Laparoscopic Resection Of Colon & Rectal Cancers

R Sim
Centre for Advanced Laparoscopic Surgery, TTSH
The feasibility of an operation is not the best indication for its performance.

Henry Cohen 1900-1977
The Issues

• Feasibility and safety
• Adequacy - same radical surgery as open op.
• Efficacy - short term benefits and long term oncologic results
• Time and Cost - is it worth the effort?
• Training and certification - who can be accredited?
Laparoscopic Colorectal Resection

- Cancer, complicated diverticular disease, inflammatory bowel disease, functional
- Multiple quadrants
- Retract small bowel
- Expose and dissect large planes
- Remove large, bacteria-laden organ
- Malignancy, port site mets
- Perform bowel anastomosis
Curative Oncologic Resection (I)

- proximal lymphovascular ligation and complete lymphadenectomy with
- wide en bloc resection of tumor-bearing bowel segment with adjacent soft tissue and mesentery,
- resection of suitable margins of the normal bowel proximal and distal to the cancer, and
- occlusion of the bowel above and below the tumor to minimize the possibility of intraluminal tumor spread.
Curative Oncologic Resection (II)

• minimal manipulation of the tumor-bearing segment

• rectal washout with tumoricidal solution for rectosigmoid cancers

• placement of the specimen as soon as possible into an impermeable bag prior to delivery through the abdominal wall
Curative Oncologic Resection (III)

- protection of the peritoneal cavity from contamination
- assessment of the liver and peritoneal cavity for metastatic disease
- assessment of conditions which allow an anastomosis or a stoma to be safely performed.
Rectal Cancer Surgery (I)

Anatomic definition of the rectum is highly variable

Cure, avoid local failure and maintain quality of life, including bowel, bladder and sexual function

Total mesorectal excision (TME) with Autonomic nerve preservation (ANP)

Distal rectal transection

Extended resection and lateral pelvic nodes
Rectal Cancer Surgery (II)

The surgeon as a prognostic factor after the introduction of total mesorectal excision in the treatment of rectal cancer.


Adjuvant therapy for rectal cancer cannot be based on the results of other surgeons

F Seow-Choen, Br J Surg 2002; 89: 946-947
Pathologic Evaluation of TME Operation

Intact Mesorectum

Quirke, et al
Lancet 1986; 2:996-999
### Published prospective randomized trials comparing laparoscopic versus open surgery for colon cancer – Operative Details

<table>
<thead>
<tr>
<th>Author</th>
<th>Origin</th>
<th>Year</th>
<th>Follow-up (months)</th>
<th>Number</th>
<th>Conversion (%)</th>
<th>Blood loss (ml)</th>
<th>Op Time (min)</th>
<th>Lymph nodes</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lap</td>
<td>Open</td>
<td>Lap</td>
<td>Open</td>
<td>Lap</td>
</tr>
<tr>
<td>Lacy</td>
<td>Spain</td>
<td>'95</td>
<td>6.5</td>
<td>25</td>
<td>26</td>
<td>4/25 (16)</td>
<td>107±104</td>
<td>217±268 NS</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>11/19/19</td>
<td>105 (1-196)</td>
<td>260±114</td>
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<tr>
<td>Stage</td>
<td>Denmark</td>
<td>'97</td>
<td>14</td>
<td>18</td>
<td>16</td>
<td>3/18 (16.7)</td>
<td>275</td>
<td>300 NS</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>37(10-120)</td>
<td>250±50</td>
<td>160±75</td>
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<tr>
<td>Milsom</td>
<td>USA</td>
<td>'98</td>
<td>20</td>
<td>42</td>
<td>38</td>
<td>4/42 (9.5)</td>
<td>252±222</td>
<td>344±626 NS</td>
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</tr>
</tbody>
</table>

NS – Non-significant
* – Significant

### Published prospective randomized trials comparing laparoscopic versus open surgery for colon cancer – Results

<table>
<thead>
<tr>
<th>Author</th>
<th>Passage of flatus</th>
<th>Length of stay (d)</th>
<th>Morbidity (%)</th>
<th>Mortality (%)</th>
<th>Port site recurrence</th>
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</thead>
<tbody>
<tr>
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<td>Lap</td>
<td>Open</td>
<td>Lap</td>
<td>Open</td>
<td>Lap</td>
</tr>
<tr>
<td>Lacy</td>
<td>35.5±15.7 h</td>
<td>71.1±33.6 h*</td>
<td>5.2±1.2</td>
<td>8.1±3.8*</td>
<td>2(3)</td>
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<tr>
<td>Stage</td>
<td>-</td>
<td>3 (3-12)</td>
<td>8 (5-30)*</td>
<td>2(11)</td>
<td>0(0)</td>
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<tr>
<td>Milsom</td>
<td>3 d (0.8-8)</td>
<td>4 d (0.8-14)*</td>
<td>6 (3-37)</td>
<td>7 (5-24) NS</td>
<td>8(15)</td>
</tr>
</tbody>
</table>

NS – Non-significant
* – Significant
Short-term Quality-of-Life Outcomes Following Laparoscopic-Assisted Colectomy vs Open Colectomy for Colon Cancer
A Randomized Trial

Jane C. Weeks, MD
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Georgene Schroeder, MS

for the Clinical Outcomes of Surgical Therapy (COST) Study Group

ALTHOUGH LAPAROSCOPIC TECHNIQUES were first described in 1991,1 only in the past few years have newer optics and instrumentation allowed for the safe application of laparoscopic resection procedures. The first report of a successful laparoscopic colectomy in 1987 was followed by rapid widespread adoption of the procedure.2 In recent years, laparoscopic procedures for a number of other nonmalignant abdominal diseases, including appendicitis, inguinal hernia, gastroesophageal reflux disease, hiatal hernia, and nonmalignant uterine conditions, have become routine. The interest in laparoscopic approaches for these conditions has been driven by the theoretical benefits, including reduced postoperative pain, shortened length of stay, and earlier return to work, and perhaps by the technological imperative.3

Improvements in both technology and surgeons' comfort and skill with laparoscopic techniques have led to an interest in extending the indications for laparoscopic surgery to include curative resection of colon cancer. In laparoscopic-assisted colectomy (LAC), mobilization of the bowel is conducted laparoscopically and then the bowel is externalized for resection and anastomosis. Laparoscopic-assisted colectomy has emerged as the preferred minimally invasive strategy for colon cancer compared with standard open colectomy.

Conclusion Only minimal short-term QOL benefits were found with LAC for colon cancer compared with standard open colectomy. Until ongoing trials establish that LAC is as effective as open colectomy in preventing recurrence and death from colon cancer, this procedure should not be offered to patients with colon cancer.

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Conclusions

In this multi-institutional study, the rates of recurrent cancer were similar after laparoscopically assisted colectomy and open colectomy, suggesting that the laparoscopic approach is an acceptable alternative to open surgery for colon cancer.
Laparoscopy-assisted colectomy versus open colectomy for treatment of non-metastatic colon cancer: a randomised trial

Antonio M Lacy, Juan C García-Valdecasas, Salvadora Delgado, Antoni Castells, Pilar Taurné, Josep M Piqué, Josep Vila

Summary
Background Although early reports on laparoscopy-assisted colectomy (LAC) in patients with colon cancer suggested that it reduces perioperative morbidity, its influence on long-term results is unknown. Our study aimed to compare efficacy of LAC and open colectomy (OC) for treatment of non-metastatic colon cancer in terms of tumour recurrence and survival.

Methods From November, 1993, to July, 1998, all patients with adenocarcinoma of the colon were assessed for entry in this randomised trial. Adjunct therapy and postoperative follow-up were the same in both groups. The main endpoint was cancer-related survival. Data were analysed according to the intention-to-treat principle.

Findings 219 patients took part in the study (111 LAC group, 108 OC group). Patients in the LAC group recovered faster than those in the OC group, with shorter perioperative times (p=0.001), and shorter hospital stays (p=0.005). Mortality was lower in the LAC group (p=0.001), although LAC did not influence perioperative mortality. Probability of cancer-related survival was higher in the LAC group (p=0.02). The Cox model showed that LAC was independently associated with reduced risk of tumour relapse (hazard ratio 0.39, 95% CI 0.19-0.82), death from any cause (0.48, 0.23-1.01), and death from a cancer-related cause (0.38, 0.16-0.91) compared with OC. This superiority of LAC was due to differences in patients with stage III tumours (p=0.04, p=0.02, and p=0.006, respectively).

Interpretation LAC is more effective than OC for treatment of colon cancer in terms of morbidity, hospital stay, tumour recurrence, and cancer-related survival.

Lancet 2002; 359: 2224-29

Departments of Surgery (A M Lacy md, J C García-Valdecasas md, S Delgado md, J Vila md), Gastroenterology (A Castells md, J M Piqué md), and Anaesthesia (P Taurné md), Institut de Malalties Digestives, Hospital Clinic, Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), University of Barcelona, 08036 Barcelona, Spain

Correspondence to: Dr Antonio M Lacy (e-mail: alacy@medicina.ub.es)

Interpretation
LAC is more effective than OC for treatment of colon cancer in terms of morbidity, hospital stay, tumour recurrence, and cancer-related survival.

This superiority of LAC was due to differences in patients with stage III tumours.
COLOR (Dutch) Trial - Short term

- N=1005, 18% conversion
- Operative time 30min longer
- Bowel recovery 3.65 vs 4.52 days
- Hospital stay 8 vs 9 days
- Await long term oncologic results

N=5

CONCLUSION:
To the best of our knowledge, this is the first published series of such an operation. With good patient selection, laparoscopic-assisted TME and colonic J pouch-anal anastomosis is safe and feasible.

N=403

CONCLUSION:

Laparoscopic resection of rectosigmoid carcinoma does not jeopardise survival and disease control of patients. The justification for adoption of laparoscopic technique would depend on the perceived value of its effectiveness in improving short-term post-operative outcomes.
CONCLUSION:

Laparoscopic TME is a **feasible** but technically demanding procedure (12% conversion rate). This series confirms the safety of the procedure, while **oncologic results** are at present comparable to the open published series with the limitation of a short follow-up period. **Further studies** and possibly randomized series will be necessary to evaluate long-term clinical outcome in cancer patients.

N=50

CONCLUSION:

This study confirms our preliminary results of oncological feasibility of laparoscopic TME with sphincter preservation for mid and low rectal cancer, and showed that morbidity can be decreased by using a standardized surgical procedure.

N=32

CONCLUSION:
A laparoscopic approach can be considered in most patients with mid or low rectal cancer.

N=42

CONCLUSION:
Totally laparoscopic excision of the mesorectum is feasible in 50 percent of patients and where possible yields histologic parameters comparable to open surgery. Early survival and recurrence figures also appear to be comparable.

CONCLUSION:
Intraop and early postop, laparoscopic resection of rectal cancer in a selected cohort compares favorably with the open technique. Preliminary data appear to suggest that rectal cancer resection can be performed by laparoscopy in accordance with established principles of cancer therapy and that port-site metastases are not a relevant clinical problem. Prospective, randomized trials are required.
Common message

- Safe, feasible, equivalent operation
- Operative time longer
- Smaller incisions, less blood loss
- Postoperative recovery better
- But higher cost
- And more trials needed
Randomised controlled trials - Rectal Cancer

MRC Conventional versus laparoscopic-assisted surgery in colorectal cancer (MRC-CLASICC)

COST Study Group
Advances in Instrumentation
Exposure of pelvic operative field

Positioning
EndoPaddle retractor
Intravaginal retractor
Uterine suspension
Cotton tape encirclement
Perineal pressure
Hypogastric nerves

Nervi erigentes
Conclusion

We have to work harder so that patients heal better