Management of ureteral complications in renal transplant: Endoscopic vs. Surgical

Endoscopy

July 4, 2018, FOIU
David A. Goldfarb, MD
Professor of Surgery, CCLCM
Glickman Urologic and Kidney Institute
Cleveland Clinic, Ohio, USA
FOIU 2018 - Disclosures

• No financial disclosures
Urological Complications

- Stricture – 2-5%
- Leak – 2-5%
- VUR – 40%
- BOO – 1.2%

*Compromised distal blood supply following donor procurement is responsible for most non-technical ureteral strictures*
Initial Evaluation

Hydronephrosis + No other cause

Urinary Tract Decompression

Allograft Dysfunction

Ultrasound

Hydronephrosis

Renal vessel patency

Peri-nephric collection

↑Creatinine

√Drug level

√US

√Renal biopsy

1. Percutaneous Nephrostomy
2. Antegrade Nephrostogram
3. Stent
Definitive Management of Transplant Ureteral Strictures / Leaks: Considerations

- **Timing**
  - Early
  - Late

- **Location**
  - Distal, Mid, Proximal

- **Length**
  - <2cm*
  - >2cm*

+ Clinical Impact
Endourological Techniques

• Stenting
• Balloon dilation
• Direct vision ureterotomy
  - Cold knife, electrocautery, Holmium laser
• Accusize
Studies of Endourologic Management of Transplant Ureteral Complications

Limitations

- Small, heterogeneous case studies
- Variable follow-up
- Variable definition for success
Contemporary Endourological Outcomes  
*Mano et al, Urology, 80: 255, 2012*

<p>| Table 2. Results of recent series of ureteral strictures in kidney transplant patients treated by percutaneous balloon dilation or endoureterotomy |</p>
<table>
<thead>
<tr>
<th>Series</th>
<th>Patients (n)*</th>
<th>Treatment Modality</th>
<th>Success Rate (%)</th>
<th>Follow-Up (mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachar et al,7</td>
<td>21</td>
<td>PBD</td>
<td>62†</td>
<td>20 (mean)</td>
</tr>
<tr>
<td>Bromwich et al, 8</td>
<td>9</td>
<td>PBD</td>
<td>44†</td>
<td>17 (mean)</td>
</tr>
<tr>
<td>Aytekin et al,9</td>
<td>19</td>
<td>PBD</td>
<td>58</td>
<td>34 (mean)</td>
</tr>
<tr>
<td>Juaneda et al,10</td>
<td>45/56</td>
<td>PBD</td>
<td>45</td>
<td>78 (mean)</td>
</tr>
<tr>
<td>PBD mean success rate</td>
<td></td>
<td></td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Schwartz et al,11</td>
<td>6</td>
<td>Balloon cautery</td>
<td>83†</td>
<td>27 (mean)</td>
</tr>
<tr>
<td>Seseke et al,12</td>
<td>5</td>
<td>Balloon cautery</td>
<td>60</td>
<td>14 (mean)</td>
</tr>
<tr>
<td>Bhayani et al,13</td>
<td>3/8</td>
<td>Balloon cautery</td>
<td>67</td>
<td>20 (mean)</td>
</tr>
<tr>
<td>Kristo et al,14</td>
<td>3/9</td>
<td>Holmium:YAG laser plus balloon dilation</td>
<td>100</td>
<td>24 (median)</td>
</tr>
<tr>
<td>Gdor et al,15</td>
<td>6/9</td>
<td>Holmium:YAG laser plus balloon dilation</td>
<td>67</td>
<td>58 (mean)</td>
</tr>
<tr>
<td>He et al,16</td>
<td>8</td>
<td>Holmium:YAG laser (n = 4)</td>
<td>63</td>
<td>16 (mean)</td>
</tr>
<tr>
<td>Electrocautery (n = 4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Katz et al,17</td>
<td>14</td>
<td>Electrocautery (retrograde)</td>
<td>93</td>
<td>8 (mean)</td>
</tr>
<tr>
<td>Conrad et al,18</td>
<td>11</td>
<td>Cold-knife</td>
<td>82</td>
<td>26 (mean)</td>
</tr>
<tr>
<td>Present series</td>
<td>12</td>
<td>Cold-knife (n = 9)</td>
<td>83</td>
<td>44 (median)</td>
</tr>
<tr>
<td>Holmium:YAG laser (n = 2) Electrocautery (1) (retrograde with balloon dilation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endoureterotomy mean success rate</td>
<td></td>
<td></td>
<td>79</td>
<td></td>
</tr>
</tbody>
</table>

PBD, percutaneous balloon dilation; YAG, yttrium-aluminum-garnet.
*In series with multiple treatment options, number of patients treated by endoureterotomy/total number of patients in study noted.
†Success rate after single procedure lower than stated, several patients required multiple treatments.
Transplant Stents
Can they prevent urologic complications?

- Wilson et al, Cochrane Database, 2013
- Stents reduce ureteral obstruction / leak (RR = 0.24)
- Caveat: Influence of surgeon experience (RR=0.39)
- Stents associated with UTI (RR= 1.49), mitigated with cotrimazole (RR= 0.97)
- Stent complications: irritative symptoms, breakage, encrustation, migration, forgotten stent
- Longer stent (≥ 20cm), longer duration (≥ 6 weeks)
Stents: Pragmatic Recommendations

*Risks vs. Benefits*

- Validate practices locally as a QAPI issue
- With normal bladder and ureter – surgeon’s choice (experience/results)
- Real value is when one of these is abnormal
Endourologic Management of Transplant Ureteral Stricture

42 yo, LD, ureteral stent
Stent out 4wks, creat 1.8
6 wks creat 2.9
US hydro, CT pelvic fluid
Drain placed, no recovery
Perc tube placed
Cystogram to evaluate bladder leak
Creat 2.03
Endourologic Management of Transplant Ureteral Stricture

8F nephroureteral
12F nephroureteral
6 weeks total

Nephroureteral pulled
Nephrostomy only for
3 weeks
Creat stable

Nephrostomy pulled
Creat 1.4 – 1.6 mg/dl
Urine Leak - Importance of bladder management

- 52 yo, Alports, PD for 5 years
- Prostate ca (T1c), Rx brachytherapy, LUTS
- DD transplant, short ureter, uretero-ureterostomy
- Foley out at 7 days, Increased drainage day 14 (800cc)
- Drain creat 32 mg/dl, foley placed, stent position confirmed, drain stopped overnight
- Foley for 4 weeks. Removed, required CIC
- Febrile UTI, hospital admit
- Stent removed at 2 mos, creat now 1.68, stable on CIC