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[Intervention Review]

Curative surgery for obstruction from primary left colorectal carcinoma: Primary or staged resection?

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ABSTRACT

Background

In 8 to 29% of patients with colorectal carcinoma, obstruction is the main symptom at diagnosis, and 85% of patients undergoing emergency colorectal surgery have obstruction from colorectal carcinoma. The prognosis of patients who undergo emergency surgery for obstruction is often poor. So far, two types of surgical approach have been used for this condition: primary resection (primary anastomosis or Hartmann's procedure) with simultaneous treatment of carcinoma and obstruction, or staged resection (treatment of the obstruction prior to resection).

However, neither strategy has been found to have any advantages over the other.

Objectives

To ascertain whether primary resection in patients with obstruction from left colorectal carcinoma has advantages over staged resection in terms of morbidity and mortality.

Search methods

Electronic database searches of Cochrane Controlled Trials Register, Medline, Cancerlit, Embase. Hand searching of the most important journals in the fields of oncology and surgery from 2003 and onward until the time of writing.

Selection criteria

Randomised Clinical Trials (RCT) and Controlled Clinical Trials (CCT), in which a group of patients who undergo primary resection for intestinal obstruction from left primary colorectal carcinoma is compared with a group of patients who undergo staged resection for the same condition. Since only one study of this type was available, we considered all other studies, except for case-controls, on the basis of the best possible available evidence.

Studies were considered without language restrictions.

Data collection and analysis

Two reviewers (GLDS, CG) examined all the citations and abstracts derived from the electronic search strategy. Reports of potentially relevant trials were retrieved in full. Both reviewers independently applied the selection criteria to trials reports. Reviewers were not blind to the names of institutions, journals or authors of trials. A third opinion (SP, ML) was obtained to resolve disagreements.

Main results

We identified 2043 citations: Medline 1205, Embase 635, Cancerlit 203. One study for potential inclusion was identified, but was then excluded (Kronborg 1995).

Authors' conclusions

The limited number of identified trials together with their methodological weaknesses do not allow a reliable assessment of the role of either therapeutic strategy in the treatment of patients with bowel obstruction from colorectal carcinoma. It would appear advisable to conduct high quality large scale RCT to establish which treatment is more effective. However, it is doubtful whether they could be carried out in a timely and satisfactory way in this particular surgical context.

PLAIN LANGUAGE SUMMARY**Curative surgery for obstruction from primary left colorectal carcinoma: Primary or staged resection?**

No strong evidence about whether removal of bowel obstruction and cancer should be done in one step or as a staged procedure, when people have cancer in the left colon. Colorectal (bowel) cancer is common. It can obstruct the bowel, causing severe dilation of the intestine and the stomach, pain and vomiting. Surgery is used to try to remove the obstruction, as well as the cancer. When the cancer is in the right colon, the obstruction and cancer are usually removed simultaneously. If the cancer is in the left colon or in the rectum, however, it may be better for the patient to have the obstruction and the cancer removed in separate surgical procedures.

This review found no evidence in comparative trials indicating which of these techniques is preferable for people with cancer in the left colon. More research is therefore needed.

BACKGROUND

In Western countries, the incidence of colorectal carcinoma is second only to carcinoma of the lung in men and the breast in women (Black 1997, Beart 1992). Each year this disease causes 15,000 deaths in Italy (Capocaccia 1997, Capocaccia 1993), and 200,000 deaths overall in Europe and in the U.S.A. (Midgley 1999).

In 8 to 29% of patients with colorectal carcinoma, obstruction is the main symptom at diagnosis (Ohman 1982, Setti Carraro 2001), and 85% of patients who undergo emergency colorectal surgery have obstruction from colorectal carcinoma (Carty 1992). Elderly patients undergo emergency surgery for obstruction from colorectal carcinoma more often than younger patients (Anderson 1992). The risk of obstruction, which varies depending on the tumor site, is about 50% in tumors of the splenic flexure and 25% in those of the descending colon (Ohman 1982, Phillips 1985, Fielding 1974, Welch 1974).

The prognosis of patients who undergo emergency surgery for obstruction is poorer than that of patients who undergo elective surgery, with a higher rate of postoperative and long-term morbidity (Ohman 1982, Umpleby 1984, Fielding 1974, Runkel 1991, Runkel 1998). The higher postoperative mortality rate appears to be mainly linked to the increased surgical risk present in emergency conditions. The physical status of patients referred for surgery for obstruction is often poor, due to tumor growth and hydroelectrolytic imbalance caused by the obstruction which, moreover, exacerbates any underlying disease (e.g. hypertension, diabetes, heart and lung disease). The poor long-term survival rate in this category appears to be linked to more than one factor: greater biological aggressiveness of the tumor, prevalence of advanced disease with a consequent reduction in the rate of "curative" resections and/or delayed tumor removal because staged resection is used.

It is widely agreed that for obstruction from primary right colon carcinoma, resection (right hemicolectomy) should be performed with anastomosis in one stage (Phillips 1985, Carty 1992, Runkel 1991, Irvin 1977, Fielding 1979).

Also for obstruction from primary carcinoma of the left colon or rectum, the more widely used surgical approach is primary resection, with simultaneous treatment of carcinoma and obstruction. To achieve this, some surgeons remove only the diseased tract (segmental resection/hemicolectomy), while others prefer to remove the entire dilated colon up to the ileo-cecal valve (subtotal/total colectomy), creating an ileo-sigmoid, ileo-rectal or ileo-anal anastomosis.

However, the advantages of primary resection for obstruction from primary left colon or rectal carcinoma have yet to be proven. Some surgeons prefer staged resection, first operating on the obstruction, and postponing radical surgery. At the first stage, a colostomy is created to resolve the obstruction, and at the second, performed a few weeks later, the tumor is resected, intestinal continuity restored, and the colostomy closed. Colostomy closure can also be undertaken at a third operation.

The main advantage of staged resection is that it minimizes surgical trauma, which is of particular importance in patients whose general condition is often precarious (Sommeling 1997), and reduces the risk of contamination due to unprepared bowel. High mortality

rates have been reported following primary resection in emergency conditions, ranging from 23 to 50% (Phillips 1985, Garci-Valdecacas '91, Setti Carraro 2001, Welch 1974, Irvin 1977).

Those in favor of primary resection sustain that its overall postoperative mortality is comparable to that of the two or three operations involved in staged resection (Umpleby 1984, Serpell 1989, Deans 1994, Tan 1995) and, above all, that its five-year survival rate is markedly higher (Fielding 1974, Irvin 1977, Vidger 1985) because primary resection can prevent both dissemination from surgical manipulations and tumor growth during the interval between one procedure and another (Fielding 1974). Other authors, however, disagree with this view (Ohman 1982, Phillips 1985, Welch 1974).

One randomized trial which appeared as an interim report in 1986 (Kronborg 1986) and as final results in 1995 demonstrated that the only advantage of primary over staged resection was that it incurred a shorter hospital stay (Kronborg 1995).

The aim of our review is therefore to ascertain and compare the impact of each surgical strategy on short and long-term survival.

OBJECTIVES

A systematic research will be made of data in literature in order to ascertain whether primary resection (and what type of primary resection, i.e. primary anastomosis or Hartmann's procedure) in patients with obstruction from left colorectal carcinoma has advantages over staged resection in terms of morbidity and mortality.

METHODS

Criteria for considering studies for this review

Types of studies

Randomized Controlled Trials (RCT) and Controlled Clinical Trials (CCT), in which the outcome of a group of patients who undergo primary resection for intestinal obstruction from left primary colorectal carcinoma is compared with that of a group of patients who undergo staged resection for the same condition. If studies of this type are not available, we will consider other studies on the basis of the best possible available evidence except for case-control studies.

Studies were considered without language restrictions.

Types of participants

Patients of all ages who undergo emergency surgery for obstruction from primary left colorectal carcinoma. In these patients, curative surgery must seem achievable, with complete tumour removal without local macroscopic residual disease, or distant metastasis. As the analysis of data will be conducted according to the principle of the intention to treat, the patients included in the staged resection group will not be excluded from the study if at second operation the curative surgery planned is no longer feasible, or if they die before the second operation.

As diagnostic criteria have not yet been standardized, a diagnosis of intestinal occlusion will be considered valid if based on one, or both, of the following:

- 1) severe colonic distention with fecal and gas obstruction, often accompanied by persistent vomiting;

2) colonic distention and air-fluid levels at plain abdominal x-ray.

The left colon includes the left side of the transverse colon. Any intraoperative diagnosis of occlusion from colorectal carcinoma must be confirmed by histology. The surgical procedure is considered emergency if performed within 24 hours of admission.

Types of interventions

1) Primary resection, consisting of "curative" resection in emergency conditions. The operation can consist of a colic segmental resection (left hemicolectomy, sigmoid colectomy or anterior resection of the rectosigmoid), or a subtotal or total colectomy. These patients are divided into two groups, depending on whether intestinal continuity is restored simultaneously (primary anastomosis) or deferred (Hartmann's procedure); 2) Staged resection, consisting of colostomy or ileostomy to resolve the obstruction as a first step, during exploratory laparotomy which allows an evaluation of the possibility of performing curative resection. This procedure is followed by colorectal resection, which is usually performed at a distance of two weeks, or more.

Types of outcome measures

1) Postoperative complications that are medical (e.g. cardiac, respiratory, renal, vascular) and surgical (e.g. anastomotic dehiscence with fistula and/or abscess formation, re-operation).
 2) Overall hospital stay (i.e. in relation to the different admissions).
 3) Postoperative mortality (i.e. by the 30 th postoperative day); for surgical procedures involving two stages or more we will consider mortality stage by stage.
 4) Long-term survival, which will be evaluated in relation to each disease stage (Dukes' classification).
 5) No ostomy closure (even if this cannot strictly be considered a complication, it permanently compromises quality of life).

Search methods for identification of studies

The following bibliographic databases were examined January 2004:

- Cochrane central register of controlled trials (CENTRAL)
- CCG specialised register
- MEDLINE (since 1966)
- EMBASE (since 1980)
- CANCERLIT (since 1984)

The following search strategy were used for the MEDLINE database:

- # 1. "Colorectal Neoplasms" / all subheadings
- # 2. "Rectal Neoplasms" / all subheadings
- # 3. "Colonic Neoplasms" / all subheadings
- # 4. #1 or #2 or #3
- # 5. "Surgery"
- # 6. "Emergency"
- # 7. "Intestinal Obstruction"/all subheadings
- # 8. #6 or #7
- # 9. #4 and #5 and #8

The following search strategy were used for the EMBASE database:

- # 1. "Colon-tumor" / all subheadings
- # 2. "Colon-cancer" / all subheadings
- # 3. "Colon-carcinoma" / all subheadings
- # 4. "Colon-adenocarcinoma" / all subheadings

- # 5. "Rectum-tumor" / all subheadings
- # 6. "Rectum-carcinoma" / all subheadings
- # 7. "Rectum-cancer" / all subheadings
- # 8. #1 or #2 or #3 or #4 or #5 or #6 or #7
- # 9. "Surgery"
- # 10. "Emergency" / all subheadings
- # 11. "Ileus" / all subheadings
- # 12. " Intestine-obstruction" / all subheadings
- # 13. " Colon-obstruction" / all subheadings
- # 14. #10 or #11 or #12 or #13
- # 15. #8 and #9 and #14

The following search strategy were used for the CANCERLIT database:

- # 1. "Colonic-Neoplasm" / all subheadings
- # 2. "Rectal-Neoplasm" / all subheadings
- # 3. "Colorectal-Neoplasm" / all subheadings
- # 4. #1 or #2 or #4
- # 5. "Intestinal-Obstruction" / all subheadings
- # 6. "Surgery"
- # 7 #6 and #5 and #4

The more recent literature (2003) will be retrieved by handsearching in the more important journals in the fields of oncology and surgery. The bibliography for the studies included in the review will be evaluated (according to title) so as to make the research more comprehensive.

Data collection and analysis

Two reviewers (GLDS, CG) examined all the citations and abstracts derived from the electronic search strategy. Reports of potential relevant trials were retrieved in full. Both reviewers independently applied the selection criteria to trials reports. Reviewers were not blind to the names of trials' authors, institutions or journals. Disagreements were discussed with Dr Pucciarelli and Prof. Lise, and resolved.

RESULTS

Description of studies

Since the first analysis retrieved only one RCT, by Kronborg, and which appeared in 1995 ([Kronborg 1995](#)), we decided to re-review all abstracts and examine studies comparing outcomes following primary and staged resection. The aim of this second search was to evaluate whether it was possible to obtain relevant information for scientific research or clinical practice without performing a meta-analysis.

This search led to the identification of five further papers: one prospective study ([Fielding 1979](#)) and four retrospective cases series ([Tan 1995](#), [Mochizucki 1993](#), [Feng 1987](#), [Huddy 1988](#)). All other papers were excluded because: no distinction was made between patients who underwent emergency or elective surgery; patients with carcinoma in any site of the colon were considered overall; the authors gave no definition for staged and/or primary resection.

Although Kronborg's study was an RCT, it contained no prior sample size estimation or description of the standard treatment. The type of random procedure used was not specified and the accrual period (15 yrs) was very long. Moreover, no information was given regarding the number of excluded patients or the reason for their exclusion and, although one of the most important

inclusion criteria was the presence of colorectal carcinoma, 14% of randomised patients were later considered ineligible because during or after surgery they were found to have no malignant tumour. Furthermore, since the long-term outcome of patients was not adequately recorded, a comparison between the two groups was unreliable. We therefore believe that Kronborg's study should be viewed with caution (Chalmers 1981). No further information was requested from the author since this was the only RCT retrieved, and a meta-analysis would not have been feasible.

Although our protocol stated that the surgical procedure would be defined as "emergency" if carried out within 24 hours of admission, neither Kronborg nor the authors of the other five papers specified that this consideration was made. In our opinion, this was not relevant since in all cases, except that described by Mochizuki, the diagnosis of intestinal obstruction was in agreement with the definition specified in our protocol.

The main methodological caveat in the five non-RCT studies was the allocation of treatment. In all five papers, the treatment for each patient was chosen by the surgeon at the moment of surgery, thus creating an evident bias in the evaluation of final results. In addition, minor methodological problems were that a small number of patients were enrolled in the trial, and no histological diagnosis of disease was available.

Risk of bias in included studies

No trials were included.

Effects of interventions

The electronic database searches (January 2004) yielded a total of 2043 citations:

-Medline: 1205
 -Embase: 635
 -Cancerlit: 203

From these, one study for potential inclusion was identified, but was later excluded.

Summary of analyses: Not available for this review

DISCUSSION

The adequate treatment of patients with intestinal obstruction from primary left colon carcinoma is an important issue in surgery. Although the medical literature contains a substantial number of studies on this topic, few papers compare outcomes following the

different therapeutic surgical strategies available. Moreover, in view of the lack of reliable studies, it appears inappropriate to carry out a meta-analysis in order to compare the short and long-term outcomes of patients who undergo primary and staged resection for obstruction from left colorectal carcinoma.

The paucity of RCT may be due to: difficulty in obtaining informed consent from patients presenting with a poor performance status and in a critical condition, problems in making an accurate diagnosis in order to verify patients' eligibility, differences in the impact on quality of life depending on whether colostomy is used or not, diversity in surgeons' skills and their preference for one of the two techniques, novel endoscopic procedures used for resolving obstruction (e.g. laser, stent), and the complex logistic organisation of such studies. Some surgical problems are therefore a difficult matter to deal with satisfactorily in RCT.

The two alternative strategies considered in this review have various advantages and disadvantages, and they may have different impacts on overall survival and quality of life.

However, as yet in the literature there is little information on which therapeutic approach is preferable for patients with obstruction from primary left colorectal carcinoma.

AUTHORS' CONCLUSIONS

Implications for practice

It is not possible to draw conclusions pertinent to surgical practice due to the small number of randomised studies available in the literature.

Given the lack of trial-based evidence, individual surgeons should be encouraged to enrol their patients in randomised controlled trials whenever possible.

Implications for research

Although most surgeons appear to prefer primary resection, it has not yet been established which treatment is more effective in patients with obstruction from primary left colon carcinoma. Large scale RCT appear warranted to conclusively establish which surgical procedure is preferable. However, the variables involved in the treatment of obstructive left colon cancer are so numerous that it is doubtful whether such trials could be conducted in a satisfactory and timely way in this particular surgical context.

ACKNOWLEDGEMENTS

The reviewers wish to thank Ms Sara Pearcey for her help in correcting the English language.

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Welch 1974

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CHARACTERISTICS OF STUDIES

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Kronborg 1995	No information on sample size, or description of the standard treatment. Method of randomisation was not specified. Period of measuring (15 yrs) was very long. Moreover, no information was given regarding the number of excluded patients or the reason for their exclusion.

WHAT'S NEW

Date	Event	Description
10 April 2015	Review declared as stable	Editorial decision to park this review, due to lack of trials to support. None of the performed searches after publication have revealed any new trials. If any new identified trial is found eligible for inclusion, an update will be considered.

HISTORY

Protocol first published: Issue 2, 2000

Review first published: Issue 1, 2002

Date	Event	Description
23 July 2008	Amended	Converted to new review format.
6 February 2004	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

Gian Luca De Salvo performed the literature search, examined all the citations and abstracts, and drafted the review.

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Cecilia Gava examined all the citations and abstracts.

Salvatore Pucciarelli solved the disagreements between Gian Luca De Salvo and Cecilia Gava and provided his clinical expertise in evaluating the studies.

Mario Lise conceived the study and drafted the review

DECLARATIONS OF INTEREST

There are no conflicts of interest relating to this review

SOURCES OF SUPPORT

Internal sources

- Centro Oncologico Regionale di Padova, Italy.

External sources

- No sources of support supplied

INDEX TERMS

Medical Subject Headings (MeSH)

Colorectal Neoplasms [complications] [*surgery]; Digestive System Surgical Procedures [methods]; Intestinal Obstruction [etiology] [*surgery]

MeSH check words

Humans