Impact on morbidity of the open vs. closed surgical technique in colon cancer. A 6-year report from a single center

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Abstract

Introduction: Laparoscopic colectomy (LC) is a safe alternative for colon cancer treatment and allows all the advantages of a minimally invasive procedure. The objective of the present investigation was to measure the impact on morbidity of the open colectomy (OC) vs. LC in colon cancer.

Methodology: The study was carried out at the Solón Espinosa Ayala Hospital in Quito-Ecuador from March 2012 to March 2017 with a nonprobabilistic sample, including elderly patients with colon cancer. Sociodemographic variables, histology, days of hospitalization, surgical bleeding, surgical time, hospital stay, surgical margins, resected lymph nodes, the start of the diet, % surgical conversion during laparoscopic colectomy (CDLC), surgical complication, recurrence, surgical morbidity, and surgical mortality are included. Univariate and bivariate descriptive statistics are used.

Results: Eighty-five cases were analyzed, 52 underwent OC, and 33 underwent LC. The CDLC was 9 cases, 75% due to adhesions and 25% due to duodenal infiltration. A similar surgical time range of 121 to 180 minutes was 61%. LC complications were 2.3% and 9.4% in OC (pelvic collections and intestinal fistulas 2.4% vs 1.7%). Malnutrition was not related. Starting a diet for 2 to 4 days was 83% in LC, and 67% were OC. Hospitalization from 4 to 8 days was 87% in LC and 78% in OC. Lymph node resection (+13) was 69.6% in LC and 68.1% in OC. The laparoscope's proximal margin of the surgical piece was 5.1 to 10 cm (43.5%) in LC, 55.3% in OC, and tumor relapse of 56.2% in LC and 52.3% in OC. The mortality in LC was 12.5% and 28.8% in OC.

Conclusion: LC comorbidities and recovery were lower, but OC showed better postsurgical pathological results.

Keywords:
DeCS: Neoplasms, colon, colon neoplasms, ascending colon, descending colon, laparoscopy, colectomy.

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Introduction

Colon cancer is a common and lethal disease whose risk of developing it is influenced by environmental and genetic factors. Incidence and mortality vary significantly around the world [1]. According to figures estimated and reported by Globocan, in 2018, there were approximately 18 million new cases of cancer and approximately 10 million deaths from this cause [2]. Worldwide, the rate per 100,000 inhabitants for both sexes was 11.5, in men 13.1, and in women 10.1. The incidence in both sexes was 6.1%, in men 6.1%, in women 6.0%, and the mortality was 5.8% in both sexes, 5.4% in men and 6.3% in women [3]. The incidence in North America for both sexes was 10.6%; males 10.1%; females 11.1%; and Latin America 7.4%, 6.8%, and 8.1%, respectively. Mortality in North America in both sexes was 9.0%, in men 8.7%, in women 9.2%, and in Latin America, it was 8.7%, 8.1%, and 9.3%, respectively [4].

In Latin America, the incidence rate in both sexes is 10.6 for men, 11.4 for women, and 10.0; mortality is 6.0, 6.7, and 5.4, respectively. Moreover, in Ecuador, the incidence rate in both sexes is 7.1; men 7.2, women 7.0, and mortality are 4.4, 4.6, and 4.3, respectively [4]. Ecuador ranks 63rd worldwide according to data from Cancer Incidence in Five Continents, Vol. XI (2017). Lyon: International Agency for Research on Cancer.

According to data from the Solca Tumor Registry in Quito, the incidence rate was 7.9 for both sexes from 2011 to 2013, 7.7 for men and 7.8 for women, and the mortality rate was 6.5, the same in men and women. Annual incidence rates have increased by more than 1.5% for patients 20-49 years of age and in newly diagnosed early stages by 10-18%.

The incidence of clinical stages, according to the American Joint Committee on Cancer (AJCC), tumor, lymph nodes, and metastases (TNM) are early (Stages I and II) correspond to 38% and in advanced stages (III and IV) 62%. The most frequent type of infiltrating tumor is adenocarcinoma in 88% of patients (Quito Tumor Registry) [5].

Laparoscopic surgery is a safe alternative for colon cancer treatment and allows all the advantages of a minimally invasive procedure. In 1990, laparoscopic colon cancer surgery began. In a comparative study of patients operated on for colon cancer between 1990 and 2002, open surgery and laparoscopic surgery, they concluded the following:

1- Hospital stay was longer in open surgery (10.1 days vs. 6.5).

2- Morbidity was lower in open surgery (19.5% vs. 26.9%). 3-Mortality was similar at 1.6% and 1.7%.

4.-Overall and disease-free survival rates were 74.3 and 75.6% for open resection and 87.0 and 89.5% for laparoscopic resection, respectively.

Another randomized study showed similar 3-year recurrence rates of 16% and 18%, respectively [6].

Patients treated with colon cancer in stages I and II have a cure rate (of 75%-90%) without adjuvant treatment. Laparoscopic surgery is a safe alternative in treatment and has minimally invasive advantages [7].

The most important advantage of the laparoscopic surgical technique is the rapid and comfortable recovery of the patient, less postoperative ileus, less need for analgesia, and less hospital stay. There is scientifically proven evidence through clinical studies (prospective and randomized) of the superiority of the laparoscopic technique over open surgery. Even in disseminated tumors, removing the primary tumor should be considered a way to improve the

patient's quality of life. In studies in Bogotá, the conversion rate is 11.4%, similar to others in Latin America. In the US, the complication rate (18 vs. 22%), shorter hospital stay (6 vs. 7.6 days), and lower mortality (0.6 vs. 1.4%; all $P < 0.01$) favor laparoscopic surgery [5].

Therefore, an observational study was designed to answer the following research question: What is the impact on morbidity of the open vs. closed surgical technique in colon cancer?

Materials and methods

Study design
A descriptive, cross-sectional, and retrospective study.

Study area
The study was performed in the Department of Oncological Surgery, Solón Espinosa Ayala Hospital, of the Society for the Fight Against Cancer in Quito-Ecuador. The study period was from March 1, 2012, to March 30, 2017.

Universe and sample
The population was made up of patients admitted to the hospitalization of the institution. The sample calculation was nonprobabilistic for census-type convenience, in which all possible cases that can be analyzed are included.

Participants
Older patients with colon cancer who received neoadjuvant chemotherapy were included. Cases in which data were incomplete for analysis and cases receiving surgical treatment outside the institution were excluded.

Variables
Sociodemographic variables included age, sex, clinical stage, histopathological factors, days of hospitalization, surgical bleeding, surgical time, intestinal transit, hospital stay, postoperative pain, surgical margins, resected lymph nodes, histological lineage, and diet. Dependent variables: surgical conversion, surgical complication, recurrence, surgical morbidity, surgical mortality, abdominal collection, anastomosis dehiscence, surgical reintervention, previous abdominal surgery, body mass index, albumin, lymphocytes, and surgical mortality.

Procedures, techniques, and instruments.
The data were collected from the clinical history in a form designed exclusively for that purpose. The institutional electronic system was used for case investigation. The database was coded with serial numbers, thus protecting the confidentiality of the information and identity of the patients.

Bias avoidance
To guarantee the reliability of the information, the researchers were trained in data collection. A double checklist was used to include all cases. The data were validated and curated by the researchers HBVA and EFGC. To avoid possible interviewer, information, and memory biases,

the data were guarded at all times by the principal investigator with appropriate guidelines and records. Observation and selection bias was avoided by applying the participant selection criteria.

Statistical analysis

Initially, a descriptive univariate analysis of the sample is performed. Subsequently, a bivariate analysis was performed, considering sex and type of surgery. The statistical package used was SPSS version 17.0 for PC (Chicago, SPSS Inc.) licensed to the researchers.

Results

Study participants

The study included 85 analyzable cases (Figure 1). Fifty-two patients underwent open surgery, and 33 patients underwent laparoscopic surgery.
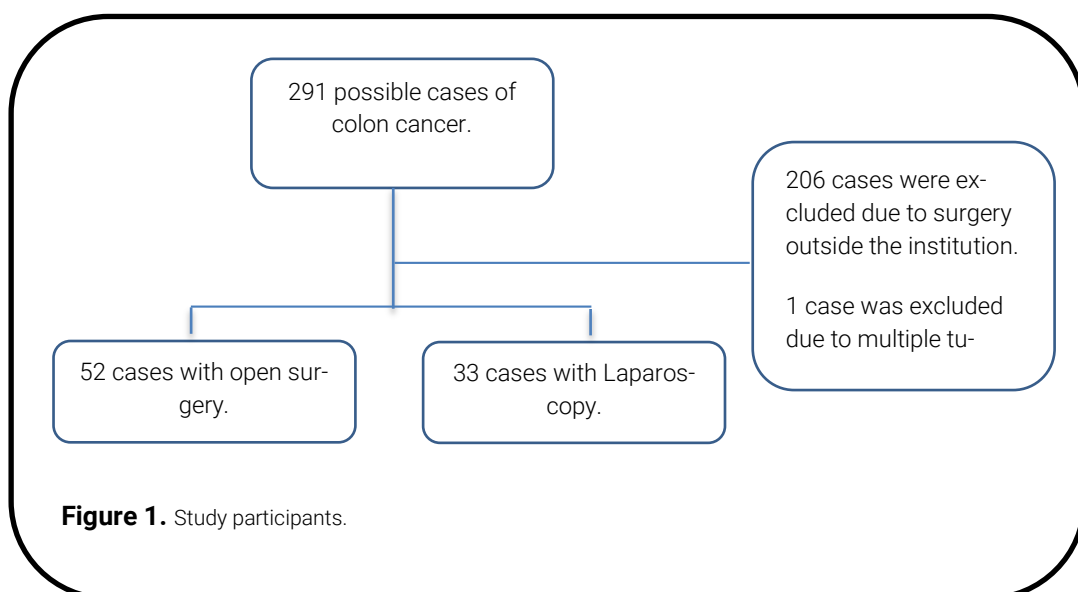
Figure 1. Study participants.

Sample characterization

Of the 291 patients diagnosed with colon cancer, the age group in which most presented was 61 to 80 years, in men 42.3% in women 44%. The histopathological diagnosis of colon cancer was adenocarcinoma with no other indication, 39% in men and 42.9% in women (Table 1). In patients with colon cancer, the prevailing histopathological type was adenocarcinoma with no other indication, with 35.6% in the right colon and 48.4% in the left colon.

Table 1. Cross table of age and sex in the study group.

Age group	Men		Women	
	No.	%	No.	%
< 20 years	5	4.1	two	1.2
20 to 40 years	twenty	16.3	26	15.5
41 to 60 years	39	31.7	54	32.1
61 to 80	52	42.3	74	44.0
81 to 100	7	5.7	12	7.1

The clinical stage that prevailed by type of laparoscopic surgery was stage III with 27.3% and open surgery stage II and III with 26.9%. According to the surgical approach, the histopathological diagnosis of colon cancer was adenocarcinoma with no other indication with 48.5% by laparoscopy and tubular adenocarcinoma with 34.6% in the open approach (Table 2).

Table 2. Histopathological diagnosis and surgical technique, of the impact on morbidity of the open

Histopathological diagnosis	Laparoscopic n=33		Open n=52		Total	
	No.	%	No.	%	No.	%
Tubulovillous adenocarcinoma	1	3.0	2	3.8	3	3.5
Mucinous adenocarcinoma	2	6.1	6	11.5	8	9.4
Tubular adenocarcinoma	9	27.3	18	34.6	27	31.8
Adenocarcinoma without other indication	16	48.5	17	32.7	33	38.8
Intestinal adenocarcinoma	1	3.0	2	3.8	3	3.5
Adenomatous adenocarcinoma	1	3.0	0	0.0	1	1.2
Adenocarcinoma in situ	2	6.1	0	0.0	2	2.4
Cancer cells signet ring	0	0.0	6	11.5	6	7.1
Neuroendocrine cancer without other indication	0	0.0	1	1.9	1	1.2
Burkitt lymphoma	1	3.0	0	0.0	1	1.2
Clinical stage						
on-site	2	6.1	0	0.0	2	2.4
I	8	24.2	13	25.0	21	24.7
II	7	21.2	14	26.9	21	24.7
III	9	27.3	14	26.9	23	27.1
IV	6	18.2	11	21.2	17	20.0
Unknown	1	3.0	0	0.0	1	1.2

Table 3. Cause of surgical conversion per colon side

Surgical conversion	Right Colon		Left Colon		Total	
	N=4	%	N=5	%	N=9	%
Adhesions	3	75	5	100	8	88.9
Duodenal infiltration	1	25	0	0	1	11.1

Table 4. Postsurgical complications and colon side.

Post surgical complications	Right Colon		Left Colon		Total	
	N=6	%	N=6	%	N=12	%
Pelvic Collection	1	16.66	2	33.35	3	25
Intestinal fistula	1	16.66	1	16.65	2	16.67
Post Surgical Ileus	2	33.36	1	16.65	3	25
Wound infection	0	0	2	33.35	2	16.67
Oral intolerance	1	16.66	0	0	1	8.33
Bleeding	1	16.66	0	0	1	8.33

The leading cause of laparoscopic conversion was the presentation of adhesions, with 75% in the right colon and 100% in the left colon (Table 3). The most relevant complications during hospitalization were postsurgical ileus in the right colon (33.36%), pelvic collections, and wound infection in the left colon (33.35%). The clinical stage according to the side of the operated colon was advanced, 38.3% in the correct stage IV and 34.2% in the left stage. The start in days of diet in the postsurgical period according to the surgical technique was similar, from 2 to 4 days, laparoscopy colectomy (LC) 83.3%, colectomy conversion during laparoscopic colectomy (CDLC) 77.8%, and open colectomy (OC) 67.4%. The start of the postsurgical diet

according to the colon side was the same, from 3 to 4 days, with 68.19% in the right colon and 68.58% in the left colon. Depending on the side of the operated colon, the hospitalization time was the same, from 4 to 8 days, the right with 81.81% and the left with 80%. Of the 85 patients who underwent surgery, 19.05% underwent LC in the right colon and 37.21% in the left colon, with 9.5% and 11.6% CDLC, respectively. The postsurgical hospitalization time did not present differences in the approach technique, prevailing from 4 to 8 days, by LC 87.5%, 77.8% in CDLC, and 81.01% in OC. The body mass index of 20 to 24.9 prevailed according to the surgical technique, 43.5% in LC, 66.7% in CDLC, and 54.3% in OC.

The most relevant complications during hospitalization were postsurgical ileus in the right colon (33.36%), pelvic collections, and wound infection in the left colon (33.35%). The clinical stage according to the side of the operated colon was advanced, in colon cancer stage IV with 38.3% and in the left with 34.2%.

The start in days of diet in the postsurgical period according to the surgical technique was similar, from 2 to 4 days in LC 83.3%, CDLC 77.8%, and OC 67.4%. The start of the postsurgical diet according to the colon side was the same, from 3 to 4 days, with 68.19% in the right colon and 68.58% in the left colon. Depending on the side of the operated colon, the hospitalization time was the same, from 4 to 8 days, the right with 81.81% and the left with 80%. Of the 85 patients operated on, 19.05% underwent LC in the right colon and 37.21% in the left colon, with 9.5% and 11.6% in CDLC, respectively. The postsurgical hospitalization time did not present differences in the approach technique, prevailing from 4 to 8 days, by LC 87.5%, CDLC 77.8%, and OC 81.01%. The body mass index of 20 to 24.9 prevailed according to the surgical technique, 43.5% in LC, 66.7% in CDLC, and 54.3% in OC.

According to the surgical technique, the presurgical albumin ranged from 3.6 to 4.5 grams, with 71.15% in OC, 70.83% in LC, and 55.56% in CDLC. According to the surgical technique, the presurgical lymphocytes ranged from 1,300 to 4,000 u/µL, with 94.23% in OC, 91.67% in LC, and 55.56% in CDLC. Complications in postsurgical days due to surgical technique occurred from 5 to 8 days in two cases due to CDLC; in the others, there was one case up to day 4. The surgical time of the prevailing approach technique was 121 to 180 minutes, with 52.2% in LC, 44.4% in CDLC, and 61.7% in OC. The surgical approach time was similar on the colon side, from 121 to 180 minutes on the right with 61.1% and 55.6% on the left. The proximal margin obtained by the approach technique was more than 10 cm: 43.5% for LC, 66.7% for CDLC, and 55.3% for OC. According to the operated colon side, the proximal margin was similar, with more than 10 cm, 55.8% in the right colon and 50% in the left colon. According to the proximal margin, tumor relapse occurred at the extremes of the groups, less than 2.5 cm in 50% and more than 10 cm in 21.4%. The distal margin was similar, with more than 5.1 cm in the surgeries performed, 65.2% in LC, 55.6% in CDLC, and 70.2% in OC.

Tumor recurrence was not related according to the distal margin of the surgery; it occurred in the group of 5.1 cm and more with 24.5%, and from 1.1 to 2.5 cm, 14.3%.
The distal margin obtained by the side of the operated colon with 5.1 cm and more was in favor of the right with 88.5% and the left with 41.5%.

The number of nodes resected according to the surgical technique was in favor of 13 nodes, and more in LC was 69.6%, in CDLC was 88.9% and 68.1% in OC.
The resection group of 5 to 12 nodes with 27.8%, followed by the one with up to 4 nodes with 20%, presented lymph node relapse more frequently.

Deaths due to oncological causes occurred in 28.8% of OC and 12.5% of LC. None due to surgical technique.

Table 5. Study variables by type of surgery.

	Laparoscopic colectomy		Conversion during LC		Open colectomy	
	N=24	%	N=9	%	N=52	%
Body mass index (kg/m2)						
< 19.9	0	0.0	1	11.1	2	4.3
20 to 24.9	11	45.8	6	66.7	28	54.3
25 to 29.9	9	37.5	0	0.0	17	32.6
30 and +	4	16.7	2	22.2	5	8.7
days of hospitalization						
4 to 8 days	21	87.5	7	77.8	40	77.0
9 to 12 days	3	12.5	1	11.1	6	11.5
13 and + days	0	0.0	1	11.1	6	11.5
Start of the diet						
< 2 days	1	4.2	0	0.0	0	0.0
3 to 4 days	20	83.3	7	77.8	31	67.4
5 to 8 days	3	12.5	two	22.2	14	30.4
9 and + days	0	0.0	0	0.0	1	2.8
Clone commitment						
Right colon	8	33.3	4	44.4	30	57.7
Left colon	16	66.7	5	55.6	22	42.3
Lymphocytes (u/u/L)						
< 1300	1	4.17	1	11.11	2	3.85
1301 to 4000	22	91.67	7	77.78	43	94.23
> 4001	1	4.17	1	11.11	1	1.92
Compromised colon segment						
Right colon	8	34.8	4	44.4	30	
Left colon	16	65.2	5	55.6	22	
Complications in postsurgical days						
Up to 4 days	1	4.1	0	0.0	1	1.9
5 to 8 days	1	4.1	2	22.2	1	1.9
9 to 12 days	0	0,	0	0.0	1	1.9
Approach technique						
61 to 120 min	4	17.4	1	11.1	11	23.4
121 to 180 min	12	52.2	4	44.4	28	61.7
181 to 240 min	4	17.4	2	22.2	6	12.8
241 and + min	3	13.0	2	22.2	1	2.1
Proximal margin						
Up to 2.5 cm	0	0.0	0	0.0	2	4.3
2.6 to 5 cm	6	26.1	0	0.0	4	8.5
5.1 to 10 cm	7	30.4	3	33.3	15	31.9
More than 10 cm	10	43.5	6	66.7	25	55.3
Distal margin						
up to 1 cm	0	0.0	0	0.0	1	2.1
1.1 to 2.5 cm	5	21.7	2	22.2	7	14.9
2.6 to 5 cm	3	13.1	2	22.2	6	12.8
5.1 and + cm	15	65.2	5	55.6	33	70.2
Resected nodes						
Up to 4 g	2	8.7	0	0.0	3	6.4
5 to 12 g	5	21.7	1	11.1	12	25.5
13 y + g	16	69.6	8	88.9	31	68.1
Mortality						
Deceased	3	13.0	0	0	15	32.6

Discussion

The present cross-sectional study analyzed patients operated on for colon cancer by LC compared to those undergoing OC from March 2012 to March 2017. As inclusion criteria, the diagnoses of colon adenocarcinoma undergoing laparoscopic surgery or open surgery in the Solón Espinosa Ayala Hospital (Solca Núcleo Quito) were excluded from March 2012 to March 2017 those who received neoadjuvant chemotherapy, with primary prior to colon cancer and in clinical trials.

In the present study, 291 patients were identified, 123 men (42.3%) and 168 women (57.7%). The female‒male ratio was 1.3. Unlike the study by Francisco LK [7], of 22 trials with 2965 participants, there were no differences in gender; in GLOBOCAN 2018, the rates favored men, unlike in the present study, it was toward women.

The vulnerable groups by age were 61 to 80 years old (42.3%) and 41 to 60 years old (31.7%), similar to what is reported in the world literature and which contrasts with the data of González-Duarte J [1]. and the Cancer Epidemiology book in Quito.

The histopathological type that prevailed was adenocarcinoma without other indication; in men, 39%; in women, 42.9%; in the right colon, 37.4%; and in the left colon, 48.3%. By LC, they were 48.5%, and by the OC approach, they were 32.7%. The clinical stage was stage III, 27.3% in LC, and stages II and III, 26.9% in OC; these data were similar to those found in the tumor registry of Solca Quito and the study by Peña Torres [2].

A total of 85 patients who met the inclusion criteria were identified; from the right colon, there were 10.3% cases of CDLC, and from the left colon, 13.2%, which would be in a low range when comparing large series ranging from 2% to 34.7%, as in that of González L [8].

They caused conversion of the right colon 75% due to adhesions, 25% due to infiltration into the duodenum, and of the left colon 100% due to adhesions, without significant importance, as in the data of Manterola C, [6] and Sánchez Gallego [9].

The surgical resection time that prevailed was 121 to 180 minutes, which was similar in the right colon (61.1%) and left colon (55.6%). For laparoscopy, 52.2% and open 61.7%, the techniques are comparable by colon side and surgery time, similar to the data of Schwenk W [10]. When compared with data from Ignacio J [11], of 2992 participants, the duration of surgery was not significantly shorter in laparoscopy.

Regarding surgical complications during hospitalization, they were 5.2% in the right colon and 5% in the left colon, with LC 2.3%, CDLC 3.5%, and OC 9.4%, favoring the less invasive procedure, as reported in the articles by Bannura C [5] and Manterola C [6] with data less than 5%.

In OC, there were more postsurgical complications: pelvic collections and intestinal fistulas 2.4%, surgical wound infection, oral intolerance, and ileus 1.17% each, and LC presented pelvic collection and ileus 1.17%, which favors the closed procedure as in the study by Sánchez [6], Gallego [13], with 13% vs. 27%.

The body mass index concerning complications in the surgical approach technique was not related; they presented 25 to 29.9 (overweight) in LC at 39.1%; in CDLC, over 30 (obesity)

at 22.2%, and in OC from 25 to 29.9 (overweight) 32.6%, as in the study by Rodriguez H. [12] The prevalence of obesity was 13%.

The postsurgical days on which complications occurred were 50% laparoscopically between 4 to 8 days and 33.3% openly; there was no difference in the onset of complications, as in the Bannura study [5] with 35%.

The time in days from the start of the diet to the postsurgery varied between the laparoscopic and open surgery approaches; it was from 2 to 4 days, 83.3% and 67.4%, respectively, being in favor of the noninvasive approach, as in the work of Manterola C [6] with 70% vs. 55%, respectively.

The hospitalization time of our research by surgical technique was 87% laparoscopy from 4 to 8 days and 78.3% in open surgery, being favorable for noninvasive, as in the work of Sánchez Gallego [9] and Francisco LK [7]. A total of 2544 participants provided data showing that the postoperative hospital stay was 1.5 days shorter in the laparoscopy group.

Blood loss by surgical technique was in favor of Laparoscopy 82.6%, compared to open 60.4%, with productions less than 100 cc, which are related to data obtained from the works of González L [8] and Ignacio J. [11] with 75% and 79%, respectively.

According to the surgical approach technique, the number of lymph nodes resected by LC was more than 13 nodes (69.6%), and the number resected by OC was 68.1%, which was slightly favorable in the noninvasive approach. Similar results were obtained in Rodríguez Hernández [13] (67%). Moreover, when comparing tumor relapse, 27.8% presented 5 to 12 nodes; there was no significant relationship between the number of nodes removed, as in the work of Sánchez [9] and Schwenk [10] with 25%.

The proximal margin of the surgical piece more than 10 cm, about the approach technique, was in favor of OC with 55.3% and LC with 43.5%; there was no compromised margin in any of the techniques, and the data obtained were similar to what was reported in the work of Rodriguez Hernández [13].

Recurrence of the 79 operated patients with a proximal surgical margin more significant than 10 cm was 21.4% open surgery and 6% LC, which favors the noninvasive procedure, as in the work of Manterola C [6] with 45% and 15%, respectively.

The mortality rates of colon cancer patients who underwent laparoscopic surgery were 12.5% and 28.8% in patients with OC. Similar to the study by Galindo Vélez SM [13] with 13% and 39%.

Future studies should prospectively assess these findings.

Conclusions

The CDLC was 75% due to adhesions and 25% due to duodenal infiltration. The resection surgical time from 121 to 180 minutes favored OC 61.1% vs. 52.2%. Hospitalization complications were as follows: pelvic collections 0.9%, surgical wound infection 1.7%, postsurgical ileus 1.7%, intestinal fistulas 0.9% and bleeding 0.9%, all due to open surgery. Body mass index, hypoalbuminemia, and lymphocytosis were not related to complications.

LC was better in starting diet (2 to 4 days) 83.3% vs 67.4%, in hospitalization (4 to 8 days) 87% vs 78.3%.

Lymph node resection (+13 nodes) by LC was 69.6% vs. 68.1% in OC, with a tumor recurrence of 62.5% in both groups. The best proximal margin in the surgical piece by LC (+ 10 cm) was

43.5% vs. 55.3% in OC, presenting a tumor relapse of 56.2% and 52.3%, respectively. The distal margin by laparoscopy (+ 5.1 cm) was 65.2% vs 70.2% in open, with tumor relapse of 81.2% LC and 63.5% in OC. The vital status of patients undergoing laparoscopy was 12.5% dead and 28.8% open concerning their tumor disease, but not due to surgery.

Abbreviations

LC: laparoscopic colectomy.
CDLC: conversion during laparoscopic colectomy.
OC: Open colectomy.

Administrative information

Additional Files

The authors declare none.

Author contributions

1. Conceptualization: Hugo Bladimir Vivanco Armijos.
2. Formal analysis: Edwin Fabián Guallasamín Chalco.
3. Research: Hugo Bladimir Vivanco Armijos.
4. Methodology: Hugo Bladimir Vivanco Armijos, José Yépez Maldonado.
5. Project administration: Hugo Bladimir Vivanco Armijos.
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10. Writing - revision and editing: Edwin Fabián Guallasamín Chalco.

All authors read and approved the final version of the manuscript.

Availability of data and materials

Data availability is available upon request to the corresponding author. No other materials were reported.

Statements

Ethics committee approval

It does not apply to observational studies with a review of databases or medical records.

Consent to publication

This does not apply to studies that do not publish explicit images such as CT scans, MRIs, and physical exam images.

Conflicts of interest

The authors declare that they have no conflict of interest or competence.

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