Robotic surgery in Gynecologic Oncology

Kellie Rath, MD, FACOG
Ohio Health Gynecologic Cancer Surgeons
About me…

- Gynecologic oncology fellowship at OSU – finished 6/2013
- Board certified in OB/GYN and Gynecologic Oncology
- >200 robotic cases in fellowship
- Started at Ohio Health 8/2013
  - >300 robotic cases since starting solo practice.
And about our practice…

• Ohio Health Gynecologic Cancer Surgeons
  – Gary Reid
  – Kellie Rath
  – Aine Clements
• All fellowship trained gynecologic oncologists
• All offer minimally invasive surgery
  – Robotics
  – Laparoscopy
What we do….

- Treatment (surgical and chemotherapy) of gynecologic cancers
  - Uterine
  - Ovarian
  - Cervical
  - Vaginal
  - Vulvar

- Management of complex pelvic masses concerning for cancer

- Management of complicated pre-invasive disease of cervix, vaginal, vulva

- Complex gynecologic cases
Robotic surgery in gynecologic oncology

"Hi, I’ll be performing your surgery tomorrow."
HOW WE USE ROBOTICS IN OUR PRACTICE....
Pelvic mass

- Both laparoscopy and robotics are used when minimally invasive surgery is appropriate
- Benefit of robotics is providing a full staging via minimally invasive surgery
- Masses up to 20 cm may be appropriate for minimally invasive approach
Endometrial Cancer

- Useful for almost all endometrial cancer surgeries
  - High BMI
  - Cervical involvement
  - Bulky pelvic lymph nodes

- May be limited in:
  - Bulky high para-aortic lymph nodes
  - Peritoneal spread
Ovarian Cancer

• Robotics are useful for:
  – Early Stage disease
  – Recurrent disease (isolated to spleen or other solitary lesion)

• Not useful in debulking of upfront advanced disease
Cervical Cancer

- Radical hysterectomy
- Lymph node dissection for treatment planning
- Ovarian transposition prior to radiation therapy

- Limited: recurrent disease requiring pelvic exenteration
BENEFITS TO ROBOTICS IN GYNECOLOGIC ONCOLOGY...
Potential Patient Benefits & Risks

*da Vinci®* Hysterectomy (Cancer)

**Potential Patient Benefits**

*vs. Open Surgery*
- More precise removal of cancerous tissue
- Fewer complications
- Less pain
- Minimal scarring

*vs. Traditional Lap Surgery*
- Fewer/similar complications
- Fewer conversions to open surgery
- Less need for narcotic pain med

*vs. Open & Traditional Lap Surgery*
- Less blood loss
- Shorter hospital stay
- Faster recovery

**Potential Patient Risks**

- Injury to the ureters (the ureters drain urine from the kidney into the bladder)
- Vaginal cuff problem (replaces cervix): scar tissue in vaginal incision, infection, bacterial skin infection, pooling/clotting of blood, incision opens or separates
- Injury to bladder (organ that holds urine), bowel injury, vaginal shortening, problems urinating (cannot empty bladder, urgent or frequent need to urinate, leaking urine, slow or weak stream)
- Abnormal hole from the vagina into the urinary tract or rectum, vaginal tear or deep cut

See the last slide for references.
### A comparative study of 3 surgical methods for hysterectomy with staging for endometrial cancer: robotic assistance, laparoscopy, laparotomy

John F. Boggess, MD; Paola A. Gehrig, MD; Leigh Cantrell, MD; Aaron Shafer, MD; Mildred Ridgway, MD; Elizabeth N. Skinner, MD; Wesley C. Fowler, MD

**Study limitations discussed by the authors:** “it was not randomized; because of our relatively recent incorporation of robotic technology, we could not examine long-term oncologic results.”

**Financial disclosure:** None were included in the publication.

**Table:**

<table>
<thead>
<tr>
<th></th>
<th>Open (n=138)</th>
<th>Lap (n=81)</th>
<th>Robotic (n=103)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years)</td>
<td>64.0</td>
<td>62.0</td>
<td>61.9</td>
<td>Open vs. dV=.06 Lap vs. dV=.95</td>
</tr>
<tr>
<td>Mean BMI (kg/m²)</td>
<td>34.7</td>
<td>29.0</td>
<td>32.9</td>
<td>Open vs. dV=.17 Lap vs. dV=.0008</td>
</tr>
<tr>
<td>Mean EBL (ml)</td>
<td>266.0</td>
<td>145.8</td>
<td>74.5</td>
<td>Open vs. dV&lt;.0001 Lap vs. dV&lt;.0001</td>
</tr>
<tr>
<td>Mean operative time (skin-to-skin) (min)</td>
<td>146.5</td>
<td>213.4</td>
<td>191.2</td>
<td>Open vs. dV&lt;.0001 Lap vs. dV&lt;.0001</td>
</tr>
<tr>
<td>Mean total lymph nodes (n)</td>
<td>14.9</td>
<td>23.1</td>
<td>32.9</td>
<td>Open vs. dV&lt;.0001 Lap vs. dV&lt;.0001</td>
</tr>
<tr>
<td>Mean hospital stay (days)</td>
<td>4.4</td>
<td>1.2</td>
<td>1.0</td>
<td>Open vs. dV&lt;.0001 Lap vs. dV=.001</td>
</tr>
<tr>
<td>Complications</td>
<td>29.7%</td>
<td>13.6%</td>
<td>5.8%</td>
<td>Open vs. dV&lt;.0001 Lap vs. dV=.07</td>
</tr>
<tr>
<td>Conversions to Open</td>
<td>---</td>
<td>4.9%</td>
<td>2.9%</td>
<td>Lap vs. dV=.7</td>
</tr>
</tbody>
</table>

**Compared to open surgery:**
- Fewer complications

**Compared to open and lap surgery:**
- Less blood loss
- Higher lymph node yield
- Shorter hospital stay

U.S. Adoption of MIS – Malignant Hyst.

Estimated Adoption of Minimally Invasive Surgery (MIS)

Percentage of all procedures

FDA clearance of da Vinci® Surgery GYN, 2005

Rapid decline

Rapid increase

OPEN

DA VINCI


IMPACT OF ROBOTIC-ASSISTED SURGERY:
Prior to the introduction of robotics, most hysterectomies were performed using a large incision (open surgery). The overall rate of minimally invasive surgery (vaginal and laparoscopy) remained relatively unchanged.

Following the introduction of robotics (da Vinci Surgery), the rate of open surgery began to rapidly decline, while the rate of minimally invasive surgery (vaginal, laparoscopy and da Vinci Surgery) began to rise.

Today, open surgery is used in only about 20% of hysterectomies.

Intuitive Surgical, Inc. PN 873930 rev F 4/2014

1. Inpatient data: Nationwide Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCLIP), Agency for Healthcare Research and Quality
2. Outpatient data: Solucient® Database - Truven Health Analytics (Formerly Thomson-Reuters) 3. da Vinci data: ISI Internal Estimates
LYMPH NODE DISSECTION
Pelvic Lymph node dissection
Pelvic Lymph node dissection
Sentinel lymph node dissection
RADICAL HYSTERECTOMY
# TYPES OF HYSTERECTOMY

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Extrafascial: pubocervical ligament is incised allowing lateral reflection of ureter</td>
<td>benign, Ia1</td>
</tr>
<tr>
<td>II</td>
<td>Medial half of cardinal &amp; uterosacral ligs.</td>
<td>Ia2</td>
</tr>
<tr>
<td></td>
<td>2 cm of vagina removed</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Entire cardinal and uterosacral ligaments and upper third (4cm) of vagina removed</td>
<td>Ib</td>
</tr>
<tr>
<td>IV</td>
<td>Periureteral tissue, superior vesicle artery, and 3/4 of upper vagina removed</td>
<td>Anterior recurrence</td>
</tr>
<tr>
<td>V</td>
<td>Removal of distal ureter and bladder</td>
<td>Exent.</td>
</tr>
</tbody>
</table>
Radical Hysterectomy anatomy
Radical hysterectomy – ligating uterine vessels
Cervical Cancer – radical hysterectomy
Cervical Cancer – radical hysterectomy
What should your patient expect

• To be offered the surgical procedure that fits their diagnosis, co-morbidities
• Most patient with endometrial cancer are candidates for robotic hysterectomy
• Small pelvic masses are typically approached with MIS – laparoscopy or robotics
• Cervical cancer – depending on tumor size, patient body habitus
Patients who may NOT be candidates for MIS

• Suspected advanced ovarian malignancy
• Very large pelvic masses
• Cervical cancer patients with large tumors or very high BMI
• Patients with medical comorbidities (such as lung disease) that may prevent steep Trendelenburg positioning
• Patients with severe glaucoma
Port placement

- 1mm Robotic port (RP)
  - RP1: monopolar scissors
  - RP2: camera
  - RP3: gamma bipolar
  - RP4: porgrapn

- 8.5mm assistant arm
  - AAE/SA suction
  - integrator

- 5-12mm assistant arm
  - AAE/FM ureter grasper

Dimensions:
- 15-30 cm
- 8-12 cm
- 20-27 cm
Recovery

- 1-2 night stay in hospital (typically home POD 1)
- Faster return to pre-surgical functional status – some patients are back to work in 3 weeks
- Limits:
  - No heavy lifting (>10lbs) for 6-8 weeks
  - Nothing in vagina for 8 weeks
References.


Thank you!

Questions?