Laparoscopic reversal of Hartmann's procedure

Peter Olsen Svenningsen[1], Orhan Bulut[1] & Per Jess[2, 3]

ABSTRACT

INTRODUCTION: A change in procedure from open to laparoscopic reversal of Hartmann's colostomy was implemented at our Department between May 2005 and December 2008. The aim of the study was to investigate if this change was beneficial for the patients.

MATERIAL AND METHODS: The medical records of all patients who underwent reversal of a colostomy after a primary Hartmann's procedure during the period May 2005 to December 2008 were reviewed retrospectively in a case-control study.

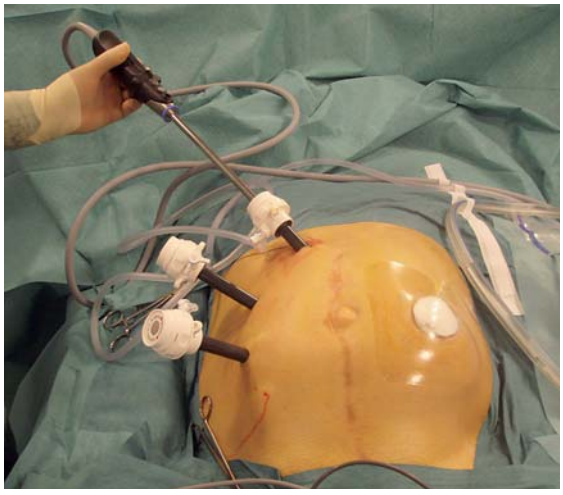
RESULTS: A total of 43 patients were included. Twenty-one had a laparoscopic and 22 an open procedure. The two groups matched with regard to age, sex, American Society of Anaesthetists (ASA) score, body mass index and indication for Hartmann's operation. A significantly longer operation time was found for laparoscopic than for open surgery (median 285 versus 158 minutes, $p < 0.001$), but with less blood loss (median 100 versus 600 ml, $p < 0.001$), faster return of bowel function (median three versus four days, $p < 0.01$) and shorter postoperative hospitalization (median four versus six days, $p < 0.01$). No intraoperative complications occurred. One laparoscopic operation was converted (5%). There was no difference in postoperative complications between the two groups (10 versus 14%), and no anastomotic leaks. The total mortality was 2% as one patient died postoperatively after an open operation.

CONCLUSION: It is possible for trained laparoscopic colorectal surgeons to perform laparoscopic reversal of Hartmann's procedure as safely as in open surgery and with a faster recovery, shorter hospital stay and less blood loss despite a longer knife time. It therefore seems reasonable to offer patients a laparoscopic procedure at departments which are skilled in laparoscopic surgery and use it for standard colorectal surgery.

Hartmann's operation is a common procedure for left colonic pathology, especially in emergency surgery such as perforated diverticulitis, perforated sigmoid cancer or after iatrogenic perforation of the sigmoid [1-3]. Reversal of Hartmann's colostomy is a major abdominal operation which is considered a high-risk procedure (**Figure 1**). Nevertheless, many patients wish to have the colostomy reversed for social, psychological, aesthetic or practical reasons. The rate of reversal has been reported to range from 52% to 60% only, as the patients are often older with more co-morbidity than the average population [4-6]. For these elective operations, the reported mortality rates reach 10%, anastomotic leakage rates reach 15%, and morbidity rates range from 30% to 40% [2, 7]. Introducing a minimal invasive method such as the laparoscopic procedure seems to improve these figures [8, 9]. At the Department of Colorectal Surgery, Hillerød Hospital, a change in the procedure from open to laparoscopic reversal of Hartmann's colostomy was implemented from May 2005, and the aim of the present study was to investigate if this change was beneficial to the patients.

FIGURE 1

Port placement in reversal of Hartmann's procedure.



MATERIAL AND METHODS

The study was performed as a retrospective case-control study at the Department of Colorectal Surgery, Hillerød Hospital. The medical records of all patients who underwent reversal of a colostomy during the period from May 2005 to December 2008 were reviewed. Only closures of Hartmann's procedures were included in the study. Forty-three patients were found. Twenty-one were operated by laparoscopic surgery (LS) and 22 by open surgery (OS).

The following variables were analyzed: age, gender, operative procedure, co-morbidity, American Society of

ORIGINAL ARTICLE

1) Department of Colorectal Surgery, Hillerød Hospital, Denmark,
2) Department of Surgery, Roskilde Hospital, Denmark, and
3) University of Copenhagen, Denmark

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Anesthesiologists (ASA) score, Body Mass Index (BMI), indication for Hartmann's operation, time from primary operation to reversal, length of the rectosigmoid stump, operation time, estimated blood loss, early complications (within 30 days after the operation) including anastomotic leakage, time to flatus, time to defaecation, duration of hospital stay, mortality and reoperation within 30 days postoperatively. The procedures were all performed by colorectal surgeons. The laparoscopic procedures were done by trained laparoscopic surgeons. The anastomoses were all stapled with a circular stapler, except two which were hand sewn: one in the laparoscopic group, where the operation was converted because of a tear in the rectum, and one in the open group with a long distal stump (80 cm).

TABLE 1

Patient characteristics.

	Laparoscopic surgery (n = 21)	Open surgery (n = 22)	p-value
Age, years, median (range)	61 (26-79)	55 (34-79)	0.76
Female/male, n	13/11	9/10	0.45
ASA score, median (range)	2 (1-2)	2 (1-2)	0.19
BMI, kg/m^2, median (range)	23 (19-31)	30 (22-35)	0.08
Indications for primary operation			0.48
Iatrogenic perforation	4	5	
Cancer obstruction	3	6	
Diverticulitis	13	10	
Gynaecologic disease	1	1	
Median time to reversal, days (range)	180 (90-390)	270 (120-900)	0.009*
Median length of rectosigmoid stump, cm (range)	20 (12-40)	20 (12-80)	0.58

*) Statistically significant.

TABLE 2

Operation time, splenic flexure loosening, blood loss, postoperative complications, postoperative 30-day mortality, time for flatus and defecation and length of postoperative hospital stay in patients with laparoscopic versus open reversal of Hartmann's procedure.

	Laparoscopic surgery (n = 21)	Open surgery (n = 22)	p-value
Median knife time, min. (range)	285 (120-360)	157 (90-300)	< 0.001*
Median blood loss, ml (range)	100 (50-2,200)	600 (300-1,800)	< 0.001*
Postoperative complications, n (%)	2 (10)	3 (14)	0.7
Postoperative 30-day mortality, n (%)	0 (0)	1 (5)	0.5
Median time for flatus, days (range)	2 (1-5)	2 (1-6)	0.6
Median time for defecation, days (range)	3 (1-6)	4 (2-6)	< 0.01*
Median postoperative hospital stay, days (range)	4 (2-21)	6 (3-12)	< 0.01*

*) Statistically significant.

STATISTICAL ANALYSIS

Data were analyzed using non-parametric statistics, including χ^2 test and Mann-Whitney test. The level of significance was set to 5%.

RESULTS

The two groups were comparable with regard to age, sex, ASA score, BMI, indications for Hartmann's operation and median length of the rectal stump (**Table 1**). The median time from the primary operation to reversal of the colostomy was significantly longer in the OS group. We found no obvious reason for this. The most common indications for the primary operation were sigmoid diverticulitis, followed by iatrogenic perforation and cancer.

The perioperative data are shown in **Table 2**. The knife time was significantly longer for LS than for OS, though there was no difference in the share of patients in the two groups who had the splenic flexure taken down. No perioperative complications occurred in either of the two groups. One laparoscopic operation was converted (5%, 95% confidence limits: 0.1-24%). This patient was the only patient who had a reoperation due to wound rupture. The blood loss was significantly lower in LS than in OS. Postoperative complications were distributed equally in the two groups with two of 21 LS patients (10%, 95% confidence limits: 1-30%) and three of 22 OS patients (14%, 95% confidence limits: 3-35%) suffering such complications. There were no anastomotic leaks. One patient in the open group died due to aspiration to the lungs five days postoperatively. Consequently, the total mortality was 2% (95% confidence limits: 1-12%). the median time to flatus was two days for both LS and for OS, while a significant difference was found in the median time to postoperative defaecation (three versus four days). Median hospital stay after operation was significantly shorter for LS than for OS (four versus six days).

DISCUSSION

No randomized study of open versus laparoscopic reversal of Hartmann's procedure exists, but the few comparative studies were reviewed in a recent paper [10]. The eight reviewed studies comprised 450 patients with 193 patients in the laparoscopic group and 257 in the open group. The results showed that laparoscopic

surgery was as safe as open surgery and produced a significantly reduced complication rate, intraoperative blood loss and hospital stay.

In the present study, no statistically significant differences were observed in the characteristics of the two patient groups. BMI was slightly lower in the laparoscopic group which is probably an indication of selection of the patients for this procedure. This seems unnecessary, as it was demonstrated that with sufficient experience, laparoscopic colorectal surgery in obese patients is feasible and safe, offering all the benefits of a minimally invasive procedure [11].

There were no peroperative complications in either of the two groups, but knife time was significantly longer in the laparoscopic group, a result which is in accordance with large randomized studies of LO and OS for colon cancer [12]. In published studies of more than 15 cases of laparoscopic Hartmann's reversal, the conversion rate was between 10 and 20% [12] compared with only 5% in the present study, which may partly explain the relatively long laparoscopic knife time found in the present study. In accordance with the studies included in the above mentioned review [10], a significantly reduced intraoperative blood loss was found in the laparoscopic group as well as a reduced length of postoperative hospital stay. In contrast to previous studies [10, 13], we found no difference in the postoperative complication rate in favour of LS, probably due the small number of patients analysed. The total mortality rate of 2% was low compared with that of other studies [2, 7] and it is noteworthy that mortality was 0% in the laparoscopic group.

Although there are some limitations to the present study resulting from its nonrandomized and retrospective design, we conclude that it seems probable that trained laparoscopic colorectal surgeons may perform laparoscopic reversal of Hartmann's procedure as safely as in open surgery while achieving faster recovery, shorter hospital stay and less blood loss despite a longer knife time. It therefore seems reasonable to offer patients a laparoscopic procedure at departments which are skilled in laparoscopic surgery and use it for standard colorectal surgery.

CORRESPONDENCE: *Per Jess,* Department of Surgery, Roskilde Hospital, 4000 Roskilde, Denmark. E-mail: pjss@regionsjaelland.dk
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