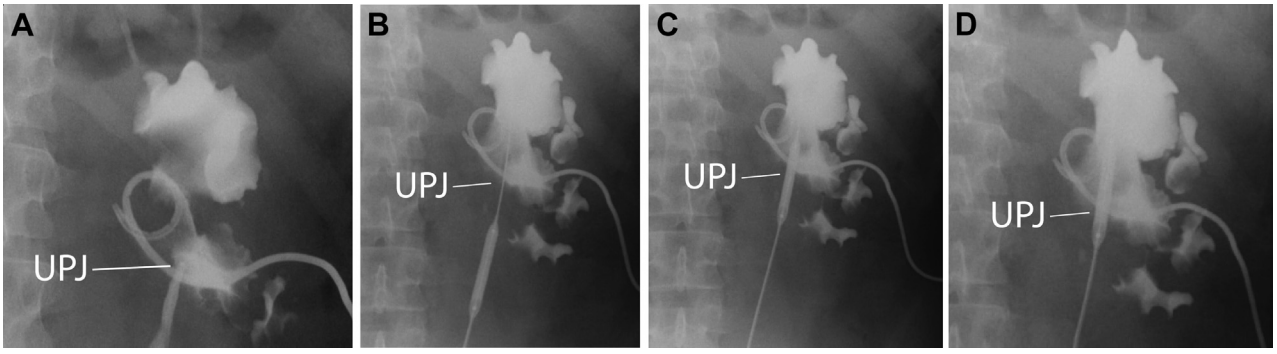

Figure 1. Example sequence of a negative endoscopic evaluation and balloon calibration. **(A)** Magnified view of the ureteropelvic junction (UPJ) on retrograde ureteropyelogram; **(B)** 18F catheter balloon inflated without a waist well below the UPJ under fluoroscopic monitoring; **(C, D)** An 18F catheter ureteral dilating balloon passes without resistance across the UPJ while inflated.

recurrent clinical symptoms after definitive surgical management for UPJO. All patients were evaluated with a thorough clinical history and a complete physical examination and urinalysis to exclude urinary tract infection. All patients had baseline NM renal scanning to assess the differential function of affected renal units at the time of presentation. A standard 99mTc-MAG3 (mercaptoacetyltriglycine) diuretic renal scan with intravenous Lasix 40 mg injected at 20 minutes (F+20) was performed. All images were reviewed and verified by the treating team.

Patients with a possible diagnosis of secondary UPJO underwent a complete endoscopic evaluation under general anesthesia with cystoscopy, retrograde ureteropyelography, diagnostic flexible ureteroscopy 8.5F catheter, UPJ calibration with an 18 French ureteral dilating catheter (Cook Medical Inc., Bloomington, IL) inflated to 14 atm of pressure. Balloon calibration entailed inflating the balloon below the anatomic UPJ under fluoroscopic monitoring and then passing the balloon into the renal pelvis although inflated without significant resistance. Intraoperative findings of stricture, filling defects, or a waist at the UPJ during balloon inflation were recorded. Patients whose endoscopic evaluation confirmed significant anatomic narrowing at the UPJ with dense scar tissue were subsequently treated either with retrograde endopyelotomy or redo pyeloplasty. This larger group of patients is not reported in the present study, which focuses specifically on patients lacking clear anatomic evidence by retrograde ureteropyelography or URS for anatomic obstruction. These patients underwent provocative stenting with placement of a 6F catheter double pigtail stent placed over a wire. They were assessed at 2 weeks postoperatively for symptom status with the stent in place and then underwent stent removal in the office. Patients were subsequently assessed for resolution or recurrence of pain complaints. Our strict definition of recurrent UPJ obstruction included (1) radiographic evidence of narrowing at the UPJ before dilation, (2) resolution of symptoms with provocative stenting and (3) symptom recurrence after stent removal. Patients who met these criteria were offered revision surgery with robotic-assisted laparoscopic dismembered pyeloplasty. Patients who did not experience pain relief with stenting were offered referral to a pain specialist. All remaining patients were simply followed serially in the outpatient setting.

Descriptive statistics was used to characterize demographic data. Independent *t* testing was used to detect differences in functional outcomes between the surgical groups with criterion set at $P < .05$ for statistical significance. SPSS version 16 (Chicago, IL) was used for all statistical analysis.

RESULTS

We identified 19 symptomatic patients with potential secondary UPJO who underwent a negative endoscopic evaluation, including balloon calibration (Fig. 1). These patients had undergone an average of 1.4 UPJO procedures (range, 1-4) including pyeloplasty in all 19 (open, 10; robotic, 8; and laparoscopic, 1), retrograde cutting balloon endopyelotomy in 6, and retrograde balloon dilation before pyeloplasty in 1. The mean age of our cohort was 35.2 years (range, 18-62 years) with mean follow-up of 16.2 months (range, 3-41 months). Mean time from original UPJO management to symptom recurrence was 80 months (range, 2-453 months). The mean Lasix $T_{1/2}$ and differential renal function on NM renal scan was 16.6 minutes (range, 9-31 minutes) and 43% (range, 24%-100%), respectively (Table 1). There were 5 patients who had $T_{1/2}$ >20 minutes.

Of the 19 patients, 13 (68%) achieved pain-free status after endoscopic evaluation alone and 2 (11%) were rendered symptom free after repeat robotic dismembered pyeloplasty. Of the 4 patients (21%) with persistent pain after a negative endoscopic assessment, all were referred to a pain specialist. Two patients (11%) ultimately required simple laparoscopic nephrectomy for definitive symptom control. For these 2 patients, the differential renal function of the affected renal unit was 25% and 38%, and the $T_{1/2}$ Lasix washout time was 22 and 20 minutes, respectively. Both patients had preoperative hydronephrosis and 1 had a negative Whitaker test (pressure gradient <20 cm H_20). Both patients did not have resolution of their pain with provocative stenting, and both were rendered pain free after simple nephrectomy. The diagnostic evaluation and outcomes for all patients is summarized in Figure 2.

COMMENT

When evaluating patients for clinically significant UPJO, the clinician must integrate a mixture of clinical symptoms and imaging findings. The challenge involved in assessment is even greater in the setting of secondary UPJO