

## Laparoscopic ileocecal resection in acute and chronic presentations of Crohn's disease. A single center experience

G. COCORULLO, R. TUTINO, N. FALCO, G. SALAMONE, T. FONTANA, L. LICARI, G. GULOTTA

**SUMMARY: Laparoscopic ileocecal resection in acute and chronic presentations of Crohn's disease. A single center experience.**

G. COCORULLO, R. TUTINO, N. FALCO, G. SALAMONE, T. FONTANA, L. LICARI, G. GULOTTA

*Introduction. The terminal ileum is the most involved tract in Crohn's disease. The obstruction in this location is the most frequent complication. Acute or chronic presentations can occur.*

*Surgery finds a role in the management of chronic strictures and in acute clinical presentations with complications not improving with conservative therapy.*

*Patients and methods. We investigate the outcome of patients with obstruction of the ileo-cecal bowel tract laparoscopically managed. It was analyzed the average operative time (OT), the conversion rate and the occurrence of re-operation due to surgical complications.*

*Results. 21 patients underwent an ileocecal resection for compli-*

*cated Crohn's disease between January 2013 and December 2014. The admissions were performed in emergency in 42% of patients. The pre-intervention hospital stay was 5.8 (Sd 6.23). The mean operative time was 154 min (Sd 41). 28% of the procedures were converted to open surgery. The average hospital stay was 10 days (Sd 5) in uncomplicated patients. The morbidity rate was 28%. In 19% of cases a re-intervention was needed due to anastomotic leakage (3pts) and one hemo-peritoneum for bleeding from the suture line.*

*Discussion. Laparoscopy seems an affordable technique in the management of obstructive pattern of Crohn's disease. It should be the preferable approach in young patients that probably will be submitted to subsequent surgery for the same disease; in fact, the reduced adhesions formation provided by the less bowel manipulation make easy the subsequent access.*

*Older patients had usually more post-operative morbidity and mortality mostly due to pre-existing conditions; if possible in these patients the treatment should be medical.*

KEY WORDS: Crohn disease - Laparoscopy - Surgical anastomosis.

### Introduction

Surgery finds in Crohn's disease a main role in the management of obstructive or septic complications. Of course, to reserve it as the last treatment to use whenever medical therapy alone is insufficient, results in performing an intervention on more serious patients with more surgical complications (1-3).

Through the years, granulomatous enteritis can develop a scar thickening with tight stenosis and a progressive obstructive course which finally requires a planned surgical intervention.

Elective surgical treatments are proposed in patients with sub-occlusive presentation due to strictures, chronic fistulas or with high CD index (>220) with a terminal ileum-cecum disease (4).

Among the complications of the disease acute intestinal obstruction is the most frequent; the 35-54% of these cases involving the terminal ileum that is moreover the most frequent tract involved by the disease; digiunal (22-36%) or colonic disease (5-17%) can cause an occlusive framework, too (5). Firstly medical therapy is anyway attempted in the management of acute obstructions if peritonitis or fever does not income (4).

The resection of the terminal ileum and cecum is the most widespread intervention in these cases and it is performed both for acute disease non responder to medical therapy and for advanced disease.

Right hemicolectomies or more extensive resections are often not needed while harmful, so these are not recommended (1, 4).

Minimally invasive laparoscopic treatments find today an important role in the treatment of CD.

Department of Surgical, Oncological and Oral Sciences, University of Palermo, General Surgery and Emergency Operative Unit, University Hospital "P. Giaccone", Palermo, Italy

Corresponding author: Roberta Tutino, e-mail: la.tutino@gmail.com

© Copyright 2016, CIC Edizioni Internazionali, Roma

The aim of this study is to investigate the safety and effectiveness of the laparoscopic approach in performing ileocecal resection for Crohn's disease.

## Patients and methods

A retrospective study was carried out through the analysis of patients treated with laparoscopic ileocecal resection for Crohn disease in the Emergency and General Surgery Operative Unit of the University Hospital "Paolo Giaccone", Palermo, from January 2013 to December 2014.

Data on patients were collected from the hospital database and from the patient schedules and analyzed using frequencies and percentages.

Patients' admission diagnoses, their ASA score and the admission modality (emergency or elective) were analyzed.

The average operative time (OT), the conversion rate and the occurrence of re-interventions due to surgical complications were analyzed.

### *Surgical technique*

The laparoscopic approach to ileocecal resection starts with positioning three to four trocars: a peri-umbilical 10/12 mm. camera port, a 10 mm. operative port in the left ipocondrium and one or two 5 mm. ports respectively located in the left iliac fossa and right flank.

A careful evaluation of the entire bowel is firstly performed to underline the presence of the stricture and the probable others stenotic tracts. The dissection of the terminal ileum and the cecum is performed and the mesenteric resection is done with the vascular ligation performed more distally from the origin of the vessels than in oncologic resections. This procedure allows preserving the vascularization of the remaining bowel to avoid ischemic complications even it is sometimes difficult to perform laparoscopically due to the thickness of the mesentery.

The resection and anastomosis are usually performed in an extracorporeal fashion through a short transverse laparotomy done in the right flank. Resection is performed with a linear stapler and anastomosis is done side by side anti-peristaltic, preferably handly, sometimes with a linear stapler. Usually a drain is left in the abdominal cavity and removed in fourth to sixth post-operative days.

### *Peri-operative patient management*

In emergency admission patients are evaluated by a multi-disciplinary team and their conditions are improved by antibiotic therapy and parenteral nutrition. If collections are present these are drained by an interventional radiologist and a first non-operative management is usually offered. As patient's conditions do not improve and

an obstructive pattern is still present a surgical resection is needed.

In case of acute presentations in planned resection for chronic strictures the management is usually faster.

A nose-gastric tube is positioned in the operative room and removed in second post-operative day (PO). Patients are nourished with parenteral nutrition until the first bowel sound or often in the fourth PO. Antibiotic therapy is administered with a regimen of ciprofloxacin 500 mg/bid and metronidazole 500 mg three times a day. Analgesic therapy is administered. Patients are mobilized since the first PO and bowel sounds usually are present in the second PO. The patient is discharged in the sixth PO if complications do not occur.

## Results

21 patients underwent an ileocecal resection for complicated Crohn's disease between January 2013 and December 2014. The average age of patients was 42.9 (Sd. 21.6). There were 9 females and 12 males. Patients came to the General Surgery and Emergency Division of the University Hospital of Palermo with several admission diagnoses such as acute abdomen, bowel obstruction, abdominal pain, and so on. The admissions were performed in emergency in 42%. The pre-intervention hospital stay was 5.8 days (Sd 6.23). Patients' mode ASA score was 3. The average operative time was 154 min (Sd 41). 28% of the procedures were converted to open surgery. The average length of resected bowel was 30 cm. (Sd 14.5). The average hospital stay was 10 days (Sd 5) in uncomplicated patients. The morbidity rate was 28%, in 19% of patients due to anastomotic leakage (3pts). In one case of hemoperitoneum from the suture line a re-intervention was needed.

## Discussion and conclusions

Generally, bowel strictures are the most frequent indications of surgical treatment; however intraoperative previously undiagnosed findings can be found, such as the presence of fistulas or abscesses.

The obstructed tract often comprises the cecum and the terminal ileum; in these cases it is necessary an ileocecal resection (6).

The correct localization of CD and the evaluation of its activity degree play an indispensable role to choose the right treatment for medical or surgical therapy (7).

When possible, it is important to improve both local and general patient conditions in order to minimize any post-operative complications. The use of anti-inflammatory drugs and the drainage of abdominal collections, together with bowel rest and the administration

of parenteral nutrition can improve the patient performance status concerning nutritional and immunological conditions (8).

The pre-operative hospital stay was 6 days. 60% of patients managed by surgery were admitted in emergency.

Laparoscopic surgery provides several advantages that have to be considered when planning and selecting the preferable approach for patients; thus video-assisted surgery is preferable to open surgery, except in complex cases or in recurrent resections.

Some reports relate that laparoscopic surgery shows lower morbidity and mortality rates, faster recovery of intestinal motility, lower postoperative admission times, lower adhesional syndromes and lower rates of incisional hernias (4, 9-15).

Reviewing a series of open managed patients in our O.U., we did not find statistical differences among morbidity rate, hospital stay and operative time between laparoscopy and open resection in our series.

Of course the complexity of these cases and the several clinical presentations need a proper multidisciplinary team with skills in medical, peri-operative and surgical management. Moreover skills in advanced laparoscopy should be needed.

In a review of the literature that collected data from 20 studies, it merges that laparoscopy is a valid alternative to open surgery. An analysis, performed on 783 patients, 338 (43.2%) of whom underwent laparoscopic ileocecal resection, shows longer operative time in case of laparoscopic approach. In terms of intraoperative bleeding and complications, laparoscopic and open group were fairly consistent; postoperative hospital stay was significantly shorter in the laparoscopic series as the recovery of bowel sounds occurs earlier; finally complications were comparable (10).

These results confirmed the safety of the procedure (9-15), so the laparoscopic surgical approach to CD had been fully embraced by our division beside the open one.

Of course CD laparoscopic surgery suffers for the presence of a reduced tactile feedback that could hinder the identification of strictures.

Moreover, the thickening of the mesentery in the suffering tracts can make difficult the resection. To overcome these problems we usually perform the intervention with a three port technique as described for other diseases (16, 17) and exteriorize the narrow tracts to perform resection and anastomosis through a transverse mini-laparotomy.

The use of staplers in CD is described even if mechanical anastomosis in thickened bowel walls could present some risks (18).

We perform both handly and stapled anastomosis depending on the specific case and surgeon preference even if the occurrence of bleeding from the suture line in two cases could suggest an handly sutures to better manage the different tissues thickening.

Laparoscopy should be preferable in young patients that probably will be submitted to subsequent surgery for the same disease. In fact, the reduced adhesions formation provided by the less bowel manipulation can make easy the subsequent access.

Older patients had usually more post-operative morbidity and mortality in CD, mostly related to pre-existing conditions; if possible in these patients the treatment should be medical (19-21). Surgery if necessary should be the most conservative possible and laparoscopy allowing early recovery could reduce the post-operative sequelae also in elderlies if no contraindications to the pneumoperitoneum exist.

## References

1. Cocorullo G, Fontana T, Falco N, et al. Surgery and Crohn's Disease. In *Crohn's Disease*. Springer International Publishing. 2016:147-151.
2. Cocorullo G, Falco N, Fontana T, et al. Diagnostic and Therapeutic Role of Endoscopy in Crohn's Disease. In *Crohn's Disease*. Springer International Publishing. 2016:43-47.
3. Cocorullo G, Tutino R, Falco N, et al. Surgical Emergencies in Crohn's Disease. In *Crohn's Disease*. Springer International Publishing. 2016:153-157.
4. 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(3):319-324.
5. Radford-Smith GL. What is the importance of appendectomy in the natural history of IBD? *Inflamm Bowel Dis*. 2008;14(S2):72-74.
6. Vettoretto N, Gazzola L, Giovanetti M. Emergency laparoscopic ileocecal resection for Crohn's acute obstruction. *JLS*. 2013;17(3):499.
7. Nahon S, Bouhnik Y, Lavergne-Slove A, et al. Colonoscopy accurately predicts the anatomical severity of colonic Crohn's disease attacks: correlation with findings from colectomy specimens. *Am J Gastroenterol*. 2002;97(12):3102-3107.
8. Kala Z, Marek F, Válek VA, Bartušek D. Crohn's disease surgery. *Vnitřní lékařství*. 2013;60(7-8):617-623.
9. Agresta F, Ansaloni L, Baiocchi GL, et al. Laparoscopic approach to acute abdomen from the Consensus Development Conference of the Società Italiana di Chirurgia Endoscopica e nuove tecnologie (SICE), Associazione Chirurghi Ospedalieri Italiani (ACOI), Società Italiana di Chirurgia (SIC), Società Italiana di Chirurgia d'Urgenza e del Trauma (SICUT), Società Italiana di Chirurgia nell'Ospedalità Privata (SICOP), and the European Association for Endoscopic Surgery (EAES). *Surg Endosc*. 2012;26(8):2134-2164.



*Laparoscopic ileocecal resection in acute and chronic presentations of Crohn's disease. A single center experience*

10. Tilney HS, Constantinides VA, Heriot AG, et al. Comparison of laparoscopic and open ileocecal resection for Crohn's disease: a meta-analysis. *Surg Endosc.* 2006;20(7):1036-1044.
11. Buunen M, Veldkamp R, Hop WC, et al. Colon Cancer Laparoscopic or Open Resection Study Group: Survival after laparoscopic surgery versus open surgery for colon cancer: long-term outcome of a randomised clinical trial. *Lancet Oncol.* 2009;10(1):44-52.
12. Veldkamp R, Gholghesaei M, Bonjer HJ, et al. Laparoscopic resection of colon cancer: consensus of the European Association of Endoscopic Surgery (EAES). *Surg Endosc.* 2004;18(8):1163-1185.
13. Simon T, Orangio GR, Ambroze WL, et al. Factors associated with complications of open versus laparoscopic sigmoid resection for diverticulitis. *JLS.* 2005;9(1):63.
14. Sun J, Jiang T, Qiu Z, et al. Short-term and medium-term clinical outcomes of laparoscopic-assisted and open surgery for colorectal cancer: a single center retrospective case-control study. *BMC gastroenterol.* 2011;11(1):85.
15. Tavernier M, Lebreton G, Alves A. Laparoscopic surgery for complex Crohn's disease. *J Visc Surg.* 2013;150(6):389-393.
16. Agrusa A, Romano G, Cucinella G, et al. Laparoscopic, three-port and SILS cholecystectomy: a retrospective study. *G Chir.* 2013;34(9-10):249-253.
17. Cocorullo G, Tutino R, Falco N, Salamone G, Gulotta G. Three-port colectomy: reduced port laparoscopy for general surgeons. *Ann Ital Chir.* 2016;10:87. pii: S0003469X16024891.
18. Giaccaglia V, Antonelli MS, Chieco PA, Cocorullo G, Cavallini M, Gulotta G. Technical characteristics can make the difference in a surgical linear stapler. Or not? *J Surg Res.* 2015;197(1):101-106.
19. Basile G, Chiarenza S, Di Mari P, Leanza S, Boscarelli G, Buffone A. La malattia di Crohn nell'anziano. *Ann Ital Chir.* 2006;77(3):247.
20. 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. *Am J Gastroenterol.* 2011;106(10):1863.
21. Sartelli M, Abu-Zidan FM, Catena F, 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(1):1.

