Robotic Foregut Surgery

2014 Masters of Minimally Invasive Surgery

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Case Presentation: Patient PH

82 y/o woman with HTN, PVD, BrCa

- 10 year history of dysphagia, GERD, chest pain with eating and known hiatal hernia
- Followed for a decade by GI and previously underwent EGD with dilations, capsule endoscopy, medical management
- 30 lb wt loss over 5 years, stable now
- “I’d rather die than go on like this…”
Case Presentation: Patient PH

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Robotic Foregut Surgery

Why do it?
Robotic Foregut Surgery
Why do it?
Robotic Foregut Surgery

Why do it?

- 3D with 10x + zoom imaging
- Wristed instruments with intuitive movement
- Tremor filtration
Robotic Foregut Surgery

Why do it?

- Laparoscopic is better than open (laparotomy or thoracotomony)\(^1\)
- Yet many are still offered open surgeries

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Robotic Foregut Surgery

Why do it?

• We need to do laparoscopic better.

• PEH: 57% recurrence rate at 5 years

Robotic Foregut Surgery

Why do it? The data for robotic giant PEH repair.

- Single center series: 19 patients underwent robotic giant PEH repair.¹
  - No deaths or recurrences 15 mo median f/u
  - 1 conversion

- Single center series: “case-control study” of 12 robotic, 17 laparoscopic, and 13 open.²
  - Decreased LOS and post-operative complications compared to open
  - Similar to laparoscopic

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Robotic Foregut Surgery

Why do it? The data for robotic giant PEH repair.

- Single center series: 14 patients underwent robotic giant PEH repair.\(^1\)
  - No deaths or robotic related morbidity
  - Felt to be superior for hiatal dissection
- Single center series: 40 patients with large PEH underwent robotic repair with 1 year follow-up.\(^2\)
  - Subjectively, surgeons felt robotics was helpful
  - Relatively low recurrence rate

Robotic Foregut Surgery

How do we do it? Everytime

- Complete resection of the hernia sac from mediastinum.
- Appropriate esophageal mobilization
- Proper hiatal closure
- Fundoplication
Robotic Foregut Surgery

How do we do it? Sometimes

- Anterior gastropexy\(^1\)
- Crural mesh augmentation\(^2\)
- Esophageal lengthening

Robotic Foregut Surgery

How do we do it? Set-up

- Placement of ports in robotic surgery more critical than in laparoscopic.
- Current technology does not allow for camera “port hopping”...yet.
- Do not have unrestricted movement of the ports.
Robotic Foregut Surgery

How do we do it? Set-up

Intuitive Procedure Care for da Vinci Foregut Surgery
Port Placement
All ports may need minor adjustments based on the patient’s BMI and body habitus. Port locations should be placed after insufflation with 15 mmHg. Position the remote center on the cannula (thick black band) at the level of the peritoneum.

- **da Vinci Camera Port, 12 mm (Blue):** Place port 2 cm lateral to the umbilicus in the left upper quadrant.

- **da Vinci Instrument Arm 1 Port, 8 mm (Yellow):** Place the port a minimum of 8 cm away from the camera port in the left upper quadrant and 2-3 cm medial to the left MCL.

- **da Vinci Instrument Arm 2 Port, 8 mm (Green):** Place the port a minimum of 8 cm from the camera port in the right upper quadrant. It should be high enough to reach the epigastrium.

- **da Vinci Instrument Arm 3 Port, 8 or 5 mm (Red):** Place the port ~8 cm lateral and 2-3 cm inferior to instrument arm 2.

- **Assistant Port, 12 mm (A), Optional:** Place the port in between instrument arm 2 and camera port, at least 5 cm away from either port.

- **Liver Retractor, 5 mm (B), Optional:** Insert the liver retractor 2 cm subxiphoid.
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‣ How do we do it? Set-up

Robot docked: 1, 12-mm robotic camera docked (at umbilicus); 2, 5-mm robotic arm docked (left anterior axillary line); 3, 12-mm laparoscopic assistant trocar (left mid-axillary line); 4, 5-mm robotic arm docked (right anterior axillary line); and 5, Nathanson retractor.

Robotic Foregut Surgery

How do we do it? Set-up

Robotic Foregut Surgery

How do we do it? Set-up

- 5 or 8 mm robot port
- Long 12 mm lap port
- 5 or 8 mm robot port
- 8 mm robot port or 5 mm lap port
- Standard 12 mm lap port
Robotic Foregut Surgery

How do we do it? Set-up

- 5 or 8 mm robot port
- Long 12 mm lap port
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- 8 mm robot port or 5 mm lap port
- Standard 12 mm lap port
- 5 mm lap port
Robotic Foregut Surgery

How do we do it? Set-up

**Instrumentation**
- 8 mm robot port
- Fenestrated bipolar
- Large needle driver
- 5 mm robot port
- Thoracic or bowel grasper
- Needle driver
Robotic Foregut Surgery

How do we do it? Set-up

Instrumentation

- 8 mm robot port
- Cardiere forceps
- Large suture cut needle driver
- Hot shears™ or Permanent spatula or Monopolar hook
- Vessel sealer™ or Harmonic
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How do we do it? Set-up

- Instrumentation
  - 5 mm robot port
  - Thoracic or bowel grasper
  - Needle driver
  - Monopolar cautery hook or spatula
  - Harmonic shears
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How do we do it? Set-up

- Instrumentation
  - 12 mm laparoscopic port
  - Specimen retrieval
  - Suture passing
  - Stapler insertion
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How do we do it? Set-up

- Miniaturization
  - 8.5 endoscope with cannula
  - 5 mm robot ports x2
  - 5 mm lap ports x2
  - Suture on ski needle
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How do we do it? Set-up

- Phase shift cephalad for mediastinal dissection
- Port selection can depend upon OR staff
- 8 cm minimum between robot ports
- Narrow or thick abdomen may benefit from long robot ports
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- How do we do it? The procedure

Video of Hot Shears Dissection
Reduction of SAC
“robot sac dissection with shears”
Robotic Foregut Surgery

- How do we do it? The procedure

Video of spatula dissection of mediastinum
Robotic Foregut Surgery

- How do we do it? The procedure

Video of Crural closure and Mesh
"robot repair of crura with mesh"
Robotic Foregut Surgery

- How do we do it? The procedure

Video of Colles?
“robot collis 8 14 21”