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Indications and Outcome of Surgical Treatment of Crohn's Disease in Gastroenterology and Hepatology Hospital

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ABSTRACT

Crohn's disease of both varieties (abdominal and perineal) may lead to many surgical complications treated by different procedures. The role of surgery has a paramount importance in treating Crohn's disease complications despite medical therapy. The purpose of this study is to investigate the indications, types, and outcomes of surgical therapy for Crohn's disease at gastroenterology and hepatology hospitals. This is a longitudinal sectional prospective study that was conducted in Gastroenterology and Hepatology Hospital from March 2020- May 2022, involves 35 patients of Crohn's disease were diagnosed relying on clinical, radiological, and histopathological result based on endoscopic biopsy and/or surgical specimen. Current study demonstrated that the most common indication of surgery in abdominal Crohn's disease cohort is intestinal obstruction with 23 patients (65.71%) treated by ileocecal resection. Intestinal fistula 7 patients (20%). Failure of medical treatment 3 patients (8.57%). Malignancy 2 patients (5.71%). Psoas abscess drainage 1 patient (2.85%). Most common Indication of surgery in peri-anal Crohn's disease is intractable perianal fistula to medical treatment 5 patients (14.28%), Perianal abscess patients (8.57%). Although the medical treatment is the corner stone in management of Crohn's disease but early referral to digestive surgeon is preferable to decrease the suffering of the patients and improve the outcome.

INTRODUCTION

Crohn's Disease (CD) is a chronic inflammatory intestinal disease, first described as regional ileitis by Crohn, Ginzburg and Oppenheimer in a case series presented at American Medical Association annual meeting in 1932 (Baumgart *et al.*, 2007). Crohn's disease is defined a chronic inflammatory bowel disorder characterized by a transmural inflammatory reaction and non-caseating small granulomas and may involves all parts of the gastrointestinal (GI) tract from the mouth to the anus (Stangl *et al.*, 2002; Vanek *et al.*, 1988; Haddad *et al.*, 1993; Prieto-Nieto *et al.*, 2002), Several subtypes are recognized, depending on the area of the GI tract most affected (Crohn *et al.*, 2000; Abraham *et al.*, 2066). Crohn's disease is grouped with other inflammatory bowel diseases (IBDs) such as ulcerative colitis (Nasseri-Moghaddam *et al.*, 2012) is distinguishing features include discontinuous, transmural inflammation involving the whole thickness of the bowel wall, and an inflammatory response associated with lymphoid aggregates and granulomas (Rodriguez *et al.*, 2020).

A cure remains elusive, and efficient management of Crohn's disease is essentially multidisciplinary and interprofessional (Mazal *et al.*, 2014).

Treatment of Crohn's disease is multidisciplinary: medical treatment is focused on mucosal healing and reduction of symptom; surgery maintains a key-role in treating complications such as stenosis, perforations, fistulas and abscesses (Bednarz *et al.*, 2008; Frolkis *et al.*, 2013).

The main treatment is medical, while surgery is indicted only for complications of the disease and treatment (Shaffer & Wexner, 2013).

Absolute indications for surgery in Crohn's disease include cancer, or suspicious, perforation, toxic megacolon and major life threatening gastrointestinal tract (GIT) bleeding. Relative indications include strictures, phlegmon, fistulae, intra-abdominal abscesses, GIT bleeding, dysplasia-associated lesion or mass (DALM), high grade dysplasia detected on surveillance, growth retardation in children and failure of medical therapy.

Patients with Crohn's disease often may have multiple intestinal surgery (Van Koperen *et al.*, 2009; Michelassi *et al.*, 1993).

The aim of current study is to study the indications, types and outcomes of surgical therapy in the treatment of Crohn's disease in gastroenterology and hepatology hospital.

MATERIALS AND METHODS

This study was done in gastro enterology and hepatology center from March 2020- May 2022 of prospective of 35 patients case series,These patients of Crohn's disease diagnosed depending on clinical, and radiological and histopathological finding on the basis of endoscopic biopsy or surgical specimen or both. Also patients send for routine investigations including hematological , biochemical, and radiological which include (U/S, CT scan of abdomen with i.v and oral contrast).

Pelvic MRI study indicated if Crohn's disease involving peri-anal region especially perianal fistula.

Patients admitted to surgical ward then categorized

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into either emergency condition (subacute intestinal obstruction) or elective one, prepared and assessed in following preoperative measure:

1- Routine investigations as mentioned above.

2- Nutritional assessment including body mass index, s.albumin, if body mass index less than 18.5 or s.albumin less than 3.5 mg/dl then enteral or total parenteral nutrition started, correction of electrolyte and blood transfusion for anemia.

3- Antibiotics indicated if there was focus of infection.

4- Prophylactic dose of low molecular heparin was given.

5- Cessation of smoking.

6- Discussion with gastroenterologist about withdrawal of biological therapy and steroid.

7- Two patients with intra-abdominal abscess diagnosed by U/S and CT scan submitted for drainage under radiological guidance.

Inclusion criteria, all patient of Crohn's disease underwent surgery in gastrointestinal tract during period of disease.

Statistical Analysis: The stats of this project were performed using Microsoft excel. This study relied on the total number of patients.

RESULTS AND DISCUSSIN

This study included 35 patients, 23 male (65.71%), female 12 (34.28%), male to female ratio was 1.9:1, results in table-1 showed the most common age between 20-29 year and the least between 10-19 years. 18 patients were smoker (51.42%).

Table 1: Patients demographic data

Demographic data	Number of patients	%
Gender		
Male	23	65.71
Female	12	34.28
Duration of disease		
< 1 year	2	5.7
1-5 year	24	68.5
5-10 year	3	8.5
10-20 year	6	17.14
Mode of treatment		
Immunomodulation treatment	9	25.71
Biological treatment	7	20
Both	19	54.28
Smoking		
-ve	17	48.57
+ve	18	51.42
Frequency of surgery		
Two surgery	23	65.71
Single surgery	12	34.28
Age(years)		
10-19	2	5.71
20-29	17	48.57
30-39	8	22.85
40-50	8	22.85
Crohn's disease predominancy		
Abdominal Crohn's disease	28	80
a-Obstructing	23	65.71
b-Penetrating	5	14.28
Perineal Crohn's disease	3	8.57
Both	5	14.28

Mode of treatment including both biological and immunomodulation were 19 patients (54.28%), immunomodulation alone 9 patients (25.71%), while biological alone were 7 patients (20%).Patients underwent two surgical operations in their period of disease were 23 patients (65.71%), while those underwent only one surgery were 12 patients (34.28%).

Abdominal Crohn's disease predominates in 28 patients (80%), while perineal involvement were 3 patients (8.57%), while both were 5 patients (14.28%).

Results in table-2 showed the most common indication of surgery in abdominal Crohn's disease cohort was intestinal obstruction 23 patients (65.71%), While fistula 8 patients (22.85%), malignancy was an indication of surgery in 2 patients (5.71%). 2 patients were colonic carcinoma, and 1 patient was gastric carcinoma.

Table 2: Indications of surgery in abdominal Crohn's Disease

Indications	Number of Patients	Percentage
Intestinal obstruction	23	65.71
a. Ileocecal cause	18	51.42
b. Small bowel cause	5	14.28
Failure to medical treatment such as:	3	8.57
a-Bleeding per rectum	1	2.85
b-Sever perianal fistulation disease	2	5.71
Intestinal fistula:	7	20
a-Entero-cutaneous (penetrating)	5	14.28
b-Entero-vesical fistula	2	5.71
Malignancy	2	5.71
Psoas abscess	1	2.85

Table -3 regarding perineal Crohn's disease fistula in ano predominate the indication of surgery in 5 patients (14.28%), while the other were perianal abscess 3 patients (8.57%).

Table 3: Indication of surgery in peri-anal Crohn's disease

Type of indication	Number of Patients	Percentage
Intractable perianal fistula to medical treatment:	5	14.28
a-High type	3	8.57
b- Low type	2	5.71
Perianal abscess	3	8.57

Results in table-4 showed the most common surgical procedure done in abdominal Crohn's disease cohort was ileocecal resection 23 patients (65.71%) of obstructing group including ileocecal resection, stricturoplasty and small bowel resection. The least ones were ileostomy, colostomy, liver resection, and total proctocolectomy with permanent ileostomy 1 case for each (2.85%).The liver resection was performed because of metastatic colonic tumor, While surgery was done for penetrating (fistulating) manifested as enterocutaneous fistula group includes ileocecal resection.

Table 4: Types of Surgery (abdominal and perianal Crohn's disease)

Types of Surgery	Number of Patients	Percentage
Ileocaecal resection	23	65.71
a. Subacute intestinal obstruction	18	51.42
b. Intractable enterocutaneous fistula (post-appendecectomy)	5	14.28
Stricturoplasty (small bowel)	3	8.57
Small bowel resection	2	5.71
Right hemicolectomy	1	2.85
Fecal diversion (ileostomy)	2	5.71
Liver resection	1	2.85
Total proctocolectomy and permanent ileostomy	1	2.85
Drainage of abscess	4	11.42
1. Perianal abscess	3	8.57
2. Psoas abscess	1	2.85
Partial cystectomy (Enterovesical Fistula)		

Results in table 5: showing morbidity in form of anastomotic dehiscence and intestinal obstruction of adhesive type were 2 patients for each (5.71%). Wound infection was occurred in 10 patients (28.55%), Other morbidity in form of pulmonary complications was zero as well as mortality rate.

Table 5: Morbidity and Mortality

Complications	Numberof Patients	Percentage
Anastomosis dehesaience	2	5.71
Intestinal obstruction (Adhesive type)	2	5.71
Wound infection	10	28.55
Mortality	Zero	0

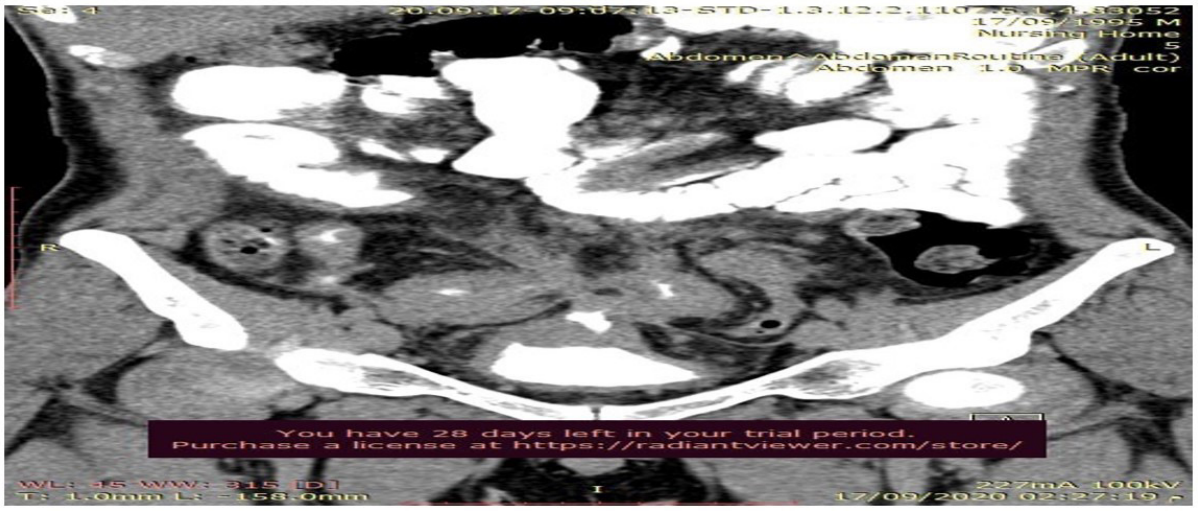

Figure 1: CT scan with oral contrast of patient with Crohn's disease showing ileovesical fistula (contrast material filling the urinary bladder)

Figure 2: Specimen of ileocecal resection of a patient with Crohn's disease showing fat wrapping and mass in ileocecal region

About 70% to 90% of people with Crohn's disease (CD) will ultimately need surgery (Shaffer *et al.*, 2013). Once the need for surgical intervention has been established in CD, the surgical strategy will vary depending on the intestinal segment affected (Beck *et al.*, 2014). Depending on patient's general condition,severity of disease, and the involvement of intestinal segments, surgical treatment of CD may include ileocecal resection, subtotal colectomy with ileorectal anastomosis, total proctocolectomy, segmental small bowel resection, and stricturoplasty (Beck *et al.*, 2014). Stoma may be added to these procedures when necessary. ileocecal resection the most surgical proceger (Mühe *et al.*, 1981). Surgical recurrens is highly in C.D , so multiple operations may be needed (McNamara *et al.*, 1990; Van Koperen *et al.*, 2009).

1) Michelassietal (1993) and Farmer *et al.* (1975), in this study, we found that (65.71%) of patients had more than one operation. The terminal ileum is the most common Crohn's affected site requiring surgery (Michelassi *et al.*, 1993; Farmer *et al.*, 1975).

In this study, the incidence of involvement of terminal ileum was (65.71%), bowel obstruction from stricture is the most common reason for surgery in CD (Kühn *et al.*, 2005). Stricturing phenotype of CD is most common in ileal disease and in patients diagnosed with CD at a younger age. In this study, 23 patients (65.71%) had an incidence of obstruction, including 5 patients (14.28%) with subacute intestinal obstruction post-appendicectomy. The most common surgery for stricturing disease in CD is ileocolic resection for ileocaecal or distal ileal disease (Kühn *et al.*, 2005). This study showed the incidence of ileocecal resection is (80%). An ileocolic resections high proportion for Crohn's disease is performed in the emergency setting (Kühn *et al.*, 2005).

In current study, the incidence of acute appendicitis is (37.74%). The treatment of choice for appendiceal CD is appendectomy. Acute appendicitis diagnosis in CD is frequent, but the atypical symptom (Vanek *et al.*, 1988). In 1% –30% of cases, free perforation is the earliest indication of CD (Greenstein *et al.*, 1987). In this study, the free perforation was 2.82% in form of perforated appendicitis.

Failure of medical treatment defined as failure of complete clinical response with 8-12 wk. of oral steroids and other agents. Approximately 20%-30% of CD patients do not respond to steroids, and up to 45% of CD patients will relapse on weaning of steroids (Munkholm *et al.*, 1994) as well as failure of medical treatment manifested as bleeding per rectum (2.85%) treated by total proctocolectomy and permeant ileostomy, another indication of surgery failure of medical treatment was severe perianal fistulating, two patients (5.71%), one patient treated by diversion ileostomy and second one treated by fistulotomy.

In general, intestinal fistulae are the primary indication to surgical treatment if they connect with the genitourinary tract, if their drainage is cause for personal embarrassment and discomfort, or if they create a bypass of such magnitude as to cause intestinal malabsorption.

Majority of intra-abdominal fistulae undergo intestinal resection and primary anastomosis (Broe *et al.*, 1982), also colocutaneous and enterocutaneous fistulae usually require surgical intervention (Zhang *et al.*, 2014).

Intestinal fistula that was (20%) divided into enterocutaneous (14.28%) treated by ileocecal resection, those patients who developed this complication post-appendicectomy and entero-vesical fistula (5.71%) which was manifested by recurrent urinary tract infection treated by segmental resection of diseased bowel and partial cystectomy.

A common large bowel fistula is the ileosigmoid fistula which is a well-known manifestation of CD. These patients require ileocolic resection and either primary repair or segmental resection of the sigmoid, or a subtotal colectomy (Van Koperen *et al.*, 2009).

The risk of cancer ranges from 1%-5% in CD, representing a 2-3 times increased risk of developing colorectal cancer and > 18 times increased risk of developing small bowel cancer (Van Koperen *et al.*, 2009).

The transmural inflammation of Crohn's disease increases the risk for bowel perforation and formation of fistula that can lead to psoas abscess formation. Although psoas abscess is most commonly present in longstanding Crohn's disease, it can also be its first manifestation (Rastogi *et al.*, 2018; Atkinson *et al.*, 2006). In this study, the incidence of psoas abscess is (2.85%), it was the first symptom of Crohn's disease treated by drainage under ultrasound guidance with antibiotics.

Perianal pathology can be occured in 40%-80% of patients with CD. Colonic and rectal CD phenotypes are associated with increased risk of perianal disease (Atkinson *et al.*, 2006; Toh *et al.*, 2016).

In this study, the incidence was 8.57% including fistula in ano was dominant about (14.28 %) including high type (8.57%) treated by seton staged surgery and low type (5.71%) treated by fistulotomy. perennial absesse (8.57%) treated by drainage.Medical therapy is the cornerstone treatment for perianal fistulas. Surgical intervention is reserved for individuals with abscesses or sepsis (Toh, *et al.*, 2016).

Low CD perianal fistulas are amenable to fistulotomy treatment. Complex or high CD fistulae should be treated with long-lasting setons (Toh *et al.*, 2016), so diversional stoma for perianal disease should be reserved for difficult cases refractory to medical therapy and drainage (Toh *et al.*, 2016).

In the present study, demonstrated that (65.71%) of patients required more than one surgery, the vast majority for abdominal Crohns. Intestinal obstruction in the form of stricture treated by stricturoplasty (8.57%) because stricturoplasty has the advantage of small bowel preservation and prevention of short bowel syndrome.

Wound infection occurs postoperatively in our Crohn's disease patients is (28.55%) because of multifactorial include complication of medical treatment and malnutrition. Risk factors for anastomotic complication include intra-abdominal abscess, fistula, malnutrition, steroid usage, and recurrent clinical episodes.

CONCLUSION

✤ Although the medical treatment is the corner stone in management of Crohn's disease but early referral to digestive surgeon is preferable to decrease the suffering of the patients and improve the outcome.

✤ The ileocecal region is the most common site of involvement by Crohn's disease, hence, the surgery for this area is the most frequent in form of ileocecal resection.

✤ The role of fecal diversion (ileostomy) is important in plan of surgical management of Crohn disease especially in malnourished patients and long term of steroid therapy.

✤ Our goal in managing small bowel Crohn's disease is to preserve as much as we can length of the bowel by performing stricturoplasty rather than resection to prevent short bowel syndrome.

✤ Conservative surgery in perianal involvement is preferred rather than the radical one.

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