

Laparoscopic or open hemicolectomy for elderly patients with right colon cancer? A retrospective analysis

F. GUIDA, M. CLEMENTE, L. VALVANO, C. NAPOLITANO

SUMMARY: Laparoscopic or open hemicolectomy for elderly patients with right colon cancer? A retrospective analysis.

F. GUIDA, M. CLEMENTE, L. VALVANO, C. NAPOLITANO

Aim. The aim of this study was to compare the short-term surgical outcomes of laparoscopically-assisted right hemicolectomy (LRH) and open right hemicolectomy (ORH) in elderly patients.

Patients and methods-Results. Seventy-five patients underwent right hemicolectomy for cancer during the study period, with 41 patients aged ≥ 70 years old. Twenty-four patients underwent ORH and seventeen patients had a LRH (58% vs 42%). We found no differences

between ORH and LRH in terms of mean operative time :89,5 minutes in open vs 80 minutes in laparoscopic group and return of bowel function (2,76 vs 2,54 days). Also the length of hospital stay did not differ significantly between the two groups (8,5 days in ORH vs 7 days in LRH – p 0,06). Postoperative morbidity was higher in ORH (25% vs 5%) though not statistically significant and the incidence of anastomotic leakage was similar between the two groups (8% vs 5%).

Conclusion. Laparoscopic RH in an elderly population is feasible and safe. However, we found no evidence to suggest that it is better than open RH and think that the decision regarding the method of operation should reflect surgeon expertise, patient co-morbidities and the necessity to perform extended resections.

KEY WORDS: Right colon - Cancer - Elderly - Laparoscopy.

Introduction

Nowadays we are observing an increased number of elderly patients presenting with colorectal cancer requiring surgical management.

Laparoscopic colorectal surgery has been shown in many studies to be associated with better perioperative outcomes when compared to open colorectal surgery with reported advantages including less analgesic requirements, earlier return of bowel function, as well as shorter hospital stay (1, 2).

Laparoscopic colectomy in the elderly has also been shown to be safe, however it is unknown whether elderly patients gain the same benefits from laparoscopic colectomy that younger patients.

In addition, right hemi-colectomy does not involve the mobilisation of splenic flexure and can often be completed through a small transverse incision and this can

provide benefits in terms of ease of operation, reduced postoperative pain, earlier return of bowel function and more rapid discharge from hospital (5).

Concern regarding laparoscopic colectomy in the elderly population also relates to the age-associated increase in co-morbidities, the significantly longer operative times, and the physiologic effects that prolonged time under anaesthesia have upon the multiple co-morbid conditions of these patients (6).

The aim of this study was to compare the short-term surgical outcomes of laparoscopically-assisted right hemicolectomy (LRH) and open right hemicolectomy (ORH).

Patients and methods

All patients undergoing a right hemicolectomy for cancer in “San Giovanni di Dio e Ruggi d’Aragona” Salerno Hospital, Department of Oncological and Mini-invasive Surgery, between January 2007 and December 2012 were included in the study.

Data were collected in a schedule indicating:

1. *Demographic data:* age, sex, tumoral stage
2. *Clinical data:* ASA score, previous abdominal surgery,

Department of Oncological and Mini-invasive Surgery,
“San Giovanni di Dio e Ruggi d’Aragona” Hospital, Salerno, Italy

Corresponding author: Francesco Guida, e-mail: francescoguida83@alice.it

© Copyright 2015, CIC Edizioni Internazionali, Roma

length of hospital stay, return of bowel function, post-operative morbidity (anastomotic leakage, occlusion, abdominal abscess, surgical site infection), perioperative and in-hospital mortality, extended resections.

3. *Operative data:* type of procedure (LRH/ORH), type of anastomosis (manual/mechanical, side-to-side/end-to-side), mean operative time, laparotomic conversion, reoperation.

Details of the operative procedure are described: all patients were administered prophylactic antibiotics at induction. With LRH a three port medial to lateral dissection was performed with high ligation of the ileocolic pedicle. The specimens were extracted through a subxyphoid incision. In all cases an extracorporeal anastomosis was performed. A wound protector was used in all cases. An ORH was performed through a transverse muscle cutting incision whenever possible. A midline incision was considered if previous laparotomy was present. A medial to lateral approach with high ligation of the ileocolic pedicle was performed routinely. With both techniques either a side-to-side ileocolic anastomosis or an end-to-side anastomosis was performed at the surgeon's discretion. Drains were not used routinely. No nasogastric suction was positioned after the intervention.

All procedures were performed by a single surgeon.

As described in other studies evaluating the risks of mortality after colorectal surgery (7, 8), we have used the age of 70 years as our cut-off to define "elderly" patients.

Statistical analysis

Data were processed using the Statistical Package for Social Sciences, version 18.0 (SPSS, Inc., Chicago, IL, United States, 2010). Qualitative variables were summarized by frequency and percentage, while non-normally distributed quantitative variables were described by the median and range. Student's t-test and Fischer's exact test as appropriate. Statistical significance was determined ($P < 0.05$).

Results

Seventy-five patients underwent right hemicolectomy for cancer during the study period, with 41 patients aged ≥ 70 years old: twenty patients were female and twenty-one male. Twenty-four patients underwent ORH and seventeen patients had a LRH (58% vs 42%). Eight patients in ORH group had extended resections to abdominal wall, bladder, small intestine and liver to obtain R0 resection. In LRH one patient underwent associated cholecistectomy for symptomatic lithiasis.

Data are shown in Table 1: no significant differences are present between the two groups and also the sta-

TABLE 1 - DEMOGRAPHIC DATA.

Sex (M/F)	ORH (n=24)	LRH (n=17)
	12/12	9/8
Cancer stage		
0	0	1
I	3	2
II	6	3
III	13	11
IV	2	0

ges of disease are similarly distributed. In ORH group 33% of patients had a previous abdominal surgery and in LRH group 11%. Only one patient required conversion to open surgery for bleeding control.

ASA score was not different between patients undergoing ORH or LRH: only, in ORH there was a greater number of patients with preoperative ASA IV score (9 vs 2 - $p=0,06$). Mean operative time did not differ significantly between the two groups: 89,5 minutes in ORH (60-150) and 80 minutes in LRH (70-100); also if the difference is not statistically significant, the longer duration of ORH probably reflects the number of extended resections performed in open procedure respect to the laparoscopic route (33% in ORH vs 5% in LRH - $p 0,03$).

The incidence of postoperative morbidities was 25% of open procedures and 5% of laparoscopic procedures. We registered in the ORH two anastomotic leakage (8% ORH vs 5% LRH), an intestinal occlusion that required re-interventions and an intra-abdominal abscess that was treated conservatively with antibiotic and percutaneous drainage. Only one patient presented anastomotic leakage in LRH group and this also required a laparotomic re-exploration. One patient died during the postoperative period in the ORH group due to massive pulmonary embolism.

Respect to the type of anastomoses we observed no differences in side-to-side anastomosis between ORH and LRH (9 vs 11), while the number of end-to-side anastomoses was significantly different between the two groups: 8 ORH and 1 LRH ($p=0,04$).

Analyzing the cases of anastomotic leakage and intestinal occlusion in the ORH we noted that they were all present when a manual end-to-side anastomosis was performed.

The mean duration of postoperative ileus was similar: 2,76 days in ORH and 2,54 in LRH and also the length of hospital stay did not differ significantly between the two groups though it was slightly longer in ORH group (8,5 days in ORH vs 7 days in LRH - $p 0,06$).

All data are shown in Table 2.

TABLE 2 - CLINICAL AND OPERATIVE DATA.

	ORH (n= 24)	LRH (n=17)	P value
CLINICAL DATA			
<i>ASA score</i>			
I	0	0	NS
II	0	3	NS
III	15	12	NS
IV	9	2	P=0.06 (NS)
<i>Previous abdominal surgery (%)</i>	8 (33)	2 (11)	NS
<i>Hospital stay (d)</i>	8,5 (7 – 15)	7 (5 – 9)	P=0.06 (NS)
<i>Return of bowel function (d)</i>	2,76 (2 – 5)	2,54 (2 – 4)	NS
<i>Morbidity (%)</i>	6 (25)	1 (5)	NS
• Anastomotic leakage	2 (8)	1 (5)	NS
• Occlusion	1(4)	0	NS
• Abdominal abscess	1(4)	0	NS
• Surgical site infection	2 (8)	0	NS
<i>Mortality (%)</i>	1 (4)	0	NS
OPERATIVE DATA			
<i>Mean operative time (min)</i>	89,5 (60 – 150)	80 (70 – 100)	NS
<i>Type of anastomosis</i>			
• Side-to-side (S-S)	9	11	NS
• End-to-side (E-S)	8	1	P = 0,04
<i>Associated procedures (%)</i>	8 (33)	1 (5)	P = 0,03
<i>Reoperation (%)</i>	3 (12)	1 (5)	NS

Discussion

In the last decade, we have observed a great number of elderly patients with colorectal cancer referred for surgical treatment.

Laparoscopic colorectal resection is considered the gold standard of treatment for both malignant and benign colorectal lesions, with improved short-term and comparable long-term outcomes when compared to the open method (1, 2). The benefits of laparoscopy such as less post-operative pain, better pulmonary function and reduced stress response (9, 10), are particularly important in elderly patients who are at higher risk of post-operative morbidity and mortality for their reduced functional reserve.

However, not many studies are present in literature about the benefits of LRH in elderly population with colon cancer.

In fact, right hemicolectomy can often be completed through a small transverse incision and this can provide benefits in terms of ease of operation, reduced postoperative pain, earlier return of bowel function and more rapid discharge from hospital (5).

Previous studies comparing methods of right hemicolectomy in a standard population have in fact found no significant difference in post-operative outcomes between laparoscopic resection and open colectomy when performed through a transverse incision (5, 11, 12).

In our series of patients, we found no differences between ORH and LRH in terms of mean operative time: 89,5 minutes in open vs 80 minutes in laparoscopic group and return of bowel function (2,76 vs 2,54 days). We noted that also if the difference is not statistically significant, the longer duration of ORH probably re-

flects the number of extended resections performed in open procedures respect to the laparoscopic route (33% in ORH vs 5% in LRH - $p=0,03$). Also the length of hospital stay did not differ significantly between the two groups (8,5 days in ORH vs 7 days in LRH - $p=0,06$).

Postoperative morbidity was higher in ORH (25% vs 5%) though not statistically significant and the incidence of anastomotic leakage was similar between the two groups (8% vs 5%). However, examining the technical aspects of the ileocolic anastomosis we found that in ORH group a greater number of E-S anastomosis was performed (8 vs 1, $p=0,04$). In addition, analyzing the cases of anastomotic leakage and intestinal occlusion in the ORH we noted that they were all present when a manual end-to-side anastomosis was performed. From these observations we can suggest a side-to-side anastomosis as preferred type for ileocolic reconstruction in elderly patients.

References

- Hewett PJ, Allardyce RA, Bagshaw PF, Frampton CM, Frizelle FA, Rieger NA, Smith JS, Solomon MJ, Stephens JH, Stevenson AR. Short-term outcomes of the Australasian randomized clinical study comparing laparoscopic and conventional open surgical treatments for colon cancer: the ALCCaS trial. *Ann Surg.* 2008;248:728-738.
- Abraham NS, Byrne CM, Young JM, Solomon MJ. Metaanalysis of non-randomized comparative studies of the short-term outcomes of laparoscopic resection for colorectal cancer. *ANZ J Surg.* 2007;77:508-516.
- Chautard J, Alves A, Zalinski S, Bretagnol F, Valleur P, Panis Y. Laparoscopic colorectal surgery in elderly patients: a matched case-control study in 178 patients. *J Am Coll Surg.* 2008;206:255-260.
- Yamamoto S, Watanabe M, Hasegawa H, Baba H, Kitajima M. Short-term surgical outcomes of laparoscopic colonic surgery in octogenarians: a matched case-control study. *Surg Laparosc Endosc Percutan Tech.* 2003;13:95-100.
- Tanis E, van Geloven AA, Bemelman WA, Wind J. A comparison of short-term outcome after laparoscopic, transverse, and midline right-sided colectomy. *Int J Colorectal Dis.* 2012;27:797-802.
- Russo A, Marana E, Viviani D, Polidori L, Colicci S, Mettimano M, Proietti R, Di Stasio E. Diastolic function: the influence of pneumoperitoneum and Trendelenburg positioning during laparoscopic hysterectomy. *Eur J Anaesthesiol.* 2009;26:923-927.
- Polignano FM, Quyn AJ, Sanjay P, Henderson NA, Tait IS. Totally laparoscopic strategies for the management of colorectal cancer with synchronous liver metastasis. *Surg Endosc.* 2012;26:2571-2578.
- Alves A, Panis Y, Manton G, Slim K, Kwiatkowski F, Vicaut E. The AFC score: validation of a 4-item predicting score of postoperative mortality after colorectal resection for cancer or diverticulitis: results of a prospective multicenter study in 1049 patients. *Ann Surg.* 2007;246:91-96.
- Huang C, Huang R, Jiang T, Huang K, Cao J, Qiu Z. Laparoscopic and open resection for colorectal cancer: an evaluation of cellular immunity. *BMC Gastroenterol.* 2010;10:127.
- Veenhof AA, Vlug MS, van der Pas MH, Sietsema C, van der Peet DL, de Lange-de Klerk ES, Bonjer HJ, Bemelman WA, Cuesta MA. Surgical stress response and postoperative immune function after laparoscopy or open surgery with fast track or standard perioperative care: a randomized trial. *Ann Surg.* 2012;255:216-221.
- Veenhof AA, Van Der Pas MH, Van Der Peet DL, Bonjer HJ, Meijerink WJ, Cuesta MA, Engel AF. Laparoscopic versus transverse Incision right colectomy for colon carcinoma. *Colorectal Dis.* 2010 Sep 21; [Epub ahead of print].
- Brown SR, Goodfellow PB. Transverse versus midline incisions for abdominal surgery. *Cochrane Database Syst Rev.* 2005;(4):CD005199.
- Gerges FJ, Kanazi GE, Jabbour-Khoury SI. Anesthesia for laparoscopy: a review. *J Clin Anesth.* 2006;18:67-78.
- Vignali A, Di Palo S, Tamburini A, Radaelli G, Orsenigo E, Staudacher C. Laparoscopic vs. open colectomies in octogenarians: a case-matched control study. *Dis Colon Rectum.* 2005;48:2070-2075.
- Grantcharov TP, Rosenberg J. Vertical compared with transverse incisions in abdominal surgery. *Eur J Surg.* 2001;167:260-267.
- Hernández RA, de Verteuil RM, Fraser CM, Vale LD. Systematic review of economic evaluations of laparoscopic surgery for colorectal cancer. *Colorectal Dis.* 2008;10:859-868.