

Minimally invasive ileocecal valve resection in ileocecal Crohn's disease



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Giacomo Benassai*, Carlo Serra*, Gregorio Romeo*, Francesca Calemma*, Francesco Maione*, Mariarosaria Portinaio*, Marianna Scevola**, Gianluca Benassai*, Gennaro Quarto*

*Department of Clinical Medicine and Surgery, "Federico II", D.A.A.I. Integrated activity care department of digestive system disease.
Director: Giovanni D. De Palma, Naples, Italy

**Vascular Surgery Unit, A.O.U. Molinette Hospital, Città della Salute e della Scienza, Turin, Italy

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AIM: Considering ileocolic resection as a surgical standard for the treatment of ileocecal valve Crohn's disease, we propose a limited resection of the terminal ileum and ileocecal valve with ileocecal anastomosis.

Material of Study: Three patients between 20 and 37 years of age, diagnosed with Crohn's disease unresponsive to medical therapy, who have stenoses or fissures confined to the terminal ileum and ileocecal valve, seen during instrumental investigations.

RESULTS: The proposed procedure allowed us to perform a minimal resection and reconstruction of a new ileocecal valve. Once the symptoms have resolved, at endoscopic follow ups, at 6 and 12 months after surgery, there were no changes in the mucosa of the ileocecal neo-anastomosis.

DISCUSSION: Since Crohn's disease is a systemic disease with a chronic relapsing course complicated by a high rate of post-surgical relapses, it is essential to limit the extension of resections to the macroscopically involved tissues and reduce the anastomotic surfaces. The proposed surgical procedure allows to preserve the caecum and the colon with an optimal postoperative course.

CONCLUSION: We believe that, with specific clinical and endoscopic conditions, the treatment we illustrated can be proposed to other patients as an alternative to the standard VL ileocolic resection.

KEY WORDS: Crohn's Disease, Ileocaecal Valve, Ileocaecal Anastomosis

Introduction

Crohn's disease (CD) is a chronic inflammatory bowel disease (IBD) with a multifactorial etiopathogenesis, which can be classified in the context of connective tissue disorders. In fact, current knowledge suggests that CD in genetically predisposed individuals results from a deranged immune response to environmental factors¹. It has two peaks of incidence: the first between 20 and 30 years of age and the second between 60 and 70.

According to the Montreal classification, CD is differentiated into three disease profiles: non stricturing/non penetrating, stricturing, penetrating \pm perianal disease². CD often has an insidious onset with a chronic recurrent course, in which symptomatic periods are defined by abdominal pain, diarrhea (present in at least 85% of patients³) and weight loss. The disease is limited to the ileocolic tract in 45% of cases, in 20% to the ileum only and in 35% to the colon alone⁵. Extra-intestinal manifestations are also quite common, usually involving the skin, eyes and joints, demonstrating that CD must be considered a systemic disorder⁴.

MOLECULAR PATHOLOGY

The etiopathogenesis of CD is not clear and the mechanisms of the immune system deregulation that leads to this disease are not fully understood. It has been shown

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Correspondence to: Prof. Giacomo Benassai, Università degli Studi di Napoli, D.A.I. Malattie del Sistema Digestivo, Via Cotronei 1, 80129 Napoli, Italia (e-mail: gbenassa@unina.it)

that first degree relatives of affected individuals have a higher risk of developing the disease, hinting to genetic factors contributing to CD⁶. Furthermore, in about one third of patients there is a mutation of the NOD2 / CARD15 gene, expressed in monocytes, macrophages and Paneth cells, which codes for a protein that, modulating the activation of NF- κ B, regulates the immune response against the intestinal flora⁷. This mutation triggers a pathological inflammatory response which, together with the activation of Th-1 type immune cells, leads to the release of inflammatory mediators such as TNF- α and interferon- γ . These proteins are the targets of the most recently used biological drugs. Another element in the pathogenesis of CD lies in an alteration of tight junctions in the intestinal epithelium that modulating both innate and adaptive immune responses can increase the risk of developing the disease⁸. CD recognizes specific environmental factors that span from prenatal events, breastfeeding and childhood infections to smoking habit, diet, hygiene, pollution, stress and appendectomy. Cigarette smoking is the most significant factor, associated with a 2.5 to 3 fold relative risk, a more severe clinical course and an earlier post-surgical recurrence⁹.

PATHOLOGICAL ANATOMY

The disease is located in 45% of cases to the ileocolic tract, in 20% of cases to the ileum and in 35% of cases to the colon only⁵. Anal and perianal regions are frequently affected, while involvement of the esophagogastrroduodenal tract is rarer. CD shows a characteristic patchy distribution with sharply delineated areas of disease surrounded by relatively normal mucosa. Macroscopically a rigid thickening of the intestinal segment involved, secondary to edema, inflammatory infiltration and fibrosis is observed. This process can lead to the formation of strictures, often localized in the terminal ileum, resulting in dilation of the proximal bowel loops. Aphthous ulcers can be found early in the disease, often converging to form long and serpiginous lesions as well as penetrating fissures. Ulcers and fissures are often in communication with each other and, surrounded by areas of edematous mucosa, they give rise to the typical "cobblestone" appearance. Extension of fissures and inflammation up to the serosa can cause adhesions and formation of fistulae that, when forming a communication with the mesentery, can result in the formation of abscesses. Following histological examination, non-necrotizing, epithelial-giant-cell granulomas are pathognomonic of CD.

CLINICAL PICTURE AND EVOLUTION

Crohn's disease exhibits a chronic recurrent course with intestinal symptoms often associated with extra intesti-

nal manifestations. In most cases, the onset is characterized by the classic "triad" of abdominal pain, diarrhea and weight loss, with or without low grade fever. Due to the unspecific nature of its presentation, a correct diagnosis can take up to several years¹⁰. Chronic diarrhea is the most frequent symptom of CD due to lesions or malabsorption in the ileal tract, while the presence of blood in faeces is associated with colic lesions. Abdominal pain is commonly localized in the mesogastrium and right iliac fossa, where painful abdominal masses can be found on palpation, secondary to intestinal wall thickening. Weight loss may be the result of a reduced caloric intake, increased consumption due to inflammation and malabsorption which frequently leads to anemia due to iron and vitamin deficiency. In some patients, classic symptoms may be heralded, even by years, by a perianal fistula that hardly heals spontaneously. CD complications are dictated to its anatomopathological features. The fibro-stenosing phenotype of the disease causes symptoms associated with intestinal occlusion or sub-occlusion, such as recurrent painful abdominal crises with or without nausea or vomiting and constipation or obstipation. In patients with a penetrating phenotype, the most common signs are enterointeric, enterocolic, entero-vesical or entero-cutaneous fistulae. In this case, one of the most severe complications is represented by the formation of abdomino-pelvic abscesses which can culminate in sepsis. In a minority of cases, local complications such as rectal abscesses, anal fissures and perianal fistula can hint towards the diagnosis of Crohn's disease.

CD also can be classified as a systemic collagenopathy, as ocular (uveitis, episcleritis, iridocyclitis), cutaneous (erythema nodosum, pyoderma gangrenosum), vascular (thromboembolism), articular and hepatobiliary extraintestinal manifestations are frequently found¹¹.

Diagnosis

The diagnosis of Crohn's disease should start from careful medical history assessment and a thorough physical examination, followed by laboratory and instrumental investigations. First of all, diarrhea, abdominal pain, rectal bleeding and weight loss should be looked for. Among the objective findings, fistulae, abscesses, bowel obstruction and the previously describe extraintestinal manifestations should arise suspicion of the disease. Physical examination must assess the presence of oral aphthous ulcers, abdominal masses, signs of perianal disease and nutritional deficiencies. Growth retardation is common in pediatric patients.

Laboratory Tests

With biochemical investigations it is possible to detect micro- or macrocytic hypochromic anemia.

In the active phase of the disease, leukocytosis, increased ESR and CRP are common. Severe malnutrition, malabsorption and chronic diarrhea are associated, respectively, with hypoalbuminemia, hypotryglyceridemia and electrolyte disturbances. The positivity of ASCA2 antibodies is detectable in 50-70% of patients with Crohn's, moreover the combination of ASCA + and ANCA- has a positive predictive value of more than 90%¹². Stool test is required to rule out Salmonella, Shigella and Clostridium difficile infections. The suspicion of IBD is also strongly supported by the increase concentration of fecal calprotectin¹³⁻¹⁴.

Instrumental Investigations

Colonoscopy with retrograde ileoscopy allows for direct visualization of the intestinal mucosa and in obtaining biopsy tissue. It is the sole method for a reliable histological evaluation, to assess the severity and the extent of the disease and to monitor patients for an increased risk of colorectal cancer. The involvement of the small intestine, the presence of "skip" lesions and complications such as strictures or fistula should direct to the diagnosis of Crohn's disease rather than ulcerative colitis¹⁵.

CD with a more severe evolution presents with a typical discontinuous pattern of involvement, in which affected areas (bleeding lesions, ulcers and fissures) are interspersed with normal tissue.

Following the European ECCO4 guidelines, all patients diagnosed with Crohn's disease should undergo an endoscopic examination of the upper digestive tract (EGDS). The endoscopic capsule is helpful to examine the intestine at the ileal level but it is contraindicated in the presence of a stricturing phenotype due to the risk of occlusions. In this case, radiological investigations can be a valid alternative to support or confirm the diagnosis of CD.

Abdominal ultrasound (US) allows a direct evaluation of the intra and extra-mural intestinal lesions. The most frequent ultrasound finding is transmural wall thickening deriving from inflammation, oedema and the subsequent fibrosis¹⁶. As said, patients with a stenosing phenotype often present an intestinal wall thickening with dilation of the proximal bowel loops. US is also useful in detecting complications. Fistulae appear as serpiginous hypochoic tracts that connect the intestinal loops or a loop with other adjacent structures. Abscesses have a heterogeneous appearance depending on the evolutionary stage. Entero-CT has a very high sensitivity and provides information about presence of intraluminal stenoses and proximal dilations as well as extramural complications (abscesses and fistulae). Moreover, it is often readily available in emergency situations.

Double-contrast MRI of the intestine is also informative in the imaging of small intestine, as it can evaluate

mucosal inflammation, wall thickening, increased bowel wall intensity, mesenteric vessels congestion, and lymph nodes enlargement. Dynamic sequences evaluation allows to precisely locate obstructions and it is also used in the follow-up of complications¹⁷.

Abdominal X-Ray is a low radiation dose, fast examination, still useful in cases of suspected occlusion or intestinal perforation, demonstrated by hydro-aerial levels and ileal loops distension.

MEDICAL THERAPY

Nowadays there is non definitive intervention for Crohn's disease, therefore the purpose of treatment is to control symptoms, induce clinical remission and prevent relapse. This is achieved through medical and surgical therapy often coupled with necessary lifestyle changes. Dietary adjustments are the first line of treatment, with small but frequent daily meals, low fiber foods, proper hydration and the use of food supplements for anyone who undergoes bowel resection. Smoking cessation can limit frequency¹⁸ and severity of relapses.

Anti-inflammatory and immunomodulating drugs are the mainstay of medical therapy. In the acute phases and if fistulae are presents, antibiotics (metronidazole and ciprofloxacin) are used for the prevention of infections. Corticosteroids are the most effective drugs in the active phases of moderate-severe disease, particularly budesonide (topical action) and prednisone (systemic action). However, in addition to the well known systemic side effects, corticosteroid treatment is hampered by the onset of dependence or refractoriness to therapy; compromising their effectiveness in maintenance phases¹⁹. In mild forms, aminosalicylates (mesalazine and sulfasalazine) can be used as an alternative. Mesalazine is preferable in case of ileocolic location, on the other hand sulfasalazine is more effective in the colon-only form of CD. The most commonly used immunosuppressive drugs in Crohn's are methotrexate, azathioprine and its active metabolite 6-mercaptopurine (thiopurine). These molecule are useful as maintenance therapy and for inducing remission in patients with steroid dependence or resistance²⁰.

Infliximab is the most used biological drug, a high affinity TNF- α binding monoclonal antibody that neutralizes its biological activity. Intravenous administration of these drugs can induce clinical remission and in some cases even a mucosal response in patients refractory to conventional therapies²¹. Alternatively, Adalimumab is a human anti-TNF- α antibody, effective in both induction and maintenance phases and administered subcutaneously. In recent years, Vedolizumab a new human monoclonal antibody targeting integrin $\alpha 4\beta 7$ (expressed on the surface of intestinal lymphocytes) has been introduced and has shown a high selectivity of action in the intestine²². Vedolizumab is recommended in patients with moderately or severely active CD who had

inadequate response, loss of response or presented with intolerance to conventional therapy or another biological drug.

Clinical response to drugs can be assessed with several disease activity indexes, the most used of which is the Crohn's disease activity index (CDAI). It monitors the clinical course of Crohn's disease by giving scores to eight parameters with different specific weight and adding them up²³. Depending on the resulting score, it is possible to identify patients in remission (<150) or in active phase (> 150), the latter being further sortable into mild, moderate or severe. The trend of the score over time allows for continuous evaluation of the course of the disease²⁴.

SURGICAL TREATMENT

Indications for surgery in CD include acute and chronic complications and failure of medical therapy. Surgical intervention is mandatory in the presence of intestinal obstruction, perforation or abscess, haemorrhage and toxic colitis. Chronic intestinal stenosis, cancerization, intolerance to medical therapy and fistulization are the most frequent chronic complications. In the non-stricturing phenotype, an early surgical approach aimed at cytoreduction favors the effectiveness of a subsequent biological therapy for the remission of the disease in an active state²⁵. Surgery, is also considered as an alternative to medical therapy for short fibrotic stenoses limited to the ileocolic level.

A recent study has shown that, in case of failure of conventional therapy, minimally invasive ileocecal resection is a valid alternative to the use of infliximab in cases of a localized (<40cm) inflammation, with only a quarter of patients being dependent to biological therapy within 2 years after surgery²⁶.

Given the high rate of post-operative relapses, surgery must be aimed at sparing as much bowel as possible, avoiding the risk of short bowel syndrome. For this reason, minimal resection and stricturoplasty are common clinical practice²⁷⁻²⁸. Resection is carried out with healthy margins 2-3 cm from the macroscopic lesions, while stricturoplasty completely avoid resection and shortening of the bowel. About 50% of patients with Crohn's disease undergo bowel resection 10 years after its diagnosis. Furthermore, the risk of undergoing a second surgery at 5 years is 24.2% and increases up to 35% at 10 years.

In case of colic involvement, resection of the affected colon or the less demolitive segmental resections are performed. However, total colectomy is necessary when CD is refractory to medical therapy and involves the entire organ²⁹.

Abstention from cigarette smoking and treatment with mesalazine are recommended in the post-surgical phase in order to reduce the risk of relapse.

ILEOCECAL VALVE CD

Typically, ileocecal valve disease is characterized by localized pain in the lower right quadrant of the abdomen, diarrhea, fever, loss of appetite. Nausea and vomiting should arise suspicion of an obstruction³⁰ caused by progressive wall fibrosis of the last ileal loop when not responsive to medical treatment. In patients with symptoms and diagnostic findings indicative of intestinal obstruction, surgery is the only viable solution. In the last decade, the introduction of minimally invasive surgery, bowel-saving techniques and specific post-operative recovery programs have significantly improved the quality of surgery and perioperative management; resulting in earlier recovery, less morbidity and better long-term outcomes.

More specifically, CD with an activity confined to the ileocecal valve can be surgically treated with a rapid restoration of the quality of life³¹⁻³².

Ileocolic resection, especially in young patients, should be considered in cases where medical therapy has not induced remission of the active disease, in case of intestinal obstruction and in case of high risk of sepsis due to the presence of fistulas³³.

On the other hand, medical therapy with immunomodulatory drugs (anti-TNF) is necessary in the case of concomitant active perianal disease, severe extra-intestinal manifestations and comorbidities that have an autoimmune origin.

According to the literature, Crohn's disease limited to the ileocecal valve treated with ileocolic resection has shown clear advantages in terms of quality of life, cost-effectiveness and long-term risk of recurrence compared to medical therapy alone³⁴.

Case presentation

AIM OF STUDY

The main indications for surgery in patients with Crohn's disease are the failure of medical treatment, the presence of stenoses or the formation of fistulas or abscesses. About 50% of patients with Crohn's disease undergo bowel resection 10 years after its diagnosis³⁵. Furthermore, the risk of undergoing a second surgery at 5 years is 24.2% and increases up to 35% at 10 years³⁶.

Crohn's disease patients have a high risk of developing short bowel syndrome. This is due to the chronic-relapsing course of the disease which may result in many intestinal resections, more or less extensive depending on the extent of the disease. For this reason it is mandatory to save as much intestine as possible, removing just the affected section.

Ileocecal resection with ileocolic anastomosis is the most frequently performed surgery in the *localized* disease of

the terminal ileum and ileocecal valve. This technique involves resection of the affected ileal segment, the cecum and part of the ascending colon.

In the last three years, three patients with Crohn's disease localized to the terminal ileum came to our attention to AOU Federico II, Naples, Italy. After a careful evaluation in which both surgeons and endoscopists took part, supported by a literature review, we choose a minimally invasive videolaparoscopic procedure consisting of resection of the stenotic / fistulized terminal ileum, removal of the ileocecal valve and subsequent anastomosis aimed at reconstruction of the removed valve.

PATIENTS

Patient "A" was a 22 years old female, an active smoker (20 cigarettes / day), with suspected psoriasis arthritis. She presented to the ER for a suspected septic shock with acute abdominal symptoms, fever (38 °C) and vomiting. Total body CT scan reported concentric thickening and hyperemia of the mucosa of the last intestinal loop wall with associated ectasia. PET/CT scan showed a non-specific increase in metabolic activity in the same region. Colonoscopy demonstrated a rigid and substenotic ileocecal valve covered by intact mucosa, an hyperemic ileal mucosa with superficial erosions with a fibrinous bed, and a pinkish colic mucosa free from lesions. The entero-MRI showed a thickening of about 9mm of the walls of the last ileal loop for a longitudinal extension of 12 cm, including the valve, with severe reduction in the lumen diameter; marked dilation of the more proximal loops and moderate dilation of the distal loops; good colon distension, with no alteration of wall thickness and colic lumen. Intestinal US showed a picture comparable to MRI.

Symptoms persisted despite supportive treatment, aminosalicylates and metronidazole administration. Considering the refractoriness to medical treatment and the young age, according to NICE 2019 guidelines³⁷, a minimal bowel resection was indicated. The patient was therefore referred to the endoscopic surgery of our center.

A first pre-operative colonoscopy was performed which showed a rigid and deformed ileo-caecal valve, impassable even with a pediatric colonoscope. The histological examination of the valve shown a mild chronic inflammatory form of CD. Furthermore, a second pre-operative colonoscopy, demonstrated a retracted and ulcerated valve.

Patient "B" was a 31 years old female, smoker of 15 cigarettes / day with no signs of extraintestinal CD. She already underwent appendectomy at the age of 13. She reported pain in the right iliac fossa with mild, afternoon fever for at least 2 months and gradual but constant weight loss. Frequent diarrhea discharges with more than two episodes per day were reported. The US exam-

ination showed a slight thickening of the last ileal loops wall. The subsequent colonoscopy demonstrated a mild mucosal hyperemia of the ileocecal valve region as a result of previous appendectomy. In this patient the passage of the colonoscope in the last ileal loops was possible and biopsy samples were suggestive for the diagnosis of CD. Medical therapy with salicylates was started and was effective for 4 years. After this period, a relapse of symptoms with the addition of vomiting, abdominal distention and loss of appetite occurred. First-line treatment with salicylates was started with a subsequent 2 months period of corticosteroid therapy but was ineffective.

She therefore was readmitted and underwent a new colonoscopy that showed a stenotic and ulcerated ileocecal valve surrounded by an hyperemic caecal mucosa, without further signs of inflammation in the remaining colon. Valve crossing with a pediatric colonoscope was possible but difficult. Due to endoscopic findings and refractoriness to medical therapy, an ileal resection with removal and subsequent reconstruction of the ileocecal valve was indicated.

Patient "C" was a 37 years old male, former smoker of 20 cigarettes per day for 15 years. He presented to our clinic due to frequent abdominal pain, loss of appetite, nausea, and febrile episodes with chills. Blood tests were indicative of active inflammation. Antibiotic and anti-inflammatory therapy was started and an US evaluation of the abdomen was performed which showed the presence of an hypoechoic tract compatible with a large fissure near the last ileal loop. Entero-MRI confirmed the presence of a fissure in the context of eroded mucosa in the enteric segment corresponding to the last 8 cm of the distal ileum. Endoscopic examination showed an ileocecal valve with hyperemic and edematous mucosa. Histological examination of the cecum showed a mucosa free from inflammation; on the other hand, the material taken from the valvular and ileal mucosa demonstrated transmural inflammation with deep but spatially confined ulcers and non-necrotizing epithelial-giant cell granulomas.

After a period of about 3 months, due to the low responsiveness to medical therapy, the high risk of septic events and organ damage confined to the ileocecal level alone, an indication for surgery was given.

OPERATIVE PROCEDURE

All procedures were carried out with patient positioned supine. Pneumatic compression stockings were placed to reduce the risk of deep vein thrombosis. After induction of general anesthesia, nasogastric tube and bladder catheter are positioned. Pneumoperitoneum is induced through a Verres needle, maintaining a pressure of 14 mmHg. Trocars are then inserted: first, a 12mm trocar is placed in the sub / supraumbilical position. The



Fig. 1: Terminal stenotic ileus resection with Purstring 45mm.

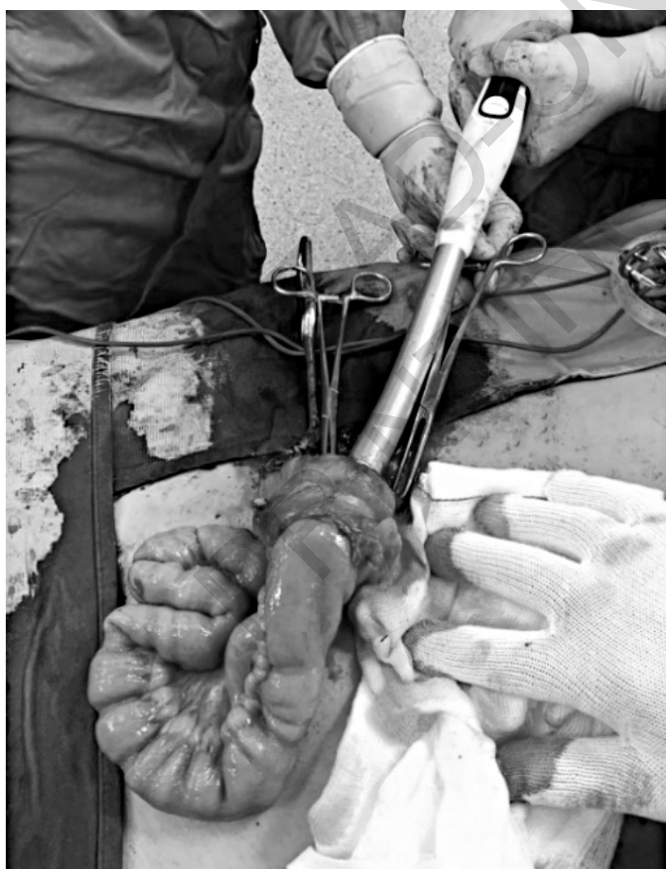


Fig. 2: After caecotomy, a circular suturing device is inserted to complete the ileocecal anastomosis.

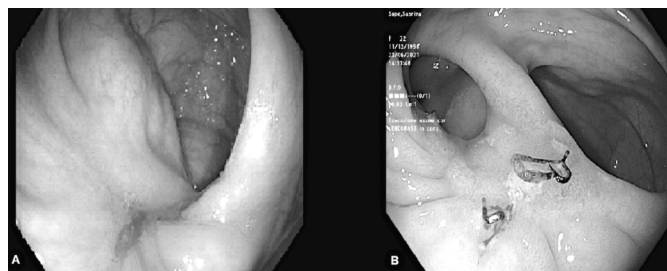


Fig. 3: A) Pre-operative colonoscopy; Visible ulceration at the ileocecal valve. B) Post-operative colonoscopy; the ileocecal neo anastomosis can be seen on the left, free from stenosis and inflammation.

30 °C optic is inserted through the sub-umbilical port and the abdomen is explored. Upon exploration of the peritoneal cavity, serous reactive fluid was observed in all 3 patients. A 12mm port is inserted in the left iliac fossa for the camera and a third 5mm dissection trocar in the left hypochondrium.

In patient B, who had already undergone open appendectomy, adhesions were found. Adhesiolysis using an electrified crochet allowed the procedure to be continued laparoscopically. The patient is then placed in Trendelenburg position and turned on the left side. The ileocecal valve is reached after adhesiolysis. The parietal peritoneum is incised at the level of Told's line and the caecum and terminal ileum are mobilized along the right parietocolic groove. The right colon is not mobilized. A stenosis was found in the last ileal loop and extended for about 10 cm in patient A, 12 cm in patient B and 8 cm in patient C, with distention of the proximal bowel loops.

Inflammation with reactive lymph nodes was found on the mesentery of the last ileal loop. Appendectomy was performed in patients A and C. A median, sub-umbilical / supra-pubic, mini laparotomic access is performed, with a vertical incision of approximately 7 cm. The loops are brought to the outside of the mini laparotomic access. Ileal resection is then performed with a PurseString Device (Purstring 45 mm - Covidien) 12 cm proximally to the ileocecal valve. Resection of the ileocecal valve with a curved suturing device (Contour - Ethicon) is carried out sparing the caecum almost completely (Fig. 1).

The head of the end-to-end circular Stapler 28 mm (Ethicon) is introduced into the ileal stump. A caecotomy is performed with a blade 11 scalpel through which the circular suturing machine is introduced to perform an end-to-end ceco-ileal anastomosis (Fig. 2). A closure of the caecal breach with the blue charged Echelon 45 linear stapler is then performed and the suture is sunk and reinforced with Vicryl 2/0 and synthetic biodegradable cyanoacrylate basis glue (Glubran 2). After closure of the mesentery and accurate hemostasis, a drainage is placed in the right parietocolic groove. Abdominal wall layer closure is then performed and skin is sutured with intradermal closure with 3/0 Prolene.

Discussion

Considering that more than 25% of patients with Crohn's disease need to undergo subsequent bowel resections within 5 years of their first surgery, saving as much intestine as possible is mandatory to avoid short bowel syndrome. The possibility of a laparoscopic or open approach was evaluated and from a review of the literature it emerged that, excluding the short-term advantages of laparoscopy, there is no evidence of difference between the two approaches in regard to relevant complications such as the formation of intra-abdominal abscesses, intestinal obstruction in the postoperative period, risk of wound infection, anastomotic leak and 30-day risk of reoperation³⁹. The choice of a mini-laparotomic approach, following a first video-assisted phase, allows, after cecotomy, to use a circular stapler to perform an anastomosis to restore the normal ileocecal continuity. Overall, a minimum of 11 to a maximum of 14 cm of terminal ileum and the ileocecal valve were removed in our experience. Histological examination of the removed segments confirmed the diagnosis of Crohn's disease and the disease-free margins of resection in all three cases.

At 6 and 12 months after surgery the patients did not report abdominal symptoms. Moreover, during the last colonoscopy in the intestinal lumen there was no evidence of the disease and the ileocecal anastomosis was patent and free from lesions, Rutgeerts' score⁴⁰ I₀₋₁ (Fig. 3).

Conclusion

Beside sparing as much bowel as possible to prevent short bowel syndrome, when evaluating a surgical strategy in the treatment of CD, the potential inflammatory response due to wound healing process must be considered. This element, is not precisely predictable with our current knowledge and may apparently structures that at the time of surgical exploration are disease free, since further acute and subacute inflammatory episodes can be triggered. Considering this, it is essential to accurately plan surgical strategies and techniques that minimize the extent of the resection and the anastomotic surfaces to the minimum, also considering that CD is a pancolic and sistemi disease and as such it can also involve macroscopically and microscopically free structures. Our approach shown good results with no evidence of disease progression and symptoms relapse over one year of follow-up. Over the months, patients will be followed by a multidisciplinary team (surgeons, gastroenterologists and endoscopists) to carefully evaluate the course of the disease over medium and long term. In conclusion, in young patients with Crohn's disease with a stricturing / penetrating phenotype limited to the ileocecal valve and terminal ileum and unresponsive to medical therapy, minimal ileal resection with removal of

the ileocecal valve and the sparing of a large part of the cecum and ascending colon may be a valid alternative to the standard ileo-colic resection. Furthermore, considering the overlapping of complications and results between the open and VL technique, introducing an hybrid mini laparotomic step should allow a more practical surgical resection without significantly increase procedural risks. Considering the disappearance of abdominal symptoms, the excellent aesthetic result of the surgical wound, of particular concern in young patients, and the findings during the follow up colonoscopy the presented approach could be proposed as a viable strategy in young patients with stricturing limited ileocecal Crohn's disease. Given the promising results, our aim is to treat a bigger cohort of patients treated with this strategy in order to better evaluate the validity and the long term outcomes of the technique we propose.

Riassunto

La malattia di Crohn (MC) è, insieme alla Rettocolite ulcerosa, una malattia infiammatoria cronica dell'intestino (MICI) ad eziopatogenesi multifattoriale. Si distinguono tre profili di malattia associati o meno alla localizzazione a livello perianale non stricturing/non penetrating, stricturing, penetrating. Il quadro clinico e l'evoluzione della patologia sono strettamente correlati al fenotipo.

Il trattamento medico, nella maggioranza dei casi, rappresenta il primo step nella gestione del paziente; esso si compone di un ampio ventaglio di scelta tra farmaci anti-infiammatori, cortisonici, immunomodulatori e terapia biologica; la scelta del tipo di farmaco da impiegare viene fatta in funzione del quadro clinico ed anatomicopatologico.

Il ricorso all'intervento chirurgico è invece indispensabile in presenza di complicanze responsabili di fenomeni occlusivi, perforativi o ascessuali e in caso di fallimento della terapia medica.

Tuttavia, in casi selezionati e documentati in letteratura, la terapia chirurgica rappresenta una scelta migliore come primo approccio terapeutico al paziente.

Giungono alla nostra attenzione tre pazienti tra i 20 e i 40 anni con diagnosi di Malattia di Crohn non responsiva a trattamento farmacologico. Alle indagini strumentali si individuano stenosi o fissurazioni in corrispondenza dell'ileo terminale e della valvola ileocecale. Le anse a monte delle stenosi appaiono dilatate; alla colonoscopia, la mucosa del cieco risulta indenne da malattia o solo lievemente infiammata.

L'intervento chirurgico standard per questo tipo di patologia consiste in una resezione ileocolica eseguita in laparoscopia. Dopo una attenta valutazione multispecialistica, accompagnata anche da una revisione della letteratura, si decide di sottoporre i pazienti ad una procedu-

ra mininvasiva videolaparoscopica consistente nella resezione dell'ileo terminale stenotico/fistolizzato, asportazione della valvola ileocecale e successivo confezionamento di anastomosi volta a ricreare la valvola rimossa.

La tipologia di intervento proposto ci ha consentito di ricreare la valvola effettuando un'anastomosi ileo-cecale e al tempo stesso di risparmiare quanto più intestino possibile considerando l'andamento cronico recidivante proprio della MC. Nel periodo post-operatorio non sono state riscontrate complicanze ed ai controlli endoscopici, a 6 e a 12 mesi dall'intervento, non sono presenti alterazioni della mucosa in corrispondenza dell'anastomosi ileocecale.

Riteniamo che, in specifiche condizioni cliniche ed endoscopiche, il trattamento da noi illustrato possa essere proposto ad altri pazienti in alternativa alla resezione ileocolica standard eseguita in VL.

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