Laparoscopic Hernia Repair

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Several Different Types of Hernia

- Ventral Hernia
  - Umbilical
  - Epigastric
  - Spigelian
  - Incisional
- Inguinal Hernia
  - Direct
  - Indirect
- Paraesophageal Hernia
  - Four different types

Advantages of Laparoscopic Ventral vs. Open Hernia Repair

- Lower wound infection rate: 2.6% vs. 5.8%
- Lower Mesh infection rates: 2% vs. 3.5%
- Recurrence rates: 4% vs. 16%
- Overall Complications: 23.2 vs. 30.2%.
- Drains not needed.

Laparoscopic Ventral Hernia Repair

- Patient selection is very important
- If incisional hernia repair is needed, need full history of surgical procedures
- No ongoing infections, fistula, or open wounds can be present
- If loss of domain is present, laparoscopic approach may not be able to bridge the gap
Trocar Placement for Laparoscopic Incisional Hernia Repair

<table>
<thead>
<tr>
<th>Author Type of repair</th>
<th>Number of patients</th>
<th>Follow-up period</th>
<th>Complication rate (%)</th>
<th>Hernia recurrence rate (%)</th>
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</thead>
<tbody>
<tr>
<td>Rutledge McVay</td>
<td>396</td>
<td>9 years</td>
<td>NR</td>
<td>2.0</td>
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<tr>
<td>Amid Lichtenstein</td>
<td>3,250</td>
<td>Average of 4 years (range: 1 to 8 years)</td>
<td>NR</td>
<td>1.5</td>
</tr>
<tr>
<td>Rutkow and Robbins</td>
<td>2060</td>
<td>NR</td>
<td>0.3</td>
<td>0.1</td>
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<tr>
<td>Nyhus</td>
<td>1200</td>
<td>37 years</td>
<td>NR</td>
<td>1.6</td>
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<tr>
<td>Felix Transabdominal preperitoneal laparoscopic repair TAPP</td>
<td>733</td>
<td>24 months</td>
<td>13</td>
<td>0.3</td>
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<tr>
<td>Felix Total extraperitoneal laparoscopic repair TEP</td>
<td>382</td>
<td>Average of 9 months</td>
<td>11</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Laparoscopic Inguinal Hernia Repair

Trocar Placement
**Inguinal Hernias**

- **Type I (sliding hernia)**
  - Upward migration of GE junction into posterior mediastinum
  - Represent 90% of PEHs
  - Found in greater than 10% patients on routine GI studies
  - Prevalent during third to fifth decades
  - Often associated with symptoms of GERD

**Paraesophageal Hernia**

- **Type I (sliding hernia)**
  - Upward migration of GE junction into posterior mediastinum
  - Represent 90% of PEHs
  - Found in greater than 10% patients on routine GI studies
  - Prevalent during third to fifth decades
  - Often associated with symptoms of GERD

- **Type II (rolling)**
  - Upward displacement of gastric fundus with normal positioned GE junction
  - Less than 2% of all HHs
  - Common symptoms include postprandial fullness/pain, nausea, dysphagia and heartburn
  - Can present with anemia and pulmonary dysfunction less commonly
Paraesophageal Hernia

- Type III (mixed)
- About 5% of all HHs
- Combines type I and type II
- Symptoms similar to type II
- Most prevalent in fifth to sixth decade
- Most commonly on left side of diaphragm
- Divided into Type 3A (natural) and Type 3B (postoperative/iatrogenic)
- Type IV contains omentum/colon

Laparoscopic Hernia Repair

- Lots of different types of hernias
- Many can be fixed using laparoscopic techniques
- Patient selection is important
- Surgical wisdom comes in knowing when not to operate
**Abdominal Wall Reconstruction**

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**Ventral Hernia Repair Principles**

- Incorporation of the remaining abdominal wall in the repair
- Tension-free
- Dynamic muscular support

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**Muscle and Investing Fascia**

**Abdominal Wall Reconstruction**

- Autologous tissue rearrangement
- Prosthetic or bioprosthetic materials
- Structural anatomy should be integrated with understanding the dynamic function of the abdominal wall.
### Treatment Options

- Primary Repair
- Mesh
- “Components Separation” with and without mesh
- Local flaps and Free tissue transfer
- Staged repair

### Mesh

- Nonabsorbable: Polypropylene / Polyester / PTFE
- Bioprosthetic
- Anchor mesh to well vascularized tissue
- Complications:
  - Seroma, Infection, fistula formation, erosion, & continued drainage

### Primary Repair

- Patient selection
- Limited to small defect
- Highest recurrence rate
- Tension leads to ischemia and failure

### Mesh Placement
Onlay Technique

- Still most popular
- Milliken survey: 1/2 of surgeons use this repair without closing the fascial defect.
- The disadvantages:
  - Wide tissue undermining predisposes to wound complications
  - The pressure required to disrupt the mesh from the anterior abdominal wall is less than other repairs

Inlay Technique

- Provides for a tension-free repair at the time of surgery
- No undermining of the onlay repair
- Intra-abdominal pressure - tension to the mesh-fascial interface, which is the weakest point of the repair

Intraperitoneal Underlay Placement

- Open and laparoscopic.
- Large overlap allows for better tissue ingrowth
- Different Fixation techniques
- Recurrence 5%

Open Intraperitoneal Underlay
**Retrorectus, Retroperitoneal Underlay**

- Rives and Stoppa
- Mesh - above the posterior rectus sheath and beneath the rectus muscle
- Overlap between the mesh and fascia
- Distribution of pressure over a wider area (Pascal’s principle)
- Pressure-induced apposition promotes ingrowth
- Physiologic repair

**Components Separation**

- Oscar Ramirez (1990):
  - Cadaveric dissection
  - Incision 1cm lateral to linea semilunaris
  - Ext oblique (easily separated from internal oblique in avascular plane)
  - Rectus flap can be advanced
    - 5cm epigastrum
    - 8-10cm middle
    - 3cm suprapubic

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**Rives-Stoppa Repair**

**Open Components Separation**

![Diagram of Rives-Stoppa Repair and Open Components Separation]
### Open Component Separation

- Rectus muscle medialization - restores dynamic abdominal wall function
- Cosmetic improvement - excision of excess tissue
- Drawback – large flap dissection with devascularization

### Minimally Invasive Component Separation

- Rectus Abdominis Perforators Preservation
- Significantly Reduces Wound Complications

### When laparoscopic approach is not an option

![Images of surgical outcomes]

### When laparoscopic approach is not an option

![Images of surgical outcomes]
When laparoscopic approach is not an option

enterocutaneous fistula

enenterocutaneous fistula

When laparoscopic approach is not an option
When laparoscopic approach is not an option

<table>
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<tr>
<th>![Image 1]</th>
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![CT Scan Image 1] ![CT Scan Image 2]