Surgical outcomes are equivalent after pure laparoscopic and robotic-assisted pyeloplasty for ureteropelvic junction obstruction

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Background

![Bar chart showing the number and proportion of open, laparoscopic, and robotic pediatric pyeloplasties performed in the U.S. between 2003 and 2015 (n = 11,899).](image)

*Figure 1*

Number and proportion of open, laparoscopic, and robotic pediatric pyeloplasties performed in the U.S. between 2003 and 2015 (n = 11,899).

Varda et al., *J Pediatr Urol*, 2018
Background

• Question posed to one of our faculty: “Am I giving my patients substandard care since I am not doing robot-assisted pyeloplasty?”

• Objective of study: compare outcomes between pure laparoscopic and robotic-assisted pyeloplasty
Methods

- Single center, retrospective review
- All patients who underwent pure lap or robot-assisted pyeloplasty between 2013-2018
- Exclusions: redo cases, incomplete follow up information
- Data collected
  - Demographics
  - Operative time
  - Length of hospital stay
  - Complication rates
“Operative time”

• Defined as procedure start to procedure finish
  • Including:
    • Retrogrades
    • Docking
    • Repositioning
    • Etc.
Results

• 313 patients underwent lap/robot pyeloplasty
  • 79 excluded
• Study population: 234 patients
  • 119 robotic cases
  • 115 lap cases
• Mean overall follow-up: 20.8 months
## Results

|                  | Robotic  
n=119          | Laparoscopic  
n=115        | p value |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Mean age (years)</strong></td>
<td>6.8 (STD 5.2)</td>
<td>6.2 (STD 5.4)</td>
<td>p=0.35</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>83 (69.7%)</td>
<td>80 (69.6%)</td>
<td>p=0.98</td>
</tr>
<tr>
<td>Female</td>
<td>36 (30.3%)</td>
<td>35 (30.4%)</td>
<td></td>
</tr>
<tr>
<td><strong>Laterality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>83 (69.7%)</td>
<td>74 (64.3%)</td>
<td>p=0.38</td>
</tr>
<tr>
<td>Right</td>
<td>36 (30.3%)</td>
<td>41 (35.7%)</td>
<td></td>
</tr>
<tr>
<td><strong>Accessory vessel present</strong></td>
<td>49 (41.2%)</td>
<td>43 (37.4%)</td>
<td>p=0.55</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th></th>
<th>Robotic  ( n=119 )</th>
<th>Laparoscopic  ( n=115 )</th>
<th>( p ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean operative time (hours)</strong></td>
<td>3.75 (STD 1.41)</td>
<td>3.12 (STD 0.66)</td>
<td>( p&lt;0.001 )</td>
</tr>
<tr>
<td><strong>Mean length of stay (days)</strong></td>
<td>1.22 (STD 0.87)</td>
<td>1.50 (STD 1.61)</td>
<td>( p=0.095 )</td>
</tr>
<tr>
<td><strong>Adverse events</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>36 (30.2%)</td>
<td>29 (25.2%)</td>
<td>( p=0.39 )</td>
</tr>
<tr>
<td>Infectious</td>
<td>13 (10.9%)</td>
<td>14 (12.2%)</td>
<td>( p=0.77 )</td>
</tr>
<tr>
<td>Secondary procedure</td>
<td>13 (10.9%)</td>
<td>11 (9.6%)</td>
<td>( p=0.73 )</td>
</tr>
</tbody>
</table>
Results

• Secondary procedures
  • Urine leak requiring nephrostomy tube
    • Lap = 3 patients (one went on to develop obstruction)
    • Robot = 0 patients
  • Procedures for secondary obstruction
    • Lap = 4 endoscopic management, 4 redo pyeloplasty
    • Robotic = 4 endoscopic management, 4 redo pyeloplasty
  • Other secondary procedures not related to obstruction or leak
    • Lap = 1 patient
    • Robot = 5 patients

• Total: lap = 11, robotic = 13 (p=0.73)
Multiple weaknesses

• Operative time definition
• Differences in surgeon experience
• Differences in technique
  • Lap:
    • Some had US guided antegrade nephrostomy tubes placed
  • Robot:
    • HIDES vs more standard port placement
Conclusions

• There is no difference in outcomes between robotic and pure laparoscopic pyeloplasty
  • Differences in operative time were statistically significant but not likely clinically meaningful

• Surgeons performing laparoscopic and robotic pyeloplasty are offering the same level of care for surgical management of UPJ obstruction