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Right Hemicolectomy in Ileo-Caecal Crohn's Disease- A Review

Vinod Kumar Singhal*[1], Gaurav Diddi [2], Sudeep Dilip Roplekar [3], Adil M Suleman [4], Omer Elfaroug Amin Zaki [4], Nufra Senpher M Sarfaraz [5]

1. Department of Surgery, Prime Hospital, Dubai.

2. Department of Gastroenterology, Prime Hospital, Dubai.

3. Department of Radiology, Prime Hospital, Dubai.

4,5,6. Department of Surgery, Prime Hospital, Dubai.

Corresponding Author: Vinod Kumar Singhal, Department of Surgery, Prime Hospital, Dubai.

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Abstract

Although it can affect all parts of the digestive tract, Crohn's disease (CD), one of the main types of chronic inflammatory bowel illnesses, most frequently affects the small intestine, the terminal ileum, the colon, and the rectum. Tiredness, lower abdomen pain, fever, and diarrhea are common symptoms, and these are initially treated with conservative methods. Fistulas, abscesses, or strictures are among the complications that the majority of patients eventually experience. Surgery is frequently necessary in these situations. The literature regarding the course, complications, and surgical therapy of CD was reviewed. Searches were performed in PubMed, using the following key words: CD, surgery, immunosuppression, guidelines, malnutrition as well as appropriate sub-items. In most cases the literature is limited to detailed information on specific therapeutic or diagnostic topics. Right Hemicolectomy surgery has been shown to be a good alternative in terms of effectiveness, quality of life, and cost as the first-line therapy or as part of combination therapy with biologicals for some conditions, and should no longer be viewed as a last resort therapy for medically refractory or complex Crohn's disease, but reducing the waiting time to an acceptable period could not only prevent more complex disease but also help mitigate healthcare consumption and the patients during the waiting period.

Introduction

An inflammatory bowel illness with granulomatous symptoms that can affect both extraintestinal organs and the entire gastrointestinal tract is called Crohn's disease. Patients often have terminal ileal or colonic penetrating illness when they first present. The highest incidence and prevalence rates of Crohn's disease are seen in western nations, with a peak incidence in adolescence and early adulthood [1]. The incidence and prevalence rates have risen highest during the past few decades in newly industrialized nations [2,3,4]. This shows that industrialization and (western) lifestyle are related to the still unknown aetiology. Numerous various medicines have been investigated due to the fact that Crohn's disease is well known for its intermittent and relapsing course and the significant impact it has on patients' quality of life.

Surgery was traditionally used as a last resort if medical therapy had failed, but medical therapy is typically started as the first line of treatment. With surgical treatments becoming less invasive, it has become clear over the past few decades that earlier surgery can be used for some disease variations and in individuals with severe disease. It goes without saying that extensive small intestinal resections that cause short bowel syndrome and persistent stomata should be avoided. Approximately 3 out of 4 Crohn's patients today will have surgery at some point in their lives [5]. Patients who were diagnosed between the ages of 45 and 59, had perianal fistulas, or had small bowel illness appear to be at an elevated risk of surgery [5].

Crohn's disease location can be categorized into ileal (L1), colonic (L2), ileocolonic (L3), and isolated (L4) upper disease (which can also be added to the first three when concomitant), and behavior can be categorized into non-stricturing and non-penetrating (B1), stricturing (B2), and penetrating (B3) types with or without perianal disease [6, 7]. The two aspects of sickness that should be evaluated the most when choosing the best treatment options are location and behavior. Fistulas, for instance, frequently develop from abscesses brought on by the activity of perforating diseases, though abscesses can also develop from an already-existing fistula if the drainage is blocked.

Indications for Surgical Treatment

Crohn's disease (CD), ulcerative colitis, and disorders with overlapping pathologic characteristics, such as so-called indeterminate colitis, are all examples of chronic inflammatory bowel diseases (IBD). Diarrhea and stomach discomfort are common CD symptoms. Although CD can affect the entire gastrointestinal tract, it primarily affects the perianal area, colorectum, and terminal ileum. Immunosuppressive or immune-modulating medications are available for early treatment. The condition cannot be cured by either medical or surgical treatment. To lessen symptoms and improve the quality of life for patients, the goal of treatment is to induce and maintain remission of the condition. Surgery is required if medical treatment is unsuccessful. Multiple intestinal surgeries are frequently necessary for CD patients [8, 9]. However, deciding whether to stop medical treatment and start a surgical course of action can be challenging at times. A wide range of medications with successful symptom reduction and improved quality of life have been studied, particularly over the past ten years. Gastroenterologists occasionally inappropriately prolong medical care. Patients frequently detest the idea of having surgery, too. Due to the patient's compromised condition, this may postpone surgery, which could increase morbidity [9].

Even with more advanced conservative treatment options, the condition can progress and lead to problems such abscesses, fistulas, and stenosis. Surgery is strictly indicated in certain situations. Indications for surgical therapy also include the presence of dysplasia or malignancy as well as emergencies such excessive bleeding or perforation. CD frequently recurs and cannot be fully healed, in contrast to ulcerative colitis, which may be permanently cured through proctocolectomy. Some people will continue to have attacks after surgery as the condition progresses [10]. For the first year following surgery, the literature describes clinical recurrence rates in the range of 10-30%. In the 10 years following the operation, the risk rises to 60% [10]. To select the optimal therapy at this time, a clear risk management is required. At times, the dangers of long-term medicine must be compared to those of surgery. The primary goal of surgical methods in CD is to limit resection to symptomatic bowel regions solely in order to prevent small bowel syndrome.

Upper GI Crohn's Disease

The oesophagus, stomach, duodenum, and jejunum are all affected by Crohn's disease in the upper gastrointestinal tract, and symptoms include strictures, erosions/ulcerations, fistulas, and a bamboo joint-like look in the stomach [9]. There is currently a lack of information on the management of upper gastrointestinal Crohn's disease, despite the fact that knowledge of the condition has grown and involvement of the upper gastrointestinal tract is a known predictor of problems and recurrence [10]. There has been a noticeable rise in upper gastrointestinal tract lesions over the past few decades, with reports varying widely between 17 and 75% and being unrelated to the severity of symptoms [11].

According to estimates [10,11], the incidence of oesophageal Crohn's disease ranges from 0.3 to 1.8% in adults and up to 6.5% in pediatric patients. Although endoscopy of the upper gastrointestinal tract is rarely performed on Crohn's patients who are asymptomatic, it is likely that the true incidence rates are significantly higher [12, 13]. The most typical locations for Crohn's lesions, such as ulcers, erosions, and strictures, are the mid and distal oesophagus [14]. Surgery is rarely necessary for these lesions because endoscopic dilatation frequently suffices to loosen the strictures, but segmental resection may occasionally be necessary. Oesophageal Crohn's disease frequently coexists with extraintestinal symptoms such pyoderma gangrenosum, spondylarthropathy, and uveitis.

A small percentage of people with Crohn's disease—between 0.5 and 4%—have gastroduodenal Crohn's disease [12]. There is currently no agreement on how to treat Crohn's disease in the upper gastrointestinal tract. Medically unresponsive individuals should think about having surgery since dysplasia and cancer can develop in the duodenum and other persistent upper gastrointestinal

strictures. Surgery is typically performed on patients who are resistant to first-line medical therapy or who have problems (such as restriction, fistula, and abscess). Other known indications for surgery include significant or prolonged bleeding, gastric outlet obstruction, or duodenal obstruction. Short strictures, where "short" is defined as less than 10 cm, are the most common indications for the use of stricturoplasties. An antrectomy with Roux-en-Y bypass is typically used to treat gastric strictures in the antrum and pylorus [14]; however, laparoscopic bypass surgery with gastrojejunostomy is also frequently employed.

Ileal and ileocaecal Crohn's disease through Right Hemicolectomy

The importance of surgery in complex ileocaecal disease involving, for example, abscesses, blockage, or sepsis is acknowledged in consensus guidelines. The development of a staging tool for ileocolonic Crohn's disease may improve surgical decision-making [14]. The surgical classification separates (4) perforating disease evident by intra-abdominal abscess or collection from (3) penetrating disease evident by fistulating disease (including enterovesicle/entero-vaginal/entero-cutaneous/multiple fistulae) and (1) predominantly inflammatory ileal stricture from (2) predominantly fibrotic ileal stricture [15]. The staging technique can inform patients of the likelihood of things like concurrent surgery or the creation of stomata, for example, and is being verified using magnetic resonance enterography and computer tomographic enterography [15].

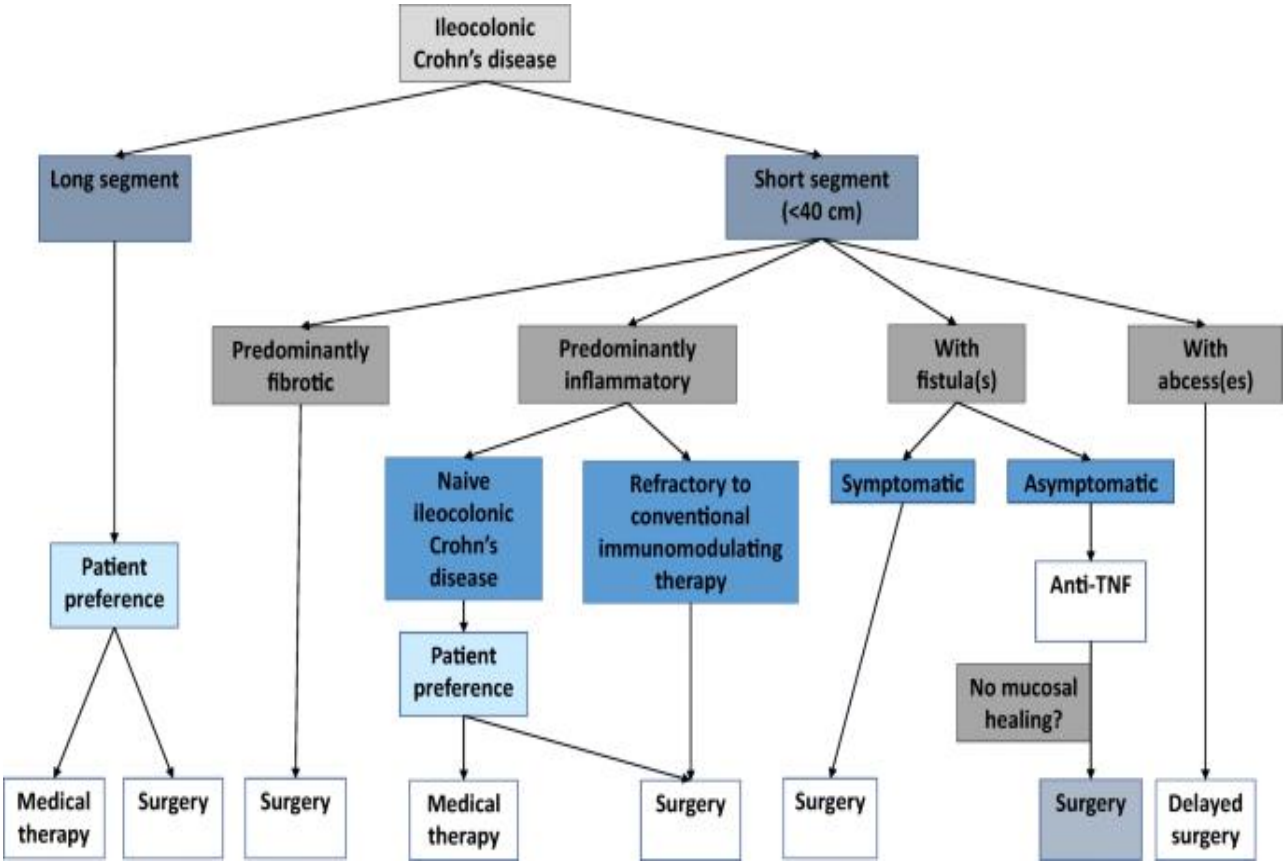

Figure 1- Treatment Strategy in Crohns Disease (Ileoileal/Ileocolonic/Ileocaecal)

Preparation [12,13,14,15]

Work Up- There are various steps in the routine workup for elective hemicolectomy. All patients should have their surgical readiness examined at first. Investigations for this include an electrocardiogram (ECG), a full blood count, urea and electrolytes, group and save, and other tests as needed. Spirometry, transthoracic echocardiography (TTE), and cardiopulmonary exercise testing are a few additional examinations that should be evaluated if they are needed to determine cardiovascular and respiratory fitness (CPET). [12]

Bowel Prep- Bowel preparation is given pre-operatively and reduces the impact of an early anastomotic leak in the absence of obstructive lesions. Most frequently, a solution of sodium picosulphate and magnesium citrate is used to prepare the bowel. This medication inhibits sodium/water reabsorption in the distal small bowel while promoting colonic contraction. In the literature, a few other bowel preparation techniques are covered. [13]

Prophylactic Antibiotics- Commonly, cefuroxime and metronidazole are given just before the start of anesthetic induction. In the case of Bacteroides fragilis, metronidazole offers protection. A broad-spectrum antibiotic that works against gut anaerobes is cephalosporin. The use of antibiotics to lower sepsis rates in colorectal resections is supported by high-level randomized control trial evidence. If there has been significant intraoperative soiling, prolonged antibiotic therapy is recommended. [14]

Bladder Catheterization- Bladder catheterization, which is carried out after anesthesia induction, enables meticulous postoperative fluid balance monitoring. [15]

Ileocaecal Resection in CD by Right Hemicolectomy-

The terminal ileum is the primary target of CD in the small intestine. Recurrent inflammation frequently results in scarred stenosis. Endoscopic dilatation is an effective treatment for short stenoses. Inflammatory stenoses are often managed conservatively. Patients with refractory blockage (failed medicinal or endoscopic treatment) should consider surgery [16]. The preferred surgical procedure is ileocecal resection (Figure 2). It is extensively debated how to restore bowel continuity. Early postoperative results are equivalent with regard to anastomotic leakage or surgical site infections, and end-to-end and side-to-side anastomosis are distinct [16]. After ileocecal resection, there is a chance that inflammation will return. 20% of participants eventually get symptomatic stenoses. Up to 45% of the patients indicated above require further surgery [17].

For patients with CD, a laparoscopic procedure is preferred for ileocecal excision. In our department, where appropriate, minimally invasive surgery is the preferred option. Less postoperative discomfort, less postoperative ileus, a shorter hospital stay, and improved postoperative recovery are all benefits of laparoscopic surgery. In individuals with conglomerate tumors or complex interenteric fistula systems, a second incision may be required for bowel removal. When inflammation is evident inside the resection margins, the creation of a stoma can be an extra safety precaution. In light of the fact that many of these patients are receiving immunosuppressive therapy, ostomy can offer a secure surgical method for the postoperative period. [18,19]

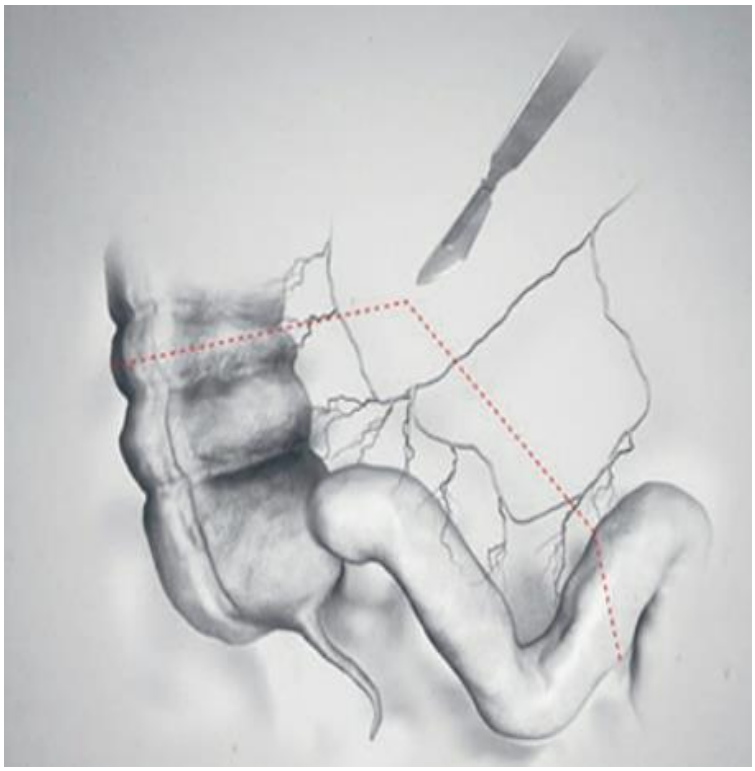

Figure 2- Ilea-Caecal Resection in CD

More than 60% of CD patients experience colonic involvement. 20% of these patients develop an isolated Crohn's colitis, and perineal or rectal attacks affect 50% of them [20,21]. Depending on the degree of colonic involvement, various surgical procedures must be addressed. For patients with prolonged colitis or Crohn's disease, various surgical techniques are available. A right hemicolectomy should be done in an emergency (bleeding, perforation) [22]. A rectal stump and an end ileostomy are used in this situation. After a period of recovery, bowel continuity can be restored. Ileocaecal anastomosis can be performed on patients with minimal or no rectal CD involvement. (Figure 3)

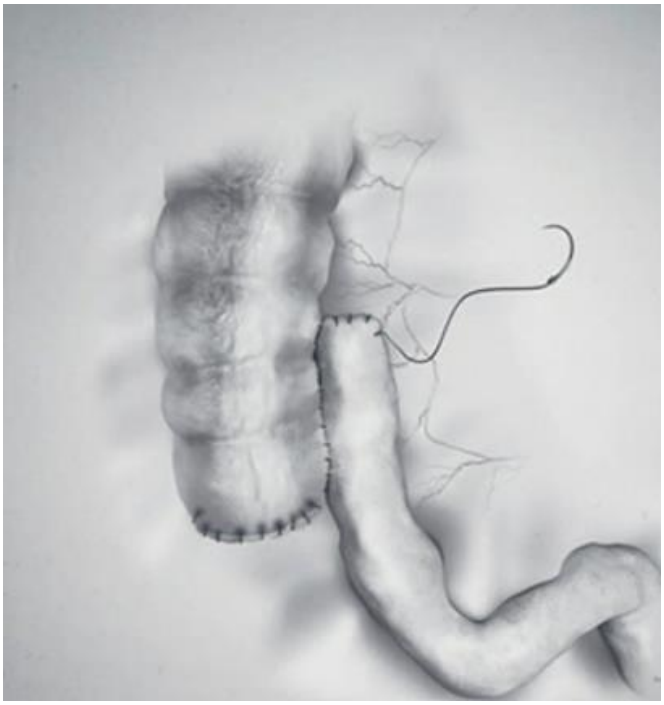

Figure 3- Side to Side Anastomosis with Right Hemicolectomy

Discussion

The current research demonstrates how difficult it is to surgically control Crohn's disease's numerous manifestations. The location and severity of each patient's condition, as well as other specific disease characteristics, should guide surgical care. Surgery timing and indication must be discussed by a multidisciplinary team that includes at least gastroenterologists and surgeons. Regarding the sort of surgery and the time of the procedure, there are still several unanswered concerns. There are still some unresolved surgical issues, such as how to handle the mesentery during proctectomy and ileocolonic resection, however current research appears to support mesenterectomy in the latter. Additionally, there is debate over whether a non-restorative proctectomy should be carried out via close rectal dissection, leaving the mesorectum in place, or using TME as described above. This depends on the ongoing debate over the mesentery's role in Crohn's disease, for which there is now conflicting evidence. Further study is needed on a number of surgical conundrums, such as the significance of (non-conventional) stricturoplasties and the relevance of the Kono-S anastomosis as a prophylactic therapy for recurrent Crohn's disease. [23,24]

Surgery plays a bigger and bigger part in Crohn's disease treatment. The LIRC and PISA trials [23, 24] both illustrate the rising significance of surgery. Only patients with uncomplicated, non-stricturing ileocaecal Crohn's disease who had not responded to conventional therapy were randomly assigned to

have laparoscopic ileocaecal resection or infliximab in the LIRC trial. Patients who had severe diseases or clinically substantial strictures were turned away since they unquestionably needed surgery. According to the study, laparoscopic ileocaecal resection is a more cost-effective treatment option for Crohn's terminal ileitis and can provide the gastroenterologist a new lease on life [25, 26].

This brings to light a crucial problem with treating Crohn's patients: the purpose of treatment. Since Crohn's is a benign illness, clinical, radiological, or endoscopic healing or quality of life should be prioritized over survival. Since real fistula closure is still up for debate, this is crucial for patients with perianal fistulas in particular. Since a closed external fistula opening is connected with fewer symptoms and an improved quality of life, clinical healing is frequently seen as being of utmost importance. The fistula reopens or the patient develops recurrent abscesses when the patient falls below the trough level due to the fact that patients frequently require chronic medical therapy.[27]

Gastroenterologists frequently anticipate that medicinal therapy, particularly biologicals, may reduce the need for surgery, but in some patients, this is only true temporarily. After a few years, a large number of patients who initially respond well to medical therapy need surgery, and these rates only rise in medically refractory individuals. The timing of surgery is crucial because delaying it may cause these patients' chronic conditions to worsen, endangering their socioeconomic well-being, and cause them to consume more expensive medical treatments than necessary—with no apparent benefit. Delayed surgery is not always beneficial and is linked to more complicated diseases and larger bowel resections, particularly in patients who underwent numerous cycles of biological therapy over an extended period of time, with greater problems and stomata. [28]

The waiting period for surgery becomes an issue once it has been determined that surgery is the best course of action. There is currently a longer waiting period for both active and inactive (such as pouch surgery after subtotal colectomy) Crohn's disease surgeries because oncological surgery is prioritized above benign surgery [29]. According to a recent cohort research, 13% of inflammatory bowel disease patients who were waiting for surgery had to have acute- or semi-acute surgery, while 15% of patients with inactive disease and 19% of active illness patients experienced difficulties while waiting [30]. In addition, 44% required further care, which included more clinic visits for outpatient care, trips to the ER, or inpatient admission [30].

Conclusion

There are numerous reasons for surgery in people with CD. There are numerous complex methods accessible. Given that CD cannot be treated, strict criteria must be met before performing surgery, and it should be as limited and intrusive as feasible. For first-line conservative treatment, induction therapy, and remission maintenance, close collaboration between surgeons and gastroenterologists is crucial. Right Hemicolectomy surgery has been shown to be a good alternative in terms of effectiveness, quality of life, and cost as the first-line therapy or as part of combination therapy with biologicals for some conditions, and should no longer be viewed as a last resort therapy for medically refractory or complex Crohn's disease, but reducing the waiting time to an acceptable period could not only prevent more complex disease but also help mitigate healthcare consumption and the patients during the waiting period.

Reference

1. Prideaux L, Kamm MA, De Cruz PP, Chan FK, Ng SC.Inflammatory bowel disease in Asia: a systematic review. J Gastroenterol Hepatol,2017; 27(8):1266–1280

2. Ng SC, Shi HY, Hamidi N, Underwood FE, Tang W, Benchimol EI, Panaccione R, Ghosh S, Wu JCY, Chan FKL, Sung JJY, Kaplan GG.Worldwide incidence and prevalence of inflammatory bowel disease in the 21st century: a systematic review of population-based studies.2017; Lancet 390(10114):2769–2778.

3. Su HY, Gupta V, Day AS, Gearry RB. Rising incidence of inflammatory bowel disease in Canterbury, New Zealand. Inflamm Bowel Dis.2019; 220 (9):2238–2244.

4. Bernell O, Lapidus A, Hellers G. Risk factors for surgery and postoperative recurrence in Crohn’s disease. Ann Surg;2015; 231(1):38–45.

5. Satsangi J, Silverberg MS, Vermeire S, Colombel JF. The Montreal classification of inflammatory bowel disease: controversies, consensus, and implications. Gut 2017;55(6):749–753.

6. Romberg-Camps MJL, Dagnelie PC, Kester ADM, et al: Influence of phenotype at diagnosis and of other potential prognostic factors on the course of inflammatory bowel disease. Am J Gastroenterol 2019;104:371-383.

7. Singleton JW, Law DH, Kelley ML, et al: National Cooperative Crohn's Disease Study: adverse reactions to study drugs. Gastroenterology 2009;77:870-882.

8. Bemelman WA, Allez M: The surgical intervention: earlier or never? Best Pract Res Clin Gastroenterol 2014;28:497-503.

9. Yamamoto T, Allan RN, Keighley MR: Risk factors for intra-abdominal sepsis after surgery in Crohn's disease. Dis Colon Rectum 2000;43:1141-1145.\

10. Campbell L, Ambe R, Weaver J, et al: Comparison of conventional and nonconventional strictureplasties in Crohn's disease: a systematic review and meta-analysis. Dis Colon Rectum 2012;55:714-726.

11. Solberg IC, Vatn MH, Høie O, et al: Clinical course in Crohn's disease: results of a Norwegian population-based ten-year follow-up study. Clin Gastroenterol Hepatol 2007;5:1430-1438.

12. Longo WE, Johnson FE. The preoperative assessment and postoperative surveillance of patients with colon and rectal cancer. Surg Clin North Am. 2002 Oct;82(5):1091-108.

13. Kolovrat M, Busić Z, Lovrić Z, Amić F, Cavka V, Boras Z, Servis D, Lemac D, Busić N. Mechanical bowel preparation in colorectal surgery. Coll Antropol. 2012 Dec;36(4):1343-46.

14. Ishibashi K, Ishida H, Kuwabara K, Ohsawa T, Okada N, Yokoyama M, Kumamoto K. Short-term intravenous antimicrobial prophylaxis for elective rectal cancer surgery: results of a prospective randomized non-inferiority trial. Surg Today. 2014 Apr;44(4):716-2.

15. Rega D, Pace U, Scala D, Chiodini P, Granata V, Fares Bucci A, Pecori B, Delrio P. Treatment of splenic flexure colon cancer: a comparison of three different surgical procedures: Experience of a high volume cancer center. Sci Rep. 2019 Jul 29;9(1):10953

16. Hedrick TL, Friel CM: Colonic Crohn disease. Clin Colon Rectal Surg 2013;26:84-89.

17. Hyman NH, Cataldo P, Osler T: Urgent subtotal colectomy for severe inflammatory bowel disease. Dis Colon Rectum 2015;48:70-73.

18. Amiot A, Gornet J-M, Baudry C, et al: Crohn's disease recurrence after total proctocolectomy with definitive ileostomy. Dig Liver Dis 2011;43:698-702.

19. Hull TL, Fazio VW: Surgical approaches to low anovaginal fistula in Crohn's disease. Am J Surg 2017;173:95-98.

20. Sher ME, Bauer JJ, Gelernt I: Surgical repair of rectovaginal fistulas in patients with Crohn's disease: transvaginal approach. Dis Colon Rectum 2011;34:641-648.

21. O'Riordan JM, Datta I, Johnston C, Baxter NN: A systematic review of the anal fistula plug for patients with Crohn's and non-Crohn's related fistula-in-ano. Dis Colon Rectum 2012;55:351-358.

22. Joo JS, Weiss EG, Nogueras JJ, Wexner SD: Endorectal advancement flap in perianal Crohn's disease. Am Surg 2008;64:147-150.

23. Gardenbroek TJ, Verlaan T, Tanis PJ, Ponsioen CY, D'Haens GR, Buskens CJ et al. Single-port versus multiport laparoscopic ileocecal resection for Crohn's disease. Journal of Crohn's & colitis;2008; 7(10):e443–e448.

24. Resegotti A, Astegiano M, Farina EC, Ciccone G, Avagnina G, Giustetto A et al. Side-to-side stapled anastomosis strongly reduces anastomotic leak rates in Crohn's disease surgery. Dis Colon Rectum. 2018; 48(3):464–468.

25. Yoon YS, Yu CS, Yang SK, Yoon SN, Lim SB, Kim JC. Intra-abdominal fistulas in surgically treated Crohn's disease patients. World J Surg;2014; 34(8):1924–1929.

26. Thompson JS, DiBaise JK, Iyer KR, Yeats M, Sudan DL. Postoperative short bowel syndrome. J Am Coll Surg. 2016; 201(1):85–89.

27. Andersson P, Olaison G, Hallböök O, Sjödahl R. Segmental resection or subtotal colectomy in Crohn's colitis? Dis Colon Rectum; 2016; 45(1):47–53

28. Eglinton TW, Barclay ML, Gearry RB, Frizelle FA. The spectrum of perianal Crohn's disease in a population-based cohort. Dis Colon Rectum; 2014; 55(7):773–777.

29. Kiran RP, Khoury W, Church JM, Lavery IC, Fazio VW, Remzi FH et al. Colorectal cancer complicating inflammatory bowel disease: similarities and differences between Crohn's and ulcerative colitis based on three decades of experience. Ann Surg;2016; 252(2):330–335.

30. Wasmann KA. Complications while waiting for IBD surgery-short report. J Crohn's & colitis; 2020; 14(2):277–280.