



Reoperative robotic pyeloplasty in children

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Summary

Introduction

Reoperative pyeloplasty for recurrent ureteropelvic junction obstruction (UPJO) can be technically challenging and is associated with greater morbidity and lower success rates than an initial repair. Robotic-assisted laparoscopic pyeloplasty (RALP) previously has been demonstrated to be a safe and effective approach for management of recurrent UPJO; however, the length of follow-up has been limited. The objective of this study was to confirm the safety and efficacy of RALP for UPJO in children following failed previous pyeloplasty and provide clinical benchmarks for intermediate length follow-up in this patient population.

Methods

An IRB approved retrospective chart review was performed for all patients undergoing reoperative RALP from June 2006 to December 2014. All cases were performed by surgeons from two institutions for persistent UPJO following failed initial pyeloplasty. Information including demographic information, radiographic studies, and operative interventions performed between the initial repair and reoperative surgery, reoperative RALP intraoperative data, postoperative clinical course and imaging studies, and subsequent interventions following reoperative RALP were extracted.

Results

Twenty-three children underwent reoperative RALP. Eleven patients had right- and 12 left-sided

repairs. Median age at reoperative RALP was 4.0 years and median interval between surgeries was 1.3 years. Indications for repeat repair included pain, infection, and/or radiographic evidence of worsening obstruction and/or deteriorating renal function. Mean operative time was 198 min from incision to port closure. Mean length of stay was 2.3 days. Six complications occurred in five patients within 30 days postoperatively, including ileus, pneumonia, and urinary tract infection. Median length of follow-up was 26 months (range 4–45 months) for all patients and 31 months (range 16–45 months) in 18 patients with >12 months of follow-up. More than 80% of patients presenting with flank pain prior to reoperative RALP had resolution of this symptom. To date, 78% of patients with >12 months of follow-up have not required further operative intervention. Excellent results have been achieved in 14 of 18 patients (78%) with sufficient postoperative follow-up in terms of length of follow-up (>12 months), symptom resolution, and/or improved imaging results.

Conclusions

RALP following previous pyeloplasty is technically feasible with acceptable operative times, lengths of stay, and complication rates. Reoperative RALP is our preferred modality for repair of recurrent UPJO with the vast majority of patients having successful outcomes based on imaging, resolution of symptoms, and the rare need for further intervention across an intermediate length follow-up period.

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Keywords

Hydronephrosis; Ureteropelvic junction obstruction; Robotic surgery; Laparoscopy

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Table Summary of reoperative pyeloplasty experience in 23 patients.

Median age (years) at Redo Surgery (Range)	4.0 (14 months–19 years)
Median time (years) between Primary and Redo Surgery (Range)	1.3 (4 months–17 years)
Reconstructive technique utilized	
Anderson-Hynes Dismembered	20
Y–V plasty	1
Lower-to-upper pole moiety pyeloureterostomy	2
Retrograde ureteral stent placement/exchange ^a	13
Antegrade ureteral stent placement	10 (1 nephroureteral stent utilized)
Conversion to open technique	0
Mean length of stay	2.3 days (1.1–4.4 days)
Outcome^b	
<i>Median length of follow up: 26 months (range 4–45 months)</i>	
Improved (%)	19 (83%)
Stable (%)	3 (13%)
Worse (%)	1 (4%)
Outcome^b in patients with > 12 months follow-up (N = 18)	
<i>Median length of follow up: 31 months (range 16–45 months)</i>	
Improved (%)	14 (78%)
Stable (%)	3 (17%)
Worse (%)	1 (5%)

See text for further details.

^a 1 patient had nephrostomy tube placed at presentation (pyelonephritis) and a retrograde stent placed at the time of surgery.

^b Criteria: Resolution of symptoms and/or improvement on imaging.

Introduction

Pyeloplasty is performed via an open, laparoscopic, or robotic-assisted approach for the initial correction of UPJO in children. While the initial surgery for treatment of UPJO is highly effective with success rates surpassing 90%, failure of initial pyeloplasty can necessitate reoperative surgery [1].

Previous series have reported outcomes following open and laparoscopic reoperative pyeloplasty for recurrent UPJO in children [2–4]. Passerotti et al. described the surgical technique and feasibility of utilizing robotic-assistance for laparoscopic reoperative pyeloplasty in six children; however, detailed operative information and follow-up data were not included [5]. Hemal et al. and Lindgren et al. reported on reoperative RALP in 9 and 13 children, respectively [6,7]. These reports demonstrated the feasibility of this technique with early results. Here we review our series of 23 pediatric patients to confirm the safety and efficacy of a robotic-assisted laparoscopic approach for recurrent UPJO and to provide initial benchmarks for intermediate follow-up in this patient population.

Methods

Data acquisition

After institutional review board approval, a retrospective review was undertaken for all patients undergoing reoperative RALP at two institutions from June 2006 to December 2014. One patient undergoing ureterocalycostomy was excluded. Indications for repeat repair included clinical symptoms, radiographic findings of obstruction, and/or

worsening renal function. Open reoperative pyeloplasty was not performed during this time.

We recorded demographic information, radiographic studies, operative interventions performed between the initial repair and reoperative surgery, reoperative RALP intraoperative data, postoperative clinical course and imaging studies, and subsequent interventions following reoperative RALP.

Technique

The technique for RALP has been described previously, and reoperative RALP was performed in a similar fashion with few modifications [5,8,9].

Briefly, cystoscopy and retrograde pyelography was performed prior to reconstruction, usually in the same setting, and a double J stent was placed retrograde in some patients, while in others the stent was placed antegrade during the procedure. Intraoperatively, it is our experience that mobilization of the ureter and pelvis is often best facilitated by initial identification of the ureter and subsequent dissection proximally. When extensive peripelvic fibrosis was encountered, an anterior Y–V advancement of the pelvic tissue across the stenotic UPJ was performed. No abdominal drains were placed. A urethral catheter was left in place until the next morning. Patients were discharged when voiding comfortably, self-hydrating, and comfortable on oral analgesics. All patients were placed on prophylactic antibiotics until follow-up imaging.

Postoperatively, patients were evaluated clinically via serial renal ultrasound studies for symptoms concerning for recurrent UPJO. Renography was generally performed only in instances with poor initial renal function, or if symptoms and/or hydronephrosis did not improve following surgery.

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