Laparoscopic colectomy: where do we stand?

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Tufts University School of Medicine
Staff Surgeon and Program Director
Department of Colon and Rectal Surgery
Lahey Clinic Medical Center

Disclosure of Affiliations

• Applied Medical

Laparoscopic Colectomy

History
Who is doing it?
Why do it?
Barriers to adoption
Technical Advances
The future

1991: The beginning

Minimally Invasive Colon Resection
(Laparoscopic Colectomy)

M. Jacobs, M.D., J. C. Velez, M.D., and H. S. Goldstein, M.D.

Brief Clinical Report
Laparoscopy-Assisted Sigmoid Resection

Denis L. Fowler, M.D., and Sharon A. White, R.N.

Concern regarding cancer

Wound Recurrence Following Laparoscopic Colon Cancer Resection
Results of The American Society of Colon and Rectal Surgeons Laparoscopic Registry

Peter Valuckis, M.D., Adrian E. Oehsme, M.D., Frederick L. Greenway, M.D.,
Glenda D. Steege, M.D., F.A.C.S., Anthony J. Simon, M.D., Gary J. Anthony, M.D.,
Lynn A. Weston, M.D., Robert W. Beart, J. M.D.

From the Division of Colorectal Surgery, Los Angeles County and University of Southern California Medical Center, Los Angeles, California

COST study

N Engl J Med 2004
Ann Surg 2007

Recurrence
Survival
### Laparoscopic Colectomy

**History**

**Who is doing it?**
- Why do it?
- Barriers to adoption
- Technical Advances
- The future

**Why do it?**
- Benefits
  - A day less in hospital
  - Less pain
  - Faster return to work
  - Better cosmesis
  - Wound complications of lesser magnitude

### Everybody’s Doing It?

<table>
<thead>
<tr>
<th>Nationwide Inpatient Sample</th>
<th>2001-3</th>
<th>2005-7</th>
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</thead>
<tbody>
<tr>
<td>Benign disease</td>
<td>6%</td>
<td>12%</td>
</tr>
<tr>
<td>Malignant disease</td>
<td>2%</td>
<td>9%</td>
</tr>
</tbody>
</table>

### Laparoscopic Colectomy

**Why do it?**

**Benefits**
- Fewer adhesions
  - Important for Crohn’s patients

### Laparoscopic Colectomy

**History**

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### Laparoscopic Colectomy

**Barriers to adoption**

**Why do it?**

**Benefits**
- Fewer adhesions
  - Important for Crohn’s patients
Barriers To Adoption

Benefits are modest
It is hard to do
  • Multiple quadrants
  • Work in retroperitoneum
  • Anastomosis
It takes longer
Pay is the same…or less

Learning by doing?

American Board of Surgery database
2434 general surgeons at recertification

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Mean</th>
<th>70%</th>
<th>90%</th>
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<tbody>
<tr>
<td>Colectomy</td>
<td>11</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>Total colectomy</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>APR</td>
<td>0.8</td>
<td>1</td>
<td>2</td>
</tr>
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Positioning

Gravity is good.

Gravity is dangerous.

Vessel Division

Clips
Stapler
Harmonic
Bipolar vessel sealing
  • Gyrus
  • Ligasure
  • Enseal

Vessel Division: When Staplers Go Bad

Middle colic vessel
**Laparoscopic ileocolic resection**

**Crohn’s ileocolitis**
- Fistula through iliacus and quadratus lumborum muscles to iliac bone with osteitis

**Initial assessment**

**Division of fistula**

**A Blue Diamond moment**

**Crohn’s ileocolitis: Fistula to Iliac Bone**
- Retrograde mobilization of hepatic flexure and isolation of ileocolic vessels
Laparoscopic proctocolectomy and ileostomy

Severe ulcerative colitis
Rectal cancer
Anal stenosis
Malnutrition

Hand Assisted Laparoscopic Colectomy

Total Abdominal Colectomy Ileorectal Anastomosis: Attenuated FAP

Hand-assisted: 2 weeks postoperatively

History of HALS

Hand assisted laparoscopic anterior resection

Hartmann reversal + Completion sigmoid colectomy
Restorative proctocolectomy, IPAA

HALS vs. laparoscopic colectomy

Prospective randomized multi-center trial, n=95

Left colectomy and Total abdominal colectomy

• No difference in postoperative outcome
• HALS faster
  • Left colectomy: 33 min
  • Total colectomy: 57 min

<table>
<thead>
<tr>
<th></th>
<th>HAL (n=47)</th>
<th>LAP (n=48)</th>
<th>p value</th>
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</thead>
<tbody>
<tr>
<td>Tol. Liquids</td>
<td>1.5</td>
<td>1.5</td>
<td>0.66</td>
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<tr>
<td>Tol. Solids</td>
<td>3.0</td>
<td>3.0</td>
<td>0.77</td>
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<tr>
<td>Return BF</td>
<td>3.5</td>
<td>3.5</td>
<td>0.64</td>
</tr>
<tr>
<td>LOS</td>
<td>1.5</td>
<td>4.0</td>
<td>0.55</td>
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Mean ± SD, median

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<thead>
<tr>
<th></th>
<th>HAL (n=14)</th>
<th>LAP (n=15)</th>
<th>p value</th>
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<tbody>
<tr>
<td>Tol. Liquids</td>
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<td>0.86</td>
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<tr>
<td>Tol. Solids</td>
<td>3.0</td>
<td>3.0</td>
<td>0.64</td>
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<tr>
<td>Return BF</td>
<td>3.5</td>
<td>1.5</td>
<td>0.85</td>
</tr>
<tr>
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<td>0.58</td>
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Mean ± SD, median

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<tr>
<td>Incision Size (cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left colectomy</td>
<td>8.2 ± 1.5</td>
<td>6.1 ± 2.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Total colectomy</td>
<td>7.8 ± 0.6</td>
<td>6.7 ± 2.1</td>
<td>0.09</td>
</tr>
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Mean ± SD, median
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<td>How to succeed</td>
</tr>
<tr>
<td>Technical Advances</td>
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**The future**

### The Future?

- Laparoscopy for rectal cancer
- Single port laparoscopic surgery (SILS)
- Robotics
- Natural Orifice Transluminal Endoscopic Surgery (NOTES)
- Transanal minimally invasive surgery (TAMIS)

### Laparoscopic Proctectomy

- [Image: Laparoscopic Proctectomy](image)

### Ongoing prospective, randomized trials

- **Laparoscopic vs. open proctectomy for rectal cancer**
  - ACOSOG Z6051
  - A La CaRT: *Australasian Laparoscopic Cancer of the Rectum Trial*

### Rectal Cancer: The Difficult Pelvis

- T4 cancer
- BMI = 84

- [Image: Rectal Cancer: The Difficult Pelvis](image)
Old Fashioned Colectomy

Right colectomy  Subtotal colectomy

SILS Platforms

SILS Colectomy

Remzi et al. Colorectal Diseases, 2008 (Uni-X Device)

New Yorker magazine

Never let the facts get in the way of a good story

Potential Benefits

<table>
<thead>
<tr>
<th>Description</th>
<th>Status</th>
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<tbody>
<tr>
<td>Easier for Surgeon</td>
<td>NO</td>
</tr>
<tr>
<td>Faster</td>
<td>NO</td>
</tr>
<tr>
<td>Cheaper</td>
<td>NO</td>
</tr>
<tr>
<td>Better for Patient</td>
<td>NO</td>
</tr>
<tr>
<td>Cosmesis</td>
<td>MAYBE</td>
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