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Laparoscopic Ileo-Cecectomy for Crohn's Disease with Side to Side Stapled Anastomosis: 21 Consecutive Cases

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Abstract

Introduction: Terminal ileum is the most involved tract in Crohn's disease and its obstruction is one of the most frequent complications. Surgery plays an important role both in the management of chronic strictures and in acute complications not improving with medical therapy.

Methods: We investigated the outcomes of laparoscopic ileo-cecectomy with mechanical anastomosis in patients affected by Crohn's, evaluating intra-operative safety and postoperative outcomes such as bleeding and anastomotic leak.

Results: From January 2011 to December 2015, 21 patients underwent laparoscopic ileo-cecectomy with stapled extracorporeal ileo-colic side-to-side anti-peristaltic anastomosis for complicated Crohn's disease. Twelve patients (57.1%) were admitted in emergency setting. Mean operating room time was 154 minutes; in 4 patients conversion to open technique was necessary. Total morbidity rate was 19%, with 2 reoperations (9.5%), one due to staple-line bleeding and the other to anastomotic leak (4.7%). Mean hospital stays in uncomplicated and complicated patients were respectively 5.8 and 14 days.

Conclusion: In the management of complicated Crohn's disease, laparoscopic ileo-cecectomy with stapled extracorporeal anastomosis seems to be a safe technique, in spite of the well known fistulizing nature of the disease, and also easy to perform.

Keywords: Crohn's disease; Ileo-cecectomy; Laparoscopy

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Introduction

Surgery plays a main role in the management of obstructive and septic complications in Crohn's disease (CD). However, in this group of patients, the risk of surgical complications is very high due to transmural inflammation of the intestinal wall and the consequent septic complications [1]. Elective surgical treatment is proposed in case of patients with sub-occlusion due to strictures, chronic fistulas or in patients with high CD index (>220) with an ileo-cecal disease [1]. Acute intestinal obstruction is the most frequent complication of CD; usually, 35-54% of these cases concern terminal ileum; jejunal (22-36%) or colonic disease (5-17%) can also cause occlusion [2]. In acute obstructive presentation, medical therapy should be attempted first, if peritonitis or fever does not occur [1]. Recently, thanks to the development of new drugs and in particular after the use of anti-tumor necrosis factor (TNF) agents, many patients could significantly improve, avoiding or at least delaying surgical approach [3]. Unfortunately, monoclonal antibodies such as anti-TNF agents can increase the risk of lymphoma, cutaneous neoplasms [4] or other lymphoproliferative affections [5] in long-term treated patients. Sometimes, notwithstanding aggressive medical therapy, granulomatous enteritis can develop, resulting in scar thickening and stenosis, with obstructive symptoms requiring surgical intervention. Normally, right colectomy or more extensive resections are not recommended, and tissue-sparing techniques are preferred, preserving patients from short bowel syndrome. Resection of terminal ileum and cecum is the most common surgical approach and is performed both in acute and chronic presentations [1].

In this study we investigate safety and effectiveness of laparoscopic ileo-cecectomy for CD, in the aim to combine the advantages of minimally invasive surgery with tailored and tissue-sparing philosophy.

Materials and Methods

We performed a retrospective study, analyzing data of patients undergoing laparoscopic ileo-cecectomy for CD in our Department between January 2011 and December 2015. Inclusion criteria were: patients with complicated ileo-colic Crohn's disease, requiring surgical operation. For being diagnosed with CD, all patients had to undergo full colonoscopy, with the following three major endoscopic signs being found: aphthous ulcers, cobblestone appearance and discontinuous lesions (skip areas) [6]. For Crohn's disease activity index, we used the one published by Best WR, where index values of 150 and below are associated with quiescent disease and values above 450 are seen with extremely severe disease [7]. Exclusion criteria were: patients undergoing ileo-cecectomy for complicated appendicitis of unknown etiology. Patient's data were collected from the hospital database and from patient schedules, focusing on intra and postoperative complications such as: conversions from laparoscopy to laparotomy, operating room time, reoperation, anastomotic leak, postoperative bleeding and length of hospital stay. The protocol was approved by the Ethical Committee of the institution involved in the study: 'Paolo Giaccone' University Hospital, Palermo, Italy. Written informed consent was signed by all patients, before inclusion in the study.

Pre-operative patient management

In our Department, patients with CD are evaluated by a multidisciplinary team, including surgeon, gastroenterologist and radiologist, in order to obtain a shared decision making. In patients with strictures, if conservative approach did not improve the clinical picture and a magnetic resonance enterography (MRE) demonstrated the persistence of stricture, surgical indication is given. If collections are present, a first non-operative management is usually offered, with a computed tomography (CT) or ultrasound (US)-guided percutaneous drainage. If sepsis is controlled, conservative therapy is continued; in patients with persistent septic picture, surgical approach is pursued.

Surgical technique

Antibiotic therapy (a combination of Ciprofloxacin 50 0mg and Metronidazole 500 mg) is administered 30 minutes before beginning of the operation, then Ciprofloxacin is continued 2 times a day and Metronidazole three times a day till the outpatient control after hospital discharge (normally between 7th and 10th post-operative day, POD) and then they are continued if necessary, depending on the activity of CD. Both nose-gastric (NG) tube and urinary catheter are placed before surgical incision and removed in first POD. Laparoscopic approach to ileo-cecectomy starts with trocars positioning; we use the 3 trocars technique: a peri-umbilical 10/12 mm camera port, a 5 mm operative access in the left hypocondrium and another 5 mm port in the left iliac fossa. First, a careful evaluation of the entire bowel is performed in order to find the presence of strictures, fistulas, abscesses or any other pathological aspects related to CD. Unlike laparoscopic colectomy for cancer, starting with vascular ligation, in CD cases we mobilize terminal ileum and right colon first, in order to perform a correct evaluation of the mesenteric thickness, usually considerably increased in CD, and then vascular ligation. If mesenteric thickness allows carrying out a good vascular dissection, laparoscopic ligation is performed. In cases with important increase of mesenteric thickness, we consider laparoscopic control not safe enough, and we perform bowel exteriorization through a small transverse laparotomy in the right flank, with traditional vascular ligation. After the resection, anastomosis is performed in an extracorporeal, side to side, anti-peristaltic fashion, with a Touchstone linear stapler (Touchstone International Medical Science Co., Ltd, Suzhou, China), with the 38 and 45 mm cartridges (LC8038 and LC8045, respectively) as shown in Figures 1 and 2 [8]. In all but one cases we used the blue cartridge, in only one patient the green cartridge was used because of remarkable thickness of the bowel wall. One tubular drain was left in the abdominal cavity and removed in second to fourth post-operative day (POD).

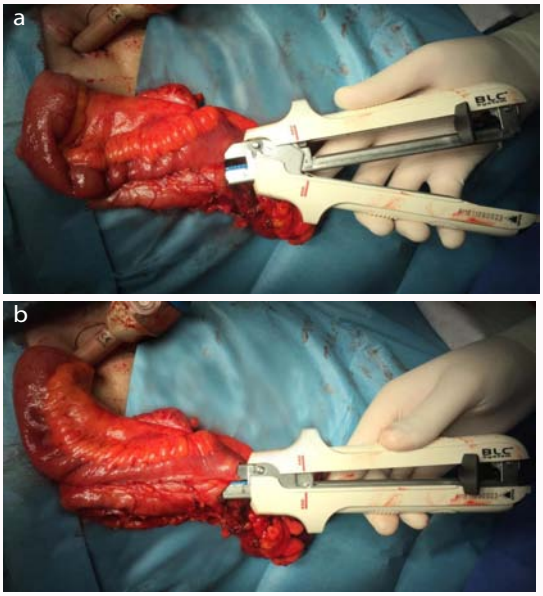

Figure 1a and 1b: Anastomosis is performed in an extracorporeal, side to side, anti-peristaltic fashion, with a Touchstone linear stapler LC80, with the 38mm 'blue' cartridge (Touchstone International Medical Science Co., Ltd, Suzhou, China).

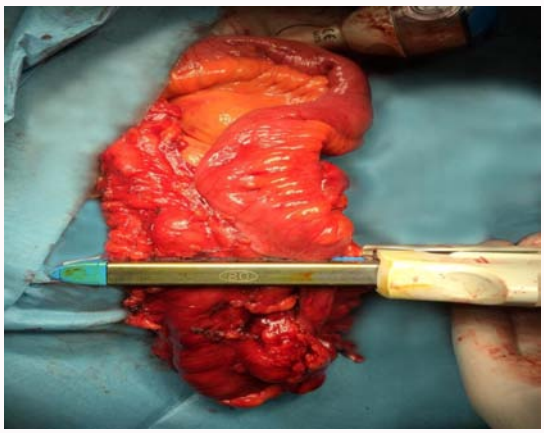

Figure 2: After anastomosis is performed, the introduction site of the stapler is closed and resected with another cartridge of the same instrument (Touchstone linear stapler LC8038).

Peri-operative patient management

Patients continue nothing per os (NPO) and total parenteral nutrition (TPN) until the first bowel sound. Analgesic therapy is administered in the first and in the second POD with 2 ml/min elastomeric pump (morphine 10 mg + ketorolac 30 mg + NaCl 0.9% 46 ml per day). Patients are mobilized since the first POD and bowel sounds usually registered in second POD. Patients were normally discharged between 5th and 7th POD.

Table 1: Clinical characteristics of the study population. WSES: World Society of Emergency Surgery, ASA: American Society of Anesthesiology.

Population	Number (21)
Age (years)	41.8
Sex, n (%) Male Female	 12 (57.1%) 9 (42.9%)
Manheim Peritonitis Index Elective patients Conservative treatment + surgery Immediate surgery	 18 22 23
WSES Sepsis Severity Score Elective patients Conservative treatment + surgery Immediate surgery	 18 11 14
ASA Score, number of patients 2 3 4	 6 12 3

Results

From January 2011 to December 2015, twenty-one patients underwent laparoscopic ileo-cecectomy for complicated Crohn's Disease. Mean age was 41, 8 years (Sd. 20,5); there were 9 females and 12 males. Twelve patients were admitted in emergency setting (57.1%). In this group, average pre-intervention hospital stay was 12 days (Sd 6,3); between them, 9 patients underwent conservative approach and finally underwent surgery because persistence of strictures and occlusive picture, diagnosed with MRE; 3 patients needed an urgent operation to obtain sepsis control. Mannheim Peritonitis Index in patients undergoing elective procedure, emergency conservative treatment and then surgery and immediate surgery were respectively 18, 22 and 23. Converting data with the modern World Society of Emergency Surgery (WSES) Sepsis Severity Score were obtained values of 8, 11, and 14 [9]. Patient's characteristics are shown in (Table 1). American Society of Anesthesiology (ASA) score was 2 in 6 patients, 3 in 12 cases and 4 in 3 of them. Conversion rate from laparoscopic (LP) to open surgery was 19.1% (4 patients); mean operating room (OR) time, both for emergency and elective operations, was 154 minutes (Sd 39,5) and 147 minutes (Sd 33,8) for the 17 patients not converted to open. Average length of resected bowel was 30.4 cm (Sd 13,8).

Total morbidity rate due to surgical complications was 14.09% (4 patients). Two had wound infection, managed with frequent dressing changes in outpatient setting and healing by secondary intention. One (4.8%) underwent reoperation in fourth POD for persistent moderate bleeding causing anemia (Hb 7.9 g/dl in spite of one unit of blood transfusion). The patient underwent exploratory re-laparoscopy and, after accurate lavage, bleeding was found coming from the anastomotic staple line, than a few stitches were laparoscopically placed in order to successfully control it. In another case reoperation was necessary for anastomotic leakage and sepsis onset in fifth POD. Therefore, global reoperation rate was 9.5%. No other complications were recorded. Results and postoperative complications are summarized in (Table 2). Finally, mean post-operative hospital stay was 6, 8 days (Sd 1,8) in uncomplicated cases, and extended to 14 days (Sd 4,3) in reoperated patients. No mortality was recorded.

Discussion

Although Crohn's usually improves with conservative therapy, a lot of patients, sooner or later during their life, will have to undergo surgical treatment [10]. Many patients, in spite of emergency admission, quickly improve with conservative approach, while some others need surgical treatment. When is possible to plan the operation, it is important to improve both local and general patient conditions, in order to minimize any post-operative complications. Antibiotics, anti-inflammatory drugs, drainage of abdominal collections together with bowel rest with total parenteral nutrition can improve patient's performance status, together with nutritional and immunological conditions [11]. Generally, strictures are one of the most frequent indications to surgery, others are fistulas or abscesses causing local or diffuse peritonitis [12]. The obstructed tract often involves the ileo-cecal junction; in these cases ileo-cecectomy is indicated [13]. Resection has to be performed trying to avoid extensive intestinal resection, therefore an accurate assessment of the CD localization is recommended, together with the evaluation of its activity degree. [14,15]. In these patients laparoscopy can offer the advantages related to minimal invasiveness and, in our experience, also allow to perform a bowel sparring technique. When mesenteric thickness makes the resection difficult, exteriorization through a transverse mini-laparotomy of the mobilized bowel allows performing both manual vascular ligation close to the bowel wall, and the ileo-colonic anastomosis. This technique needs only three port access, like many other surgical procedures [16,17]. In our series, anastomosis was performed in antiperistaltic fashion with a linear mechanical stapler (Touchstone LC 80), using the 38 mm 'blue' cartridge. Only in one case the 45 mm 'green' cartridge was used because of important and diffuse thickness of the entire bowel wall secondary to edema; this case was complicated by a moderate bleeding by suture line, needing reoperation. Perhaps, also in this case, we should have used the 38 mm cartridge. These data are similar to other reports about peri-operative complications in CD. A recent metanalysis [18] shows that anastomotic leak rate ranges from 0 to 7.1% (4.8% in our series) whilst other complications, so called "other than anastomotic leak", can reach 10.4% (9.5% in our study, excluding the 2 wound infections). In our series, pathological report of the patient undergoing reoperation for anastomotic leak, showed local activity of Crohn's, unfortunately unrecognized during surgery because of the emergency approach, which didn't allow an adequate evaluation of the disease extension in the small bowel. After an additional resection with re-anastomosis, the septic complication resolved and the patient went home in 15th POD.

In our experience, bowel externalization before resection trough a mini-laparotomy in the right flank does not reduce the advantages of laparoscopy and allows performing a better bowel saving technique due to hand ligation of vessels, very close to the bowel wall. In

Table 2: Results. OR: operating room, UTI: urinary tract infection.

Population	Number (21)
Conversion from laparoscopic to open	4 (19.1%)
OR time, mean, minutes All patients Laparoscopic cases	 154 147
Length of resected bowel, mean, cm	30.4
Reoperation, total number of patients For bleeding For anastomotic leak	2 (9.5%) 1 1
Other complications Wound infection UTI Pneumonia	
Length of hospital stay, days No complications Reported patients	 6.8 14

the international literature there is a widespread agreement that laparoscopic approach decreases peri-operative complications and incisional hernia rate in comparison to open surgery [19]. Moreover, stapled side-to-side anastomosis guarantees a lower number of anastomotic leaks [18].

In 2006, a meta-analysis collecting data from 20 studies showed that laparoscopy is a valid alternative to open surgery. In this paper, laparoscopic approach had longer operative time but, in terms of intraoperative bleeding and complications, laparoscopic and open group were fairly consistent; furthermore, postoperative hospital stay was significantly shorter in the laparoscopic group as the recovery of bowel functions occurred earlier. These data are supported by several other reports confirming that laparoscopic resection offers substantial advantages in terms of post-operative recovery and reduced hospital stay [20-21]. Laparoscopy should be the method of choice especially in young patients that probably will have to undergo other surgical operations among their life; in fact, the reduced adhesions formation due to less bowel manipulation can provide easier future laparoscopic access [22]. Good evidences, finally, are present in literature in favor of stapled side-to-side anastomosis in terms of perioperative complications and long-term recurrences.

Conclusion

Terminal ileum is the most involved tract in Crohn's disease and its obstruction is one of the most frequent complications. In this scenario, laparoscopic ileo-cecectomy with stapled extracorporeal side-to-side anastomosis seems to be an easy, reproducible and safe technique, in spite of the well known fistulizing nature of the disease.

References

1. Siassi M, Weiger A, Hohenberger W, Kessler H. Changes in surgical therapy for Crohn's disease over 33 years: a prospective longitudinal study. Int J Colorectal Dis. 2007; 22: 319-324.
2. Radford-Smith GL. What is the importance of appendectomy in the natural history of IBD? Inflamm Bowel Dis. 2008; 14: S72-S74.
3. Di Fede G, Bronte G, Rizzo S, Rolfo Cervetto C, Cococrullo G, Gulotta G, et al. Monoclonal antibodies and antibody fragments: state of the art and future perspectives in the treatment of non hematological tumors. Expert Opin Biol Ther. 2011; 11: 1433-1445.
4. Renna S, Cottone M, Orlando A. Optimization of the treatment with immunosuppressants and biologics in inflammatory bowel disease. World J Gastroenterol. 2014; 20: 9675-9690.
5. Cappello M, Bravatà I, Cocorullo G, Cacciatore M, Florena AM. Splenic littoral cell hemangioendothelioma in a patient with Crohn's disease previously treated with immunomodulators and anti-TNF agents: a rare tumor linked to deep immunosuppression. American J Gastroenterol. 2011; 106: 1863-1865.
6. Podolsky DK. Inflammatory bowel disease. N Engl J Med. 2002; 347: 417-429.
7. Best WR, Becktel JM, Singleton JW, Kern F Jr. Development of a Crohn's disease activity index. National Cooperative Crohn's Disease Study. Gastroenterology. 1976; 70: 439-444.
8. Giaccaglia V, Antonelli Ms, Addario Chieco P, Cocorullo G, Cavallini M, Gulotta G. Technical characteristics can make the difference in a surgical linear stapler. Or not? J Surg Res Jul. 2015; 197: 101-106.
9. Sartelli M, Abu-Zidan FM, Catena F, Griffiths EA, Di Saverio S, Coimbra R, et al. Global validation of the WSES Sepsis Severity Score for patients with complicated intra-abdominal infections: a prospective multicentre study (WISS study). World J Emerg Surg. 2015; 10: 61.
10. Yamamoto T. Factors affecting recurrence after surgery for Crohn's Disease. World J Gastroenterol. 2005; 11: 3971-3979.
11. Kala Z, Marek F, Válek VA, Bartušek D. [Crohn's disease surgery]. Vnitr Lek. 2013; 60: 617-623.
12. Seifarth C, Kreis ME, Grone J. Indications and specific surgical techniques in Crohn's Disease. Viszeralmedizin. 2015; 31: 273-279.
13. Vettoretto N, Gazzola L, Giovanetti M. Emergency laparoscopic ileocecal resection for Crohn's acute obstruction. JSLS. 2013; 17: 499-542.
14. Nahon S, Bouhnik Y, Lavergne-Slove A, Bitoun A, Panis Y, Valleur P, et al. Colonoscopy accurately predicts the anatomical severity of colonic Crohn's disease attacks: correlation with findings from colectomy specimens. American J Gastroenterol. 2002; 97: 3102-3107.
15. Pera A, Bellando P, Caldera D, Ponti V, Astegiano M, Barletti C, et al. Colonoscopy in inflammatory bowel disease. Diagnostic accuracy and proposal of an endoscopic score. Gastroenterology. 1987; 92: 181-185.
16. Agrusa A, Romano G, Cucinella G, Cocorullo G, Bonventre S, Salamone G, et al. Laparoscopic three port and SILS cholecystectomy: a retrospective study. G Chir. 2013; 34: 249-253.
17. Cocorullo G, Tutino R, Falco N, Salamone G, Gulotta G. Three port colectomy: reduced port laparoscopy for general surgeons. A single center experience. Ann Ital Chir. 2016; 87: 350-355.
18. He X, Chen Z, Huang J, Lian L, Rouniyar S, Wu X, et al. Stapled side-to-side anastomosis might be better than handsewn end-to-end anastomosis in ileocolic resection for Crohn's Disease: a metanalysis. Dig Dis Sci. 2014; 59: 1544-1551.
19. Patel SV, Patel SV, Ramagopalan SV, Ott MC. Laparoscopic surgery for Crohn's Disease: a metanalysjs of perioperative complications and long-term outcomes compared with open surgery. BMC Surg. 2013; 13: 14.
20. Tilney HS, Constantinides VA, Heriot AG, Nicolaou M, Athanasiou T, Ziprin P, et al. Comparison of laparoscopic and open ileocecal resection for Crohn's disease: a metaanalysis. Surg Endosc. 2006; 20: 1036-1044.
21. Tavernier M, Lebreton G, Alves A. Laparoscopic surgery for complex Crohn's disease. J Visc Surg. 2013; 150: 389-393.
22. Basile G, Chiarenza S, Di Mari P, Leanza S, Boscarelli G, Buffone A. Crohn's disease in the elderly. Ann Ital Chir. 2006; 77: 247-251.