Laparoscopic Surgery for Rectal Cancer

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
Short-term Quality-of-Life Outcomes Following Laparoscopic-Assisted Colectomy vs Open Colectomy for Colon Cancer
A Randomized Trial

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Although laparoscopic techniques were first described in 1901, 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 cholecystectomy in 1987 was followed by rapid widespread adoption of the procedure. 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.

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 exteriorized for resection and anastomosis. Laparoscopic-assisted colectomy has emerged as the preferred minimally invasive strategy for colonic cancer.

Context Laparoscopic-assisted colectomy (LAC) has emerged as the preferred minimally invasive surgical strategy for diseases of the colon. The safety and efficacy of LAC for colon cancer are unknown, and the nature and magnitude of any quality-of-life (QOL) benefit resulting from LAC for colon cancer is also unknown.

Objective To compare short-term QOL outcomes after LAC vs open colectomy for colon cancer.

Design, Setting, and Participants Multicenter, randomized controlled trial (Clinical Outcomes of Surgical Therapy [COST]). Between September 1994 and February 1999, 37 of 48 centers provided data for the QOL component of the trial for 449 consecutive patients with clinically resectable colon cancer.

Main Outcome Measures Scores on the Symptom Distress Scale (SDS), Quality of Life Index, and a single-item global rating scale at 2 days, 2 weeks, and 2 months postoperative; duration of postoperative in-hospital analgesic use; and length of stay.

Results Of 449 patients, 428 provided QOL data. In an intention-to-treat analysis comparing SDS pain intensity, SDS summary, QOL index summary, and global rating scale scores at each time point, the only statistically significant difference observed between groups was the global rating scale score for 2 weeks posturgery. The mean (median) global rating scale scores for 2 weeks posturgery were 76.9 (80) for LAC vs 74.4 (75) for open colectomy (P = .009). While in the hospital, patients assigned to LAC required fewer days of both parenteral analgesics compared with patients assigned to open colectomy (mean [median], 3.2 [3] vs 4.0 [4] days; P < .001) and oral analgesics (mean [median], 1.9 [1] vs 2.2 [2] days; P = .03).

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.
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, Salvador Deigado, Antoni Castells, Pilar Tañé, Josep M Piñol, Josep Vila

Summary

Background Although early reports on laparoscopy-assisted colectomy (LAC) in patients with colon cancer suggested that it reduced 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. Adjuvant 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 postoperative ileus times (p=0.001), and shorter hospital stays (p=0.005). Morbidity 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 recurrence (hazard ratio 0.39, 95% CI 0.19-0.82), death from any cause (0.48, 0.23-1.04), 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

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Cadaver model - laparoscopic rectal resection with TME and autonomic nerve preservation.

After proving feasibility in the cadaver model, a clinical study was performed on patients with mid to low rectal cancers. Acceptable morbidity with this minimally invasive technique of rectal resection and TME/ANP.

There is growing evidence that laparoscopic methods can be applied to patients with rectal cancer.

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

Patients in the laparoscopic group had a higher probability of 5-year survival than those who had open resection, but this difference was not significant. Those in the open resection group had a higher probability of being disease free at 5 years than those who had laparoscopy, but this difference was also not significant.

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.
Prospective Evaluation of Laparoscopic Surgery for Rectosigmoidal and Rectal Carcinoma.
Yamamoto et al. DCR 2002;45:1648-1654

N=70

CONCLUSION:
The findings of the present study demonstrate the feasibility and safety of laparoscopic surgery for selected patients with rectal carcinoma. Morbidity and mortality rates and oncologic outcome appear to be comparable with conventional surgery.

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

N=40

CONCLUSION:
Laparoscopically assisted rectal resection is associated with a higher rate of male sexual dysfunction, but not bladder dysfunction, compared with the open approach. This has implications, particularly for sexually active males with bulky or low rectal cancers, when deciding the best operative approach.
Randomised controlled trials

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
Laparoscopic Surgery for Rectal Cancer – Should we be doing it?

Laparoscopic Surgery for Rectal Cancer – Who should be doing it?
We have to work harder so that patients heal better