Ileal Ureter Replacement for Complex Ureteral Reconstruction Has a High Success Rate at 3 Year Follow Up

Bryn Launer MD¹, David Koslov MD, Kirk Redger MD, Anessa Sax-Bolder* BA, Ty Higuchi MD PhD, Brian J Flynn MD

1, University of Colorado School of Medicine, Aurora, CO.
2, Division of Urology, University of Colorado Denver School of Medicine, Aurora, Colorado

**PURPOSE**

- Complex or lengthy ureteral strictures may require ileal ureter interposition, which remains an important option for ureteral reconstruction.
- Reported long term success rate is 75-85%.
- We report on our 16 year institutional experience with ileal ureter interposition.

**MATERIALS AND METHODS**

- Retrospective review of a single institution’s ureteral reconstruction database was performed (2003-2019).
- Three urologic surgeries performed all surgeries.
- Unilateral replacements utilized ureteral interposition when possible. Bilateral ileal ureters were performed using the “reverse 7” approach.
- Preoperative patient demographics, ureteral stricture characteristics, intraoperative variables, complications, and secondary procedures were recorded.
- Success rate was defined as no need for further intervention.

**RESULTS**

- Between 2003 and 2019, 188 ureteral reconstructions were performed, of which 46 required ileal ureter interposition (10 bilateral).
- Average age = 53 years, 44% male, 96% Caucasian, 11% Hispanic/Latino.
- Stricture etiology: iatrogenic causes (n=24, 52%), radiation (n=12; 26%), vascular disease (n=3; 7%), idiopathic retroperitoneal fibrosis (n=3; 7%), and other causes including congenital and trauma (n=4; 9%).
- Half (n=23) received prior intervention, all required prior stent or PCN.
- 23 patients (50%) had any complication (Clavien Dindo 1–5)
- 11 (24%) patients had a major (Clavien Dindo 3a or greater) complication
- At avg. of 3.3 year follow up 8 (17%) patients required additional open procedures
- Of those 8:
  - 3 ultimately required nephrectomy due to persistent pain or pyelonephritis
  - 5 underwent successful revision of the ileal ureter

**CONCLUSIONS**

- In our long-term follow up of over 3 years, ileal ureter interposition is a successful option for complex ureteral strictures in properly selected patients.
- Utilization of the “Care Everywhere” function in Epic allows for acquisition of additional follow-up data from patients followed out-of-state.
- Limitations of this series include biases associated with retrospective conclusions drawn from a single-center institution. Additionally, the length of follow up varies due to the nature of referrals to a tertiary academic center.
- Alternatives to ileal ureteral interposition for complex ureteral strictures include autotransplantation and lower ureteral reconstruction.
- In this single-institution retrospective cohort, long-term outcomes at 4 years are comparable to the existing literature, with an 83% success rate in which no further open procedures are required.

**REFERENCES**


**Acknowledgements & Disclosures**

Financial Disclosures: None
Acknowledgements: The authors would like to thank the house staff at UCH for their efforts in contributing to this study.

For questions or the full EndNote bibliography: Anessa.sax-bolder@cuanschutz.edu

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**Table 1. Contemporary Series of Ileal Ureteral Interposition**

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Description</th>
<th>% Bilateral</th>
<th>% Complications</th>
<th>Average % months</th>
<th>% Success Rate</th>
<th>Definition of Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moser et al., 2018</td>
<td>Radiation cases</td>
<td>10.2</td>
<td>29.8</td>
<td>9.2</td>
<td>80/180</td>
<td>98% Anastomotic stricture</td>
</tr>
<tr>
<td>Stahl et al., 2009</td>
<td>Laparoscopic v. Open</td>
<td>15.3</td>
<td>31.7</td>
<td>30</td>
<td>14/16</td>
<td>100% Anastomotic stricture</td>
</tr>
<tr>
<td>Chang et al., 2006</td>
<td>Long-term fu</td>
<td>5.5</td>
<td>25.7</td>
<td>14/16</td>
<td>56/75</td>
<td>98% Anastomotic stricture</td>
</tr>
<tr>
<td>Maritaga et al., 2003</td>
<td>Contemporary series</td>
<td>11.1</td>
<td>16.6</td>
<td>16.6</td>
<td>19/18</td>
<td>100% Anastomotic stricture</td>
</tr>
<tr>
<td>Shokri et al., 1995</td>
<td>Modified ileal ureter</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4/5</td>
<td>100% Ureteral obstruction</td>
</tr>
<tr>
<td>Borcherding et al., 1979</td>
<td>UCLA Series</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7/10</td>
<td>100% Anastomotic failure</td>
</tr>
</tbody>
</table>

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**Fig 1. Armatys and Bihrle: J Urol 2009**

**Fig 2a. Nephrostogram with PNC in place.**

**Fig 2b. Nephrostogram with PNC in place.**

**Fig 3. Intraoperative photo of 5cm defect after excision.**

**Fig 4. Intraoperative photo of 8cm ileal ureter.**

**Table 2. Per-operative and long-term outcomes after ileal ureter interposition**

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Radiated (n=19)</th>
<th>Non-Radiated (n=27)</th>
<th>Total (n=46)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of Stricture (cm)</td>
<td>11.22</td>
<td>7.77</td>
<td>9.13</td>
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<tr>
<td>Length of Operation (min)</td>
<td>452</td>
<td>372</td>
<td>412</td>
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<tr>
<td>Estimated Blood Loss (mL)</td>
<td>561</td>
<td>255</td>
<td>417</td>
</tr>
<tr>
<td>Length of Stay (days)</td>
<td>13.5</td>
<td>7.52</td>
<td>10</td>
</tr>
<tr>
<td>Successful outcome</td>
<td>89% (17)</td>
<td>78% (21)</td>
<td>83% (38)</td>
</tr>
</tbody>
</table>