Extended Experience with High Submuscular Placement of Inflatable Penile Prosthesis Reservoirs
Mehraban Kavoussi, Adam Baumgarten, Nicolas Ortiz, Ellen Ward, Allen Morey
University of Texas Southwestern Medical Center, Dallas, Texas

INTRODUCTION
• High submuscular (HSM) placement of inflatable penile prosthesis (IPP) reservoirs is a new method of reservoir placement FDA approved in 2015
• Since 2010 we have performed HSM placement of IPP reservoirs almost exclusively at our tertiary center
• In 2014 we proposed a refined, 5-step HSM reservoir placement technique during penoscrotal IPP

OBJECTIVE
• To present a comparison of complication rates over a ten-year period between reservoir placement in HSM versus Space of Retzius (SOR) location
• To describe and evaluate our current HSM technique

METHODS
• Retrospective review
• Single surgeon series
• 549 virgin implants performed between 2009 and 2019
  – SOR vs. HSM compared
  – HSM cases stratified into Initial Era (2010-2014) or Current Era (2014-2019)
• Reservoir related complications compared between HSM and SOR groups as well as Current Era vs. Initial Era sub-groups
• Statistical analysis
  – Continuous variables were compared with Mann-Whitney U test
  – Categorical variables were compared using Fisher’s exact test
  – Significance was defined as p<0.05

Complications: HSM vs. SOR Comparison

<table>
<thead>
<tr>
<th></th>
<th>HSM (n=430)</th>
<th>SOR (n=131)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative complications</td>
<td>9</td>
<td>2.1%</td>
<td>6</td>
</tr>
<tr>
<td>Major Complications</td>
<td>1</td>
<td>0.2%</td>
<td>3</td>
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</tbody>
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Complications: Current Era vs. Initial Era*

<table>
<thead>
<tr>
<th></th>
<th>HSM (n=133)</th>
<th>SOR (n=297)</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative complications</td>
<td>6</td>
<td>4.5%</td>
<td>3</td>
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<tr>
<td>Major Complications</td>
<td>1</td>
<td>0.8%</td>
<td>0</td>
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</tbody>
</table>


High Submuscular IPP Reservoir

MAJOR COMPLICATIONS
Space of Retzius: 3/131 (2.29%)
• Erosion of reservoir into the bladder (1)
• Pelvic vascular complications (2)
High Submuscular: 1/418 (0.24%), all in initial era
• Reservoir herniation into peritoneal space causing bowel obstruction (1)

REFINED 5-STEP SURGICAL TECHNIQUE FOR HSM PLACEMENT
1. Position and Access: In a Trendelenburg position, the selected inguinal ring is accessed via penoscrotal incision
2. Lower HSM Pocket: The lower HSM pocket is developed digitally
3. Upper HSM Pocket: The cephalad portion of HSM pocket is developed by a Forster lung grasping clamp
4. Reservoir Delivery: Reservoir is delivered into the HSM space, overfilled and manually compressed (fill and fine-tune)
5. Confirm and Connect: After the volume and position are confirmed, the reservoir is connected to the device

CONCLUSIONS
• Our extended experience validates the HSM placement of IPP reservoirs is a safe alternative to traditional SOR placement
• Major reservoir complications have been minimized after implementation of our current 5-step technique