

Laparoscopic Ileocecal Resection in Crohn's Disease: The Experience of One Institution

Danilov MA^{*}, Baychorov AB, Leontev AV

Department of Coloproctology, Moscow Clinical Scientific Center, Moscow, Russia

Abstract

Surgery is crucial in the treatment of Crohn's disease complications, particularly obstructive and septic. The risk of surgical complications in this patient group is particularly high due to transmural inflammation of the intestinal wall. If there is intestinal blockage in the compensatory stage, individuals with Crohn's disease are evaluated for routine surgical therapy.

Keywords: Terminal ileitis • Laparoscopic resection • Crohn's disease • Liver function

Introduction

Surgery plays a major role in the management of complications of Crohn's disease, in particular obstructive and septic [1]. Due to transmural inflammation of the intestinal wall, the risk of surgical complications in this patients group is extremely high. Routine surgical treatment of patients with Crohn's disease is considered if there is intestinal obstruction in the stage of compensation, data for the presence of interintestinal fistulas, or in patients with a high index of disease activity (CDAI more than 220). Intestinal obstruction in Crohn's disease is most often associated with stricture of the terminal ileum (35%-50%), jejunum (22%-36%), and less often with the localization of the pathological process in the colon (5%-17%) [2]. As a rule, when intestinal obstruction occurs, treatment begins with intensive drug therapy, provided that there are no data for peritonitis and septic conditions [1]. Recently, thanks to the use of anti-TNF drugs, many patients have been able to achieve stable remission and at least postpone surgical treatment [3]. On the other hand, long-term use of anti-TNF drugs may lead to an increased risk of developing lymphoma and lymphoproliferative diseases, as well as skin neoplasms [4]. Aggressive drug therapy can often lead to the development of granulomatous enteritis, scarring in the small intestine and the formation of a stricture that requires urgent surgery. Extended resections in Crohn's disease are not recommended and inappropriate, since repeated surgical interventions can lead to short bowel syndrome [5]. Therefore, the most common operation for stricture Crohn's disease is ileocecal resection, which can be performed both urgently and routinely.

The aim of this study is to evaluate the results of performing ileocecal resection in patients with strictured Crohn's disease.

Materials and Methods

We conducted a retrospective study analyzing the results of treatment of patients diagnosed with Crohn's disease treated at the department of coloproctology of the Moscow Clinical Scientific Center named after SA Loginova from October 2015 to January 2020. The inclusion criteria for the study were patients with complicated forms of Crohn's disease requiring surgery. A written message was received from all patients included in the

***Address for Correspondence:** Danilov MA, Department of Coloproctology, Moscow Clinical Scientific Center, Moscow, Russia; Tel: 79671367687 Email: dma23rus@mail.ru

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study. The study was approved by the local ethical committee of the MCSC A.S. Loginova. To diagnose Crohn's disease, all patients, without exception, underwent a total colonoscopy with ileoscopy, according to which the mandatory endoscopic signs characteristic of Crohn's disease should have been: aphthous ulcers, a "cobblestone" mucosal change and a segmental (Intermittent) nature of the lesion. Before surgery, all patients underwent CT-enterography to determine the extent of the bowel lesion and to plan the resection volume. To assess the activity of Crohn's disease, we used the Crohn's Disease Activity Index (CDAI), where values less than 150 are characterized by minor manifestations of the disease, and values over 450 are characterized by a super-severe course.

Perioperative period

In Center of Loginov, decision-making regarding the tactics of treatment for each patient was carried out by a multidisciplinary team, which includes a coloproctologist, a gastroenterologist and a radiologist, in certain cases, when the situation and the clinical course of the patient require it, the team of specialists is supplemented by an endoscopic surgeon, nutritionist, morphologist, etc. In cases of ineffectiveness of drug therapy (Corticosteroids, anti-TNF) and the presence of stricture according to CT-enterography, a decision is made on the need for surgical treatment. In the presence of an abscess, the first stage is drainage, and then, in the delayed period, surgical treatment. With an ongoing septic condition against the background of drug therapy, surgery is also indicated. If necessary, the patient is transferred to the intensive care unit to prepare for surgery (correction of water and electrolyte disorders and protein imbalance).

Surgical technique

Thirty minutes before the start of the operation, a prophylactic dose of antibacterial drugs (metronidazole 500 mg and ciprofloxacin 500 mg) was parenterally administered, in the postoperative period, with a favorable course; standard antibacterial therapy continues (Ciprofloxacin 500 mg 2 times a day, metronidazole 500 mg 3 times a day) within 5-7 days. In the presence of positive cultures of intraoperative material (mesenteric lymph nodes and blood from the portal system), antibiotic therapy is changed depending on sensitivity. The nasogastric tube and urethral catheter are placed before the start of the intervention and removed immediately after surgery.

The patient was placed on a table with legs spread apart and his right hand brought to the body. The placement of trocars is as follows: an optical 10 mm trocar is installed in the paraumbilical region (vertical skin incision above the umbilicum, for subsequent minilaparotomy along the midline), a 10 mm trocar in the left mesogastric region along the midclavicular line, 5 mm in the suprapubic region along the midline (Figure 1) and 5 mm in the left epigastric region, in the middle of the line connecting the edge of the costal arch and the umbilical ring. In this case, the distance from the trocars depends on the size of the abdominal cavity and BMI, therefore, the distances from the trocar placement sites to the umbilical ring are the same (a=b=c), such a trocar placement scheme, firstly, assumes an ergonomic

change in the surgeon's place in relation to the operating table, secondly, the principle of triangularity is preserved in all positions.

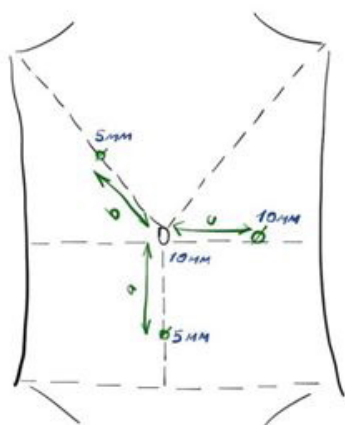


Figure 1. Placement of trocars in laparoscopic ileocecal resection.

After placing the trocars, the operating table is given the Trendelenburg position and tilted to the left side (about 30 degrees), a thorough revision and visual assessment of the entire small and large intestine is performed, as well as a search for pathological formations in the small pelvis and abdominal cavity (fistulas, abscesses). In contrast to right-sided hemicolectomy for malignant neoplasms, when the first stage is lymphadenectomy and vascular clipping, in the case of Crohn's disease, the operation begins with the mobilization of the terminal ileum and right sections of the colon. This is done in order to assess the thickness of the mesentery, since in most cases, due to tissue infiltration and lymphadenopathy, this thickening is significant and only after this is the intersection of the vessels, most often the intersection of the ilioocolic artery and vein is performed, closer to their beginning. We adhere to the concept of removing a larger amount of mesentery with altered lymph nodes (Figure 2), as this reduces the risk of disease recurrence in the anastomotic area as soon as possible after surgery and the possibility of optimal drug remission appears [6]. With a significant thickening of the mesentery, the presence of a massive infiltrate, we complete the mobilization of the latter, perform a mini-laparotomy along the midline of the abdomen, and cross the vessels and mesentery in an extracorporeal way.



Figure 2. Scheme of the ileocecal resection: 1 - standard ileocecal resection, 2 - ileocecal resection with extended mesentery resection.

The intersection of the ileum and the ascending colon was performed using linear staplers NTLC 55 or 75 mm (Ethicon J and J) with adjustable height of staple closure, depending on the thickness of the intestinal wall, a blue (1.5 mm) or yellow mark (1.8 mm) was used-analogy of blue and yellow cassette. The three-row suture ensures maximum tightness of the stapler suture, and therefore additional peritonization of both stumps was not routinely required. Anastomosis in all cases was formed extracorporeally,

side to side, anti-peristaltic, using a linear stapler NTLC 55 mm Ethicon J and J (blue mark), with suturing the technological hole with a continuous suture PDS II 3-0, as well as the imposition of a second row of rare interrupted sutures Vicryl 3-0. The intervention was completed by installing a tubular drainage into the pelvic cavity through a 10 mm trocar in the left mesogastric region.

Postoperative period

From the first day after surgery, all patients were prescribed parenteral nutrition until obvious peristalsis appeared. Analgesic therapy was carried out by introducing an analgesic into the epidural space using an elastometric pump with 0.75% naropin (at a rate of 4 to 8 ml per hour). In the absence of an analgesic effect, intramuscular administration of tramadol or morphine. Patients were activated from the first day of the postoperative period, the drainage was removed, as a rule, on the 3rd day; discharge from the hospital was carried out on the 6th-7th days after the operation.

Results

October 2015 to January 2020 in the Department of Coloproctology, MCSC them. A.S. Loginov performed 46 ileocecal resections for a complicated Crohn's disease. The average age of the patients was 37.6 years, of which there were 21 women and 25 men. Eighteen patients (39.1%) were operated on for urgent and emergency indications, the average bed-day of patients in this subgroup before surgery was 8.8. The rest (28 patients)-as planned, the indication for surgical intervention was the ineffectiveness of conservative therapy, the presence of a fibrous component in the thickened wall of the ileum according to CT enterography and subcompensated intestinal obstruction. The ASA status was: II-in 14 patients, III-in 28 patients and IV-in 4 patients (Table 1).

Conversion was performed in 4 (8.7%) patients due to technical difficulties caused by: in 2 patients due to massive infiltration of the ileal mesentery, in one-from a pronounced adhesive process in the right ileal region after appendectomy, and one has visceral lipomatosis.

The average duration of surgery was 128.2 minutes; in cases of conversion, there was an increase in the duration of surgery (143.1 minutes). The average blood loss was 50 ml (Table 2). According to preoperative diagnostics, the average length of the intestine lesion did not exceed 12.6 cm, despite this, the volume of the removed intestine (including the ileocecal angle) was 35.4 cm, this three-fold increase in the length of the removed intestine can be explained by the fact that in most In cases of terminal ileitis, the distal edge of the altered intestine is usually located in the immediate vicinity of the ileocecal angle and the preservation of this part of the ileum is not expedient, since the formation of an anastomosis can be compromised by the proximity of the ileocecal valve and the short ileal stump. On the other hand, when forming an anastomosis, it is necessary to select a "suitable" section of the intestine-so that visual changes in the intestinal wall are minimal or completely absent, and there is no dilatation (Prestonotic Expansion) of the intestine, in this regard, the volume of resection must be expanded.

	Value (46)
Age	37,6+7,6
Gender	
Male	21 (45,6%)
Female	25 (44,4%)
Crohn's disease activity index	
150-300	4 (8,7%)
More than 300	42 (91,3%)
ASA	
II	14 (4,3%)
III	28 (61,0%)
IV	4 (34,7%)

Table 1. Demographic and clinical indicators of patients.

In the postoperative period, there were complications that required repeated interventions: 1-bleeding from the mesenteric vessels, 1-anastomotic leakage, 1-early adhesive obstruction. In the first case, laparoscopy and suturing of the mesentery were performed, postoperative smooth, no recurrence of bleeding was noted. Anastomotic leakage was diagnosed on the 4th day of the postoperative period, the anastomosis was uncoupled (Lachey-type surgery) and sanitation relaparotomy. Adhesive obstruction required nasointestinal intubation.

Purulent-septic wound complications developed in the postoperative period in 4 patients (8.7%), it is worth noting that all were operated on for urgent indications, with one patient with anastomotic leak. There were no urinary disorders; the transurethral catheter was removed on the first day of the postoperative period. The postoperative period was complicated in 4 patients by the addition of Clostridial infection, which required the administration of per os vancomycin at a dosage of 500 mg three times a day, and as a consequence, the prolongation of the patient's stay in the hospital (6.2 and 12.5, respectively, $p=0.02$). The intensity of pain on the 2nd day of the postoperative period was 3.8 on the VAS scale (Table 2).

	Value (46)
Conversion	4 (8,7%)
Blood loss (ml)	50
Duration of surgery (min)	
Laparoscopy + conversion	143,1+17,8
Laparoscopy	128,2+14,6
Preparation length (cm)	35,4+5,4
Preparation length according to CT data (cm)	12,6+2,2
Reoperation	
Bleeding	2 (4,2%)
Anastomotic leakage	1 (2,1%)
Adhesive obstruction	1 (2,1%)
Other complications	
Wound purulent-septic	3 (4,3%)
Urinary disorders	0
Clostridium difficile colitis	4 (8,7%)
Average intensity of pain syndrome on the 2nd p/o day (VAS)	3,8
Length of hospital stay (day)	
Complicated postoperative course	12,5+2,4 (8)
Without complications	6,2+1,2 (38)

Table 2. Immediate results of treatment.

Discussion

Despite the fact that conservative therapy for Crohn's disease in recent decades has become much more effective and is able to induce persistent and long-term remission, many patients sooner or later undergo surgical treatment due to the developed complications [7]. As a rule, the most common complication in which urgent surgery is necessary is the formation of a stricture-the cause of intestinal obstruction. Most often, strictures are localized in the terminal ileum; the ineffectiveness of drug therapy in this case is an indication for ileocecal resection [8]. The most basic rule of surgical treatment for Crohn's disease is the implementation of "economical" resection, therefore, an accurate assessment of the prevalence and activity of the process at the preoperative stage is necessary [9]. The laparoscopic approach, on the one hand, has all the advantages of minimally invasiveness (shortening the length of stay in the hospital, lower pain intensity, fewer postoperative complications, etc.), on the other hand, it allows performing interventions without increasing the volume of bowel resection, these postulates supported by RCT results and meta-analyses [10-11]. In the presence of a thickened (infiltrated) mesentery and associated technical difficulties, it is advisable to perform minilaparotomy with manual vascular ligation and extracorporeal ileo-ascendo-anastomosis formation [12]. In our series of interventions, we formed an anti-peristaltic

hardware anastomosis to all patients; the frequency of complications in the postoperative period is comparable to the world indicators. The latter meta-analyses demonstrate anastomotic leakage in the range of up to 7.1% (in our study, 2.1%) [13]. Pathological examination of the preparation with a second operation showed that there was an active inflammatory process in the anastomotic zone, which probably caused the anastomosis to fail. If we talk about the advantages of one or another type of anastomosis, then a side-to-side anastomosis is considered more reliable [13].

Conclusion

The terminal ileum and its obstruction is the most common complication of Crohn's disease. Laparoscopic ileocecal resection with the formation of a side-to-side extracorporeal ileoascendoanastomosis, in our opinion, is a safe, relatively simple and reproducible operation.

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