Laparoscopic Surgery: Keeping it safe!

Illustrative Consent
- Assures coverage of risk/benefit ratio
- Opportunity for interaction/questions
- A “take home” to guide additional/later discussion
- Medical-legal documentation

Laparoscopic Surgery: Keeping it safe!

Prospective Study of Nerve Injury
- Prospective study of 616 gynecologic surgeries
- Pre-existing neuropathy in 1.9%
- New neuropathy developed in 1.8% - 14 pts
  - 5 femoral
  - 5 lateral femoral cutaneous
  - 1 ilioinguinal
  - 1 saphenous
  - 1 genito-femoral
  - 1 common fibular
- Complete resolution in 91% at a median of 31 days

Laparoscopic Surgery: Keeping it safe!

Carefully Position the Patient
- Care with shoulder braces
- Arms tucked at sides
- Buttocks at end of table
- Hips in line with abdomen in Allen stirrups
  - Allows free movement of lower ports
- Fingers are visible and hand is padded
- Personally take your time to assure proper patient position!

Laparoscopic Surgery: Keeping it safe!

Intra-operative: Trocar

> 50% trocar-related injuries to the bowel and vasculature occur during initial entry

Laparoscopic Surgery: Keeping it safe!

Intra-operative: Trocar

GI injuries (30-50%) and of vascular injuries (15-50%) not diagnosed at the time of injury. Mortality rates of 3-30%


Mentally Visualize Location of Underlying Structures

But remember that body habitus makes a difference

1910

Hans Christian Jacobaeus of Sweden, reported the first laparoscopic operation on humans

It is puncture itself that causes risk

3 PUNCTURE TECHNIQUE
Proper port placement:
- Minimizes instrument/scope interference (Dueling swords, blind spots)
- Maximizes ergonomics
- Decreases mental/physical fatigue
- Minimizes time
- Improves safety
- USE as many as needed to assure adequate visualization

Laparoscopic Surgery: Keeping it safe!

**Intra-operative: Trocar**

Distance umbilicus and the aortic bifurcation

- 0.4 cm in normal weight patients (BMI <25 kg/m²),
- 2.4 cm in overweight patients (BMI 25-30 kg/m²)
- 2.9 cm in obese patients (BMI >30 kg/m²)
- Lifting the abdominal wall provides significant elevation of the peritoneum (6.8 cm above the viscera)

**Make sure the table is LEVEL.....**

Flat table puts bifurcation cephalad to trocar path

Trendelenburg puts bifurcation in more direct trocar path

Intra-abdominal adhesions:
- No prior abdominal surgery: ≤ 0.7%
- Previous laparoscopy: ≤ 15%
- Low transverse incision: ≤ 28%
- Midline laparotomy: ≤ 60%

Bhoyrul reported 629 trocar injuries
- 29% involved bowel injury
  - 73% involved small bowel
  - 12% unrecognized
  - 19% of deaths due to unrecognized bowel injury
  
Bhoyrul S, J Am Coll Surg 2001

Baggish reported 130 bowel injuries
- 63% related to trocar insertion
  - 77% small bowel
  - 41% large bowel

Baggish MS, OBG Management 2008
Laparoscopic Surgery: Keeping it safe!
Potential Benefits of Hand Assisted Laparoscopic Surgery

- Maintains tactile sensation (Like open procedure)
- Maintains superior visualization
- See and feel in a deep pelvis
- Control of hemostasis (immediate digital hemostasis)
- Improved cosmesis
- Decreased risk of wound infection
- Decreased blood loss
- Decreased hospital stay
- Decreased post operative pain
- Less pain

Allows for removal of specimens
(Minimizes need for morcellation)

Laparoscopic Surgery: Keeping it safe!
Intra-operative: Trocar
Number of insertion attempts

<table>
<thead>
<tr>
<th>Entry into peritoneal cavity:</th>
<th>Complication rates:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st attempt</td>
<td>85.5-87%</td>
</tr>
<tr>
<td>2 attempts</td>
<td>8.5-11.6%</td>
</tr>
<tr>
<td>3 attempts</td>
<td>2.6-3.0%</td>
</tr>
<tr>
<td>&gt; 3 attempts</td>
<td>0.3-1.6%</td>
</tr>
</tbody>
</table>

Complications include extra-peritoneal insufflation, omental and bowel injuries and failed laparoscopy.

Richardson, Gynaecol Endosc. 1999

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Intra-operative: Trocar
GI Vascular

<table>
<thead>
<tr>
<th>GI</th>
<th>Vascular</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.11%</td>
<td>0.01%</td>
</tr>
<tr>
<td>0.05%</td>
<td>0%</td>
</tr>
<tr>
<td>0.04%</td>
<td>0.04%</td>
</tr>
</tbody>
</table>

51 publications:

- Open technique
- Direct entry

Molloy, Aust N Z Obstet Gynaecol. 2002
Laparoscopic Surgery: Keeping it safe!
Intra-operative: Trocar

- Left upper quadrant insertion (Palmer’s Point: 1974) is located 3 cm below the middle of the left costal margin
- Veress needle is inserted perpendicular to the patient’s skin.

Avoid in those with gastric, splenic surgery, splenomegaly, full stomach

1. Left upper quadrant (LUQ, Palmer’s) laparoscopic entry with known periumbilical adhesions or history or presence of umbilical hernia, or after three failed insufflation attempts at the umbilicus.
2. The various Veress needle “safety checks” do not provide useful information during placement.
3. The Veress intraperitoneal (VIP-pressure ≤ 10 mm Hg) is a reliable indicator of correct intraperitoneal.
4. The angle of the Veress needle insertion should vary according to patient’s BMI (45 degrees in non-obese to 90 degrees in obese women).
5. There is no evidence that the open entry technique is superior to or inferior to the other entry techniques.

After pneumoperitoneum is established, always evaluate the abdominal contents below insertion site (and document lack of injury).

Never be afraid to place additional ports to improve visualization or to repair injury.

Converting to HALS or an open operation (to complete the procedure or repair an injury) is NOT a sign of “weakness”.
Laparoscopic Surgery: Keeping it safe!
Intra-operative: Trocar

- Veress needle
- Trocar Types
  - Conventional
    - Pyramidal
    - Conical
  - Open
    - Hasson
  - Dilating tip
- Safety-shield
- Disposable
- Needle/Sleeve
- Step
- Optical
  - Optiview
  - Versiport

Master the use of 1 or 2 trocars!!!
Use as many s necessary

Law, Obstet Gynecol Survey 2014

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Laparoscopic Surgery: Keeping it safe!
Intra-operative: Energy

Electrosurgery

- “Cut” and “coag” settings do not refer to a particular tissue effect (i.e., tissue cutting or coagulation), but to the current waveform
  - “Cut” setting: unmodulated, continuous current
  - “Coag” setting: modulated, interrupted current
- Ohm’s law, at the same power settings, interrupted waveform has a higher voltage but a lower current than continuous waveform. Continuous waveform current is associated with lower-energy electrons: a safer choice of waveform for most laparoscopic applications
- The proportion of time the current flow is interrupted can be adjusted using various “blend” settings

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Laparoscopic Surgery: Keeping it safe!
Intra-operative: Energy

Tissue dissection
transection
destruction
Hemostasis

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Laparoscopic Surgery: Keeping it safe!
Intra-operative: Energy

Low Voltage
High Voltage

Increasing risk of tissue “injury”