The Utility of Radiologic and Symptomatic Surveillance After Pyeloplasty

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Background

• Overall Incidence of UPJO: 1 in 1,500

• The treatment of choice for UPJO is minimally-invasive pyeloplasty ➔ high success rates, low complication

• Combination of symptom assessment and imaging are used to assess for obstruction after pyeloplasty
Problem

- No standard definition of success
  - Relief of Symptoms
  - Absence or reduction of obstruction on imaging
  - No indication for secondary procedure
- No guidelines for radiologic surveillance schedule
- Lack of evidence supporting the utility of post-operative imaging to detect asymptomatic obstruction
Study Aim

Stratify post-op patients into groups based on
1) Radiologic Imaging
2) Symptoms

and evaluate the risk of pyeloplasty failure in each group.
Questions

• Is initial post-op imaging useful to guide surveillance?
• What is the pattern of failure based on initial post-operative imaging?
• How should we follow patients?
Methods

• Single center; retrospective review
• All primary minimally invasive pyeloplasties (1996-2019)
  – 18+
  – Postoperative imaging available
• Patients grouped into 3 cohorts after pyeloplasty and ureteral stent removal

1° Outcome: Procedural Failure
2° Outcomes: Radiologic and Symptomatic Failure
Methods: Groups by Initial Radiologic Imaging

NORMAL
• T1/2 ≤ 20
• Mild or improved hydronephrosis

EQUIVOCAL
• T1/2 > 20 but improved
• Moderate or unchanged hydronephrosis

OBSTRUCTED
• T1/2 > 20
• Severe or worsening hydronephrosis
### Methods: Groups by Symptoms

<table>
<thead>
<tr>
<th>Asymptomatic</th>
<th>Symptomatic, Non-severe</th>
<th>Symptomatic, Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>No flank pain at any point after stent removal</td>
<td>Flank pain reported at any point after stent removal and not meeting Symptomatic, Severe criteria</td>
<td>• Flank Pain severity 8-10 OR</td>
</tr>
<tr>
<td></td>
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<td>• Flank pain reported as similar to/worse than pain prior to surgery OR</td>
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<td></td>
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<td>• Flank pain requiring clinic or emergency room visit OR</td>
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<td>• Flank pain reported to interfere with daily activities</td>
</tr>
</tbody>
</table>
Results

299 Patients
Age 41.7 (17.2)

Male
Female
59%

Procedure Type

Lap
Robotic
72%

Initial Image Type

DRS
CT
US
Other
91%
Results: Initial Imaging

- Unobstructed: 226 (76%)
- Equivocal: 30 (10%)
- Obstructed: 43 (14%)
Results: Failure Based on Initial Imaging

- Procedural Failure (%): 35% normalized on future imaging
- Symptomatic Failure (%): 13%
- Radiologic Failure (%): 4%
- Obstructed: 49%

p < 0.001
## Rates of Procedural Failure by Imaging + Symptoms

<table>
<thead>
<tr>
<th></th>
<th>Normal (n=226)</th>
<th>Equivocal (n=30)</th>
<th>Obstructed (n=43)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asymptomatic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=181)</td>
<td>0.6% (n=151)</td>
<td>6% (n=16)</td>
<td>14% (n=14)</td>
</tr>
<tr>
<td><strong>Non-Severe Symptoms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=55)</td>
<td>3% (n=36)</td>
<td>17% (n=6)</td>
<td>46% (n=13)</td>
</tr>
<tr>
<td><strong>Severe Symptoms</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n=63)</td>
<td>18% (n=39)</td>
<td>25% (n=8)</td>
<td>81% (n=16)</td>
</tr>
</tbody>
</table>
When will failure occur?
In all but 3 cases, procedural failure occurred within the first 2 years.
Time to Procedural Failure: Symptoms

b. Need for Additional Procedure Based on Symptoms

Symptom category
- Asymptomatic
- Non-severe
- Severe

Follow-up Time (wks)

Post-operative course without additional procedure

$p < 0.001$
Conclusions

• Recurrent obstruction rates varied depending on outcome of initial radiologic study
  – Initial imaging helps guide management

• Risk of failure is very low in asymptomatic patients with normal initial imaging
  – The utility of routine radiologic surveillance in these patients may be low

• Failure unlikely to occur after 2 years unless severely symptomatic or normal initial radiological imaging