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This study compares the efficacy and safety of laparoscopic surgery (LS) and open surgery (OS) for colorectal cancer.

Methods:

An electronic search of the literature was undertaken to identify primary studies and systematic reviews. Information on the safety of LS versus OS was analysed. A meta-analysis was conducted to examine long-term outcomes.

Results:

A systematic review published in 2000 and 12 more recent randomized clinical trials were identified. Compared with OS, LS less loss and pain, and resulted in a faster return of bowel function and earlier resumption of normal diet. Hospital stay was up to after LS. No significant differences between the techniques were noted in the incidence of complications or postoperative mortality required to complete LS was significantly longer (0.5-1.0 h more). No significant differences were found between the two terms of overall mortality, cancer-related mortality or disease recurrence.

Conclusion:

LS takes longer than OS but offers several short-term benefits. However, complication rates are similar for both procedures; differences were found in long-term outcomes. Copyright © 2006 British Journal of Surgery Society Ltd. Published by John Wiley & Sons, Ltd.

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DIGITAL OBJECT IDENTIFIER (DOI)10.1002/bjs.5430 [About DOI](#)**ARTICLE TEXT****Introduction**



Colorectal cancer is the second leading cause of death from malignancy in the industrialized world, accounting for more than all cancer deaths. The only curative treatment is operative excision. Traditionally, this has involved open surgery (OS) and co resection of the primary tumour; however, since 1991 laparoscopic surgery (LS) has also been used in this context[1][2]. LS r performed intracorporeally or in a partly extracorporeal manner (laparoscopically assisted surgery).

Several studies have reported advantages of LS over OS in the treatment of colorectal cancer, such as a reduction in pain, m recovery of bowel function, shorter hospital stay and better cosmetic results[3-6]. Nevertheless, the effectiveness and safety (procedure have been the subject of debate, and its use is still not widespread. Doubts about the technique centre mainly on t with which tumour resection can be performed and the quality of the information obtained from the lymph nodes with respect staging (a problem of reduced visual field and impossibility of palpation). In addition, reports of port-site metastasis have incre about the safety of LS[6-8].

Most trials that have evaluated LS for colorectal cancer (many of which were non-randomized and with small sample sizes) h short-term outcomes; typically they have shown the technique to provide better results in terms of postoperative morbidity an variables. Long-term outcomes have never been evaluated rigorously in a systematic review as durations of follow-up have u been insufficient to allow a proper assessment of survival and disease recurrence. The National Institute for Clinical Excellen recommendations of 2000[9] concluded that LS should only be used in randomized control trial (RCT) or study settings.

Recently, a number of trials have been undertaken with longer follow-up times and larger sample sizes. These provide a bett evidence regarding the efficacy and safety of the new procedure than has hitherto been available. The aim of the present revi compare the safety and efficacy of LS in the treatment of colorectal cancer with those of OS. The techniques are also compar short- and long-term outcomes.

Methods



Search strategy

A systematic review of the scientific literature was performed Health technology assessments and systematic reviews were s the Health Technology Assessment database, the Cochrane Database of Systematic Reviews, and Database of Abstracts of Effects. Primary studies were searched for in the Medline, Embase, Cancerlit, Pascal Biomed and Cinahl databases. Trial req databases were also explored to retrieve results from ongoing clinical trials. The search terms used were (laparoscopic surge laparoscopy) and (colon tumour or rectal tumour or colorectal neoplasm). The last search was performed in November 2005. bibliographies of relevant articles were reviewed by hand to identify studies not retrieved by database exploration.

Inclusion criteria

Only RCTs or systematic reviews of RCTs published after 2000 were included in order to provide the highest level of scientifi those selected compared short- or long-term outcomes of LS or laparoscopically assisted surgery with OS in patients with ca colon or rectum. The short-term outcomes examined were related to the actual surgery (duration of operation, number of nod positive tumour margin, size of surgical wound, blood loss) and postoperative recovery (pain, time to food intake, time to bow to mobilization and length of hospital stay). The long-term outcomes examined were rate of disease recurrence, mortality, ove recurrence-free survival and metastasis. Studies with short- and long-term complication data were also included to assess the

Trials were excluded if they involved heterogeneous groups of patients with a variety of aggregated colorectal pathologies the the outcome solely of colorectal malignancy to be assessed. Studies describing the effects of treatment on the immune syste excluded.

Critical appraisal

Clinical trials were appraised by internal and external validity assessment using a checklist of factors, including randomizatio method of analysis and results obtained[10][11].

Data extraction and analysis

An evidence table was prepared including authors' names, year of publication and study design (sample size, follow-up, rand analysis performed), participant selection criteria, characteristics of the laparoscopic technique studied, patient baseline char short and long-term outcomes. With this information, a structured, qualitative synthesis of the evidence was undertaken, takin the efficacy, outcomes and complications mentioned in each study in the table[12].

Intention-to-treat analysis was performed, taking into account the number of patients assigned to receive LS who eventually r OS. For the assessment of long-term outcomes, a meta-analysis was conducted to quantify the efficacy of LS and OS. All cal performed using Review Manager 4.2 software. A random-effect model was used to avoid statistical heterogeneity. Finally, th reviewed externally by a specialist in digestive surgery with many years of experience in the treatment of colorectal cancer.

Results



A good-quality systematic review was published in 2000[13]; in order to update it only studies published after 2000 were included. A search detected 652 further references. Twelve RCTs met the inclusion criteria and were selected for analysis (Fig. 1). Nine (8) reported short- and/or long-term outcomes[14-22]. Three focused on safety[23], quality of life[24] or cost comparisons[25]. Four analysed only colonic cancer[16-18][20][23-25], two included rectosigmoidal carcinoma[14][15] and one examined rectal cancer. One study analysed the outcomes of surgery for colonic and rectal cancer separately[19], and another examined colonic and rectal cancer but did not analyse the outcomes separately[22] (Table 1).



Figure 1. Systematic review flow diagram in accordance with the QUORUM statement. RCT, randomized clinical trial; JCOG, Japan Clinical Oncology Group; COLOR, Colonic cancer Laparoscopic or Open Resection
[\[Normal View 35K\]](#) [\[Magnified View 65K\]](#)

Table 1. Characteristics of the studies included in the review

Reference	Year	N ^a	Follow-up	Laparoscopic technique	Pathology	Outcomes
Guillou <i>et al.</i> [19] (CLASICC study)	2005	794	3 months	Laparoscopically assisted colectomy	Colonic or rectal cancer	Short-term outcomes Quality of life
COLOR[20]	2005	1082	-	Laparoscopically assisted colectomy	Colonic cancer	Short-term outcomes
Janson <i>et al.</i> [25] (Part of COLOR)	2004	210	12 weeks	Laparoscopically assisted colectomy	Colonic cancer	Costs
Leung <i>et al.</i> [14]	2004	403	5 years	Laparoscopically assisted colectomy	Rectosigmoidal carcinoma	Short- and long-term outcomes
STSG[18] (COST study)	2004	863	4.4 years (efficacy) 18 months (complications)	Laparoscopically assisted colectomy	Adenocarcinoma of the colon	Short- and long-term outcomes
Zhou <i>et al.</i> [21]	2004	171	1-16 months	Total mesorectal excision with anal sphincter preservation	Rectal adenocarcinoma	Short- and long-term outcomes
Hasegawa <i>et al.</i> [15]	2003	50	20 months	Laparoscopically assisted colectomy	Colorectal cancer T2°-T3	Short-term outcomes
Lacy <i>et al.</i> [16]	2002	219	43 months	Laparoscopically assisted colectomy	Colonic adenocarcinoma	Short- and long-term outcomes
Weeks <i>et al.</i> [24] (part of COST)	2002	449	2 months	Laparoscopically assisted colectomy	Colonic adenocarcinoma	Quality of life
Winslow <i>et al.</i> [23]	2002	83	30 months	Laparoscopically assisted colectomy	Colonic adenocarcinoma	Wound complications
Ordemann <i>et al.</i> [22]	2001	40	30 days	Intracorporeal resection	Colorectal cancer	Complications
Curet <i>et al.</i> [17]	2000	43	4-9 years	Laparoscopically assisted colectomy	Colonic cancer	Short- and long-term outcomes

CLASICC, Conventional versus Laparoscopic-Assisted Surgery in patients with Colorectal Cancer; COLOR, Colonic cancer Laparoscopic or Open Resection; STSG, Surgical Therapy Study Group; COST, Clinical Outcomes of Surgical Therapy.

