REVIEW

LAPAROSCOPY IN THE DIAGNOSIS OF CROHN'S DISEASE AND LITERATURE REVIEW

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Abstract

Crohn's Disease is a dilemma from a surgical point of view. The nature of the pathology increases the technical complexity of surgical interventions, their morbidity and the incidence of reintervention. In this context, the advantages of minimally invasive surgery such as reduced hospitalization, fewer adhesions, the low incidence of wound complications, the faster return to normal intestinal function are of particular importance to these patients. This pathology that requires interventions in an elective context may in most cases be initially approached laparoscopically. Observatory sheets, operative protocols, and in some cases video recordings, were reviewed retrospectively over a period of 20 years (January 1997 - January 2017), bearing in mind indications, contraindications, difficulties and complications encountered. The literature on the minimal invasive approach to the treatment of Crohn's disease has also been reviewed by accessing medical databases (SCOPUS, PUBMED). The mean age of the study group was 40 years with female sex predominance. The main surgical indication was abdominal algic syndrome and intestinal transit disorders. For all patients, the diagnosis resulted from laparoscopy surgery - by macroscopic appearance of intestinal lesions and lymphatic tissue biopsy, with the clear majority of patients presenting mesenteric adenopathies during inflammatory attacks. The intestinal transit resumed on average on day 2 postoperatively and the duration of hospitalization was on average of 4 days. There were no intraoperative or postoperative incidents. Mortality was 0. Laparoscopic surgery combines many benefits for the patient with Crohn's disease, all of which eventually lead to a lower cost of care and a less hostile abdomen in the case of other interventions. These patients, through the anti-inflammatory treatment (steroids), fragile tissues, and abdominal adhesions complicate laparoscopic surgery - so it should only be attempted by experienced surgeons.

Keywords*: Crohn disease, laparoscopy treatment Crohn disease*

Introduction

Crohn's disease is an autoimmune pathology characterized by chronic inflammation that affects the entire thickness of the digestive tract wall from the oral cavity to the rectum, but predominantly affects the terminal ileum and proximal colon [1]. Diagnosis is confirmed early in the patient's life at 20 to 30 years [2].

Crohn's disease is a surgical dilemma. Despite advances made in recent years with the introduction of new therapies such as bio-molecules, the rate of patients requiring surgery has not changed, so 80% will need a surgeon in a lifetime while 20% will require surgery in the first year from diagnosis [3-5].

The patient with Crohn's disease is a difficult patient regardless of the surgical approach (open / laparoscopic) that is often undernourished and under chronic immunosuppressive therapy, all of which increase the risk of anastomotic fistula, sepsis or evisceration.

The inflammatory nature of the pathology, its characteristic of forming an adhesive syndrome, the increased morbidity of the patients, and the great possibility of reintervention all lead to a high technical complexity of surgical interventions, thus initially, laparoscopic interventions were avoided. Despite these challenges, as surgeon's experience grew, and the minimally invasive technique proved effective in oncological pathologies of the digestive tract (colorectal) - the results being comparable to those in the classic-open approach, the number of patients with Crohn's disease operated with the help of laparoscopy increased from year to year. This patient category is young, and has a net benefit following laparoscopic surgery. As has been shown, laparoscopy is associated with lower risks when compared to open surgery in terms of: suture line infections, postoperative lung complications, aesthetic appearance and size of scar. Also, the duration of hospitalization is shorter, the resumption of digestive tolerance and intestinal transit is faster (important aspect - the vast majority of these patients are undernourished), the intensity of adhesive syndrome is reduced, thus decreasing the risk of intestinal occlusion, an important aspect when tacking into account that 50% of these patients need reintervention in 10 years from the first operation [7-9].

Considering the above, in the case of patients with Crohn's disease the minimally invasive approach should only be tempted by surgeons experienced in laparoscopic surgery of the digestive tract but who also have knowledge in the treatment of inflammatory diseases of the digestive tract through laparotomy.

Materials and method

The observation sheets, the operative protocols and, in some cases, the video recordings were reviewed retrospectively over a period of 20 years (January 1997 - January 2017) noting the contraindications, difficulties and complications encountered. The literature regarding the laparoscopic treatment of Crohn disease using the medical data bases SCOPUS and PUBMED has been reviewed using the key words: Crohn disease, laparoscopy treatment Crohn disease.

Results

A number of 5 patients were identified in which laparoscopy was used as a diagnostic method.

Distribution by gender did not vary significantly: 3 women and 2 men. The average age was 28 years with extremes of 22 and 50 years.

Case no. 1:

Male -50-year old, smoker, without significant associated pathologies presented to the clinic for diffuse abdominal pain with accelerated intestinal transit. At admission the clinical examination identified a diffuse painful abdomen without signs of peritoneal irritation. Superior and inferior endoscopies were performed without identifying pathological changes. Clinical and paraclinical investigations were within normal limits including tumor markers. Surgical intervention was undertaken under general anesthesia by laparoscopic approach – intraoperatively distended ileal loops with erythema and paving stone aspect with mesenteric lymphadenopathy were identified. Biopsies from the mesentery were taken. The subsequent progression was favorable, the patient was diverted to the gastroenterology for further treatment.

Case no. 2:

A 22-year-old female patient with no significant anterior pathologies presented to the emergency room with known right fossa

syndrome and acute abdominal pain associated with fever. The clinical examination at admission identified a dilated abdomen, painful at palpation in the right iliac fossa raising the suspicion of acute appendicitis. Paraclinical investigations identified high inflammatory markers while abdominal ultrasound identified peritoneal fluid in a small quantity. The condition of the patient under symptomatic treatment did not improve.

Surgical intervention was undertaken with general anesthesia, through laparoscopic approach, intraoperatively terminal ileitis was identified with multiple mesenteric adenopathies and a small quantity of peritoneal fluid. Nodal biopsies and peritoneal lavage / drainage were performed. Postoperatively anti-inflammatory and hygienic-dietary regimens were initiated under which the condition of the patient improved (Figure 1).

Figure 1 - intraoperative laparoscopic aspect of multiple mesenteric lymphadenopathies

Case no. 3:

Patient GS, female of 36 years old presented to the emergency room with diffuse abdominal pain and persistent weight loss over the last 4 months of 10 kg and no other past medical history. Upon admission, the clinical examination identified an intense painful abdomen at palpation but without signs of peritoneal irritation. Paraclinical investigations identified an inflammatory syndrome with leukocytosis. The abdominal ultrasound identified thickening of the cecal wall and reduced intestinal peristalsis. Surgical intervention was done under general anesthesia by laparoscopic approach, intraoperatively the terminal ileal loop was inflamed with associated thickened mesentery and multiple adhenopathies which were biopsied. The postoperative progression was favorable, discharge was performed on postoperative day 3.

Case no. 4:

Patient SM, male -50-year old, smoker, without significant associated pathologies, presented in the clinic for diffuse abdominal pain with chronic but episodic evolution associated with diarrhea. At admission the clinical examination identified a diffuse painful abdomen without signs of peritoneal irritation. Superior and inferior endoscopies were performed without identifying pathological changes. Clinical and paraclinical investigations were within normal limits including tumor markers. Surgically intervention was undertaken with general anesthesia by laparoscopic approach – intraoperatively there were distended ileal loops with erythema and cobble stone aspect with mesenteric lymphadenopathy (Figure 2). Biopsies from the mesentery were taken. The subsequent progression was favorable, the patient was referred to the gastroenterology for further treatment.

Figure 2 - the cobblestone aspect of the terminal ileal loop

Case no. 5:

Patient SI aged 28 years old, known smoker presented to the emergency department for low-grade fever, anorexia, prolonged diarrhea with abdominal pain, weight loss, and generalized fatigability. Clinical investigation identified a diffuse abdominal tenderness and localized periumbilical pain. The laboratory studies identified leukocytosis, hypoalbuminemia and elevated inflammatory markers. The abdominal ultrasound was inconclusive. Under symptomatic treatment the

patient general status din not improve so the decision to operate was assumed under general anesthesia by minimal invasive approach. There were observed distended intestinal loops with peritoneal fluid and multiple, diffuse mesenteric adenopathies which were biopsied. (Figure 3). The postoperative evolution was favorable, and the patient was discharged on day 5.

Figure 3 – laparoscopy biopsy of the mesenteric lymphadenopathy

Histopathology

In the lymphadenopathies biopsied the histopathology report via hematoxylin-eosin stain identified a granuloma with central necrosis, surrounded by a lymphocyte crown and occasional infiltration of giant multinucleate Langerhans cells.

Discussions

Patients with Crohn's disease may require surgery for complications of the underlying pathology: fistula, abscess, intestinal obstruction or diagnosis as we have seen, in case of refractory symptoms to maximal drug therapy [10]. The cornerstone in these surgeries is the preservation of the length of gut, so preoperative preparation is essential to prevent a possible anastomosis fistula [11]. The microscopy aspect of abdominal lymphadenopathy requires a differential diagnosis with tuberculosis and sarcoidosis and requires interpretation in a clinical context.

Laparoscopic surgery offers a less invasive alternative from which patients with Crohn's disease, especially young patients, can benefit. These interventions reduce surgical stress by reducing the incidence of anastomosis fistula and wound-related complications such as suppuration or evisceration in a category of patients who are chronically immunosuppressed [12].

The severity of perivisceritis following surgery may also be reduced by reducing the handling of abdominal content and the absence of a median incision, an important aspect for a population that requires reintervention in a proportion of 50% in 10 years after the initial surgery, which is significantly younger with increased life expectancy [2,7].

The learning curve for laparoscopic surgery is steep. There are many studies in which laparoscopic interventions are compared to those in open surgery and have determined that at least 20-40 cases are required to refine the already existing set of skills to ensure the safety of laparoscopic interventions [13].

Milsomet al. performed the first randomized study on this subject [14]. He identified the morbidity values in laparoscopic interventions at 16%, while in open interventions he recorded 31%, statistically significant results ($p = 0.05$). The incidence of anastomosis fistula was similar (3% vs 0%) and the requirement for morphine analgesics. The duration of the intervention favored open approach to laparoscopy (85 minutes vs 140 minutes).

Short-term results for laparoscopic versus open-surgery in Crohn's disease were also evaluated by Umanskiy et al. who collected the data over a 6-year prospective period that confirmed the safety and effectiveness of the laparoscopic technique. Its short-term benefits include lower blood loss, faster recovery of intestinal transit, and smaller hospitalization duration. Similar results have been reported by Soop et al. and Kroesen et al. [15-17].

However, it should be remembered that through laparoscopy the tactile sense is lost, so portions of inflamed digestive tract with Crohn's disease may be omitted thus compromising the long-term results of the intervention. The immune response appears to be less intense in minimally invasive approaches thus lowering the relapse rate. Eshuis et al. prospectively randomized a group of 69 patients in two arms

open and laparoscopic. There was no difference between the two groups in the rate of reintervention for relapse or re-resection. The quality of postoperative life was similar, but differences were identified regarding the cosmetic impact and body image both of which favored laparoscopic interventions ($p < 0.001$) (18). Other prospective randomized studies identified a higher incidence (statistically significant $p = 0.006$) of reintervention during the follow-up period for open surgery, the main causes were perivisceritis and eventrations [19]. No differences were found in ano-rectal relapse and type of medication administered [19].

Laparoscopy for recurrent Crohn's disease is still a questionable field with interventions done only in carefully selected cases by experienced surgeons. Multiple publications compared laparoscopic resection vs. open resection in cases of reintervention, and the results of surgical success were similar [20]. Conversion rate was similar to baseline and incriminated factors were: intense perivisceritis, initially undiagnosed intestinal fistula identified intraoperatively, or the need for multiple intestinal resections. In the case of laparoscopic reinterventions for patients initially operated by open approach it was observed that the benefits of minimally invasive approach such as reduced recovery time or faster resumption of intestinal transit were lost with the exception of wound complications which was lower [21].

In cases of colonic lesions, laparoscopic surgery has proven useful in studies published by Moreira et al. Holubar et al. and Humanskyi et al. [15,22,23]. Longer operating times in laparoscopy were identified, but no statistically significant differences in intraoperative blood loss or short-term complications. Holubar et al. identified a higher incidence of postoperative complications (42%) in patients undergoing total colectomy - more frequent being anastomosis fistula. For ileocolonic anastomoses, a recent meta-analysis demonstrated a lower fistula rate than the median and lower local recurrence [24]. Globally, the risk of fistulae is between 3% and 20%, and an important factor is the administration of corticosteroids - the equivalent of 20 mg of prednisolone, whereas immunotherapy (Infliximab) does not appear to influence the rate of fistula and should not represent a contraindication for an anastomosis [25-27]. It is also noteworthy that Umanskiy observed the operating time was lower for laparoscopic interventions putting this difference on increased experience.

Cost-effectiveness: The cost of treating a patient with Crohn's disease is steadily rising and in Europe the estimates are around 2.1-16.7 billion euros / year. All these costs are expected to increase to the extent that new immunomodulatory therapies are introduced (28,29). Of these costs, hospitalization represents over 50%, thus the advantages of minimally invasive surgery (lower hospitalization time, faster recovery of intestinal transit, faster reintroduction in society) can positively impact these costs [30].

Conclusions

Crohn's disease remains a medical problem that affects the patient throughout his entire life. Patients frequently require immunosuppressive treatment and develop acute complications that require surgery. Literature is lacking large prospective, randomized studies but the consistently positive results from retrospective studies and the few small prospective studies indicate that laparoscopy provides excellent results in the short and long term at least similar to those of classical surgery, but it can also become one of the main ways of diagnosis. The microscopy aspect of the abdominal lymphadenopathy requires differential diagnosis. The minimally invasive approach can also be used successfully for reintervention in carefully selected cases, but laparoscopic reintervention after open surgery loses its advantages. Although operating times may be initially longer, through experience they are reduced, and the benefits of the minimally invasive approach are clearly superior to the open approach especially for these young patients. Laparoscopic surgery is a safe and feasible technique both in diagnosis and the treatment of Crohn disease.

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