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SURGICAL TREATMENT OF CROHN'S DISEASE

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ABSTRACT

Crohn's disease is a chronic inflammatory condition that can affect any segment of the digestive tract. Its etiology is unknown and its management is multidisciplinary.The treatment of Crohn's disease is mainly medical, but surgery remains necessary in the majority of cases. This surgery is reserved for complicated forms orresistant to medical treatment. This work consists in a retrospective study of a serie of 106 patients undergone surgery for Crohn's disease, collected in the department of hépatogastro-enterology , in the CHU Mohammed VI of Marrakech. Over a period of thirteen years from January 2004 to September 2018. The average age of our patients was 35 years. with extremes from 17 to 70, with a male predominance with a sex ratio of 1.4. The indication of surgery was a stenosis symptomatic in 64,1% of cases, a digestive fistula in 14,1% of cases and an association of the both in 12% of cases. The indication for surgery was urgently asked for 10% of patients, For 3 patients, this was a table of appendicitis (3%), for 3 patients it was an acute intestinal obstruction (3%), a deep abscess in two patients (2%) and peritonitis was the surgical indication in 2 patients (2%). The surgical procedure consisted of ileocecal resection in 40 patients, ie 37.7% of cases. Right hemi colectomy was performed in 18 patients (16.9%) and hailectomy in 10 patients (9.4%). The postoperative complications found in our series were anastomotic fistula in only one case, with two cases of septic shock death. Three cases of infection of the wall, and one case of incisional hernia. In addition, no case of surgical recurrence was noted. Maintenance treatment was given to immunosuppressive agents in 86% of our patients, and derivatives in 14%, or to prevent postoperative relapses.

Keywords : *Crohn's disease - Surgery - Bowel resection Postoperative recurrence - Maintenance treatment.*

INTRODUCTION

Crohn's disease is an idiopathic and transmural granulomatous inflammatory enterocolitis affecting the entire digestive tract from the mouth to the anus and evolving through periods of remission. The treatment of Crohn's disease is essentially medical. But surgery remains necessary in more than 80% of patients [1]. Whatever its type, this surgery will not cure the patient who will be exposed in the long term to the risk of recurrence on the remaining intestine, with a re-intervention rate for recurrence which ranges between 26 to 65% after 10 years of evolution [1,2; 3].

Surgery should not be indicated as first intention, but after failure of a well-conducted medical treatment or in case of complications. It should be as conservative as possible on the intestine, given

the chronic, relapsing and pan-intestinal character of Crohn's disease that can lead to malabsorption disorders and short hail [4].

The surgical decision must be part of a medico-surgical strategy in which the various therapeutic possibilities will be assessed, particularly with a view to preventing recidivism.

Purpose of the work;

The aim of our work is to describe the different surgical aspects of Crohn's disease, based on our series of cases and to detail the particularities of our context in this type of care.

MATERIALS AND METHODS

Our work is a descriptive retrospective study on 106 cases of Crohn's disease operated, collected in the service of hepatogastroenterology and proctology of Mohamed VI University Hospital of Marrakech. We have been satisfied with cases of abdominal surgery. Crohn's disease, collected in the service of hepatogastroenterology and proctology of Mohamed VI University Hospital of Marrakech over a period of 13 years from January 2004 to September 2018. We excluded from the outset of this study the cases of Crohns operated for pure ano-perineal involvement, the statistical analysis was carried out by SPHINX v:

RESULTS AND DISCUSSION

The average age was 35, with extremes of 17 to 70 years. Young adults with an age ranging from 20 to 40 years were involved in 64% of cases (68 cases).

Patients in our series were 62 men (58.49%) and 44 women (41.5%), with a sex ratio of 1.4

A history of smoking was found in 39 patients (36.7%), 24 patients were already appendectomized (22.6%), among whom, patients developed postoperative fecal fistula (0.9%). Five patients were already operated on for anal fistula (4.7%). A family history of IBD was found in only 5 patients and a dysimmunitary site was present in only 4 patients, one vitiligo in one case and one ankylosing spondyloarthropathy in three cases. (Table I)

Table I: Antecedents found in the series

Antecedent	number	percentage
smoking	39	36,7%,
appendicectomisés	24	22,6 %,
an anal fistula	5	5%
A family history of IBD	5	5%
a dysimmunitary ground	4	3

In our series, the complication prone to surgery was inaugural in 10 cases (9%). However, only 36 cases were known to have Crohn's disease (33%), and for the remaining cases, they were symptomatic for years without being labeled Crohn's disease (57%).

The average time between onset of symptomatology and surgery was 5 years and 3 months, with extremes of a few hours to 12 years.

For medical treatments priced by MC patients in the period between onset of symptomatology and surgery, patients had already received medical treatment for their pathology (Table II)

Table II: Medical treatments priced by MC patients

Medical treatments	Number	Percentage
Anti-inflammatories	7	6,6 %
corticosteroids	15	14,1%
immunosuppressive	50	47%
Anti TNF alpha	4	3,7%
antibiotics	2	1,8%

The clinical symptomatology was varied. Atypical chronic abdominal pain was present in 47 patients (44.3%) and 49 patients (46.2%) had chronic diarrhea. Koenig's syndrome was present in 57 patients (53.7%). Seven patients consulted for an enterocutaneous fistula (6.6%), three patients for faecaluria (2.8%). General signs of slimming and asthenia were noted in 43 patients (40.56%). Ten of our patients were seen in an acute abdomen chart (9.4%), which was an occlusive syndrome in 3 patients (2.8%), acute pain in the right iliac fossa in 5 patients (4.7%) and generalized abdominal pain in 2 patients (1.8%).

The general examination found a fever in 11 patients (10.3%).

The abdominal examination revealed an abdominal mass in 7 patients (6.6%), an abdominal defense of the right iliac fossa in 5 cases (4.7%), and generalized in 4 cases (3.77%). Localized abdominal tenderness was found in 39 cases (36.8%), and generalized in 16 cases (15%). Enterocutaneous fistula was found in 7 cases (6.6%)

In the remaining cases the clinical examination was without abnormality.

Biological assessments involving a blood count, an inflammatory balance and an albumin were performed in all our patients. The analysis of the results revealed a leukocytosis in 38 cases (35.8%), a hypochromic microcytic anemia in 95 cases (89.6%) in 56 cases, accelerated ESR and elevated CRP in 68 cases (64.1%) and hypoalbuminemia in 41 cases (38.6%). All patients treated with immunosuppressive drugs had previously received a preimmunosuppressive assessment containing HIV, HVB, HCV, EBV, VZV, and tuberculosis status.

The morphological assessment:

Uninhabited abdomen radiography (ASP) was requested from 3 of our patients (2.8%) in front of an acute bowel obstruction. She showed hydro-areal levels always of hailic type

The abdominal ultrasound was performed in 98 cases (92.4%), for assessment of throbbing or acute abdominal pain, abdominal mass or impasto. It was normal in 12 patients In the remaining cases, it objectified various lesions dominated by intestinal wall thickening.

Abdominal computed tomography: was performed in 9 patients (93%) looking for a deep abscess. It showed an intestinal wall thickening in 91 cases (86%), an abscess of the right iliac fossa in 2 cases and psoas in 2 other cases, air bubbles in the bladder in 2 cases (2%) and an agglutination of

intestinal loops in 2 cases (2%).

The passage of small bowel (TG) was performed in 20 patients in our series (18.8%) and was normal in 3 patients (2.8%). In the other cases, the lesions evidenced were dominated by ileal stenosis.

Table III: Distribution of lesions objectified by the transit of hail

Lesion	Name of case	percentage
Stenosis:	**12**	**70,5%**
Ileo-caecal	**8**	
Ileo-terminal	**3**	
multifocal	**1**	
Fistula:	**4**	**23,5**
one-eyed	**1**	
Ileo-small bowel	**1**	
Ileo-colic	**2**	
Ileocecal ulcer	**1**	**6%**
distension caecum	**1**	**6%**
Retraction of the ICD	**1**	**6%**

The barium enema was performed only in 2 patients. He showed a rectovaginal fistula in one case and a recto-caecal fistula in the second case.

Entero-MRI was performed in 60 patients (by lack of means), already followed for crhon disease

The found elements, suggestive of Crohn's disease were classified parietal thickening with contrast enhancement target or double halo in all patients, sclerolipomatosis with a combed appearance of mesenteric fat in 30 patients and complications: stenosis in 40 patients, fistulas 10 patients, collection at four patients

Entero-MRI was performed in 30 patients (by lack of means), already followed for crhon disease (Table IV).

Table IV: Results of lesions found in entero-MRI

Radiological characteristics	Percentage
Digestive thickenings	60%
hyperintense	100%
Enhancement:	
-homogeneous	6%
-target	10%
PDC intensity: intense	19%

Comb sign	30%
lymphadenopathy	33%
Peridigestive infiltration	45%
sclerolipomatosis	25%
Ulceration	0%
stenosis	50%
digestive fistulas	13%
'abscess	3%

Gastroscopy and iléo-colonoscopy

They were performed in all our patients. They were performed before the surgical procedure in our patients operated on a programmed basis, and after the surgery for the patients operated in emergency.

gastroscopy did not reveal ulceration or gastric or duodenal stenosis. In 83 cases (78%), she found an appearance of gastritis or erythematous bulbitis,

ileo-colonoscopy was performed in all patients (90.5%) and revealed lesions such as aphthoid ulceration, pseudopolyps (Fig.1), stenosis, fistula and exulceration. The involvement was segmental in 30 patients (28%)

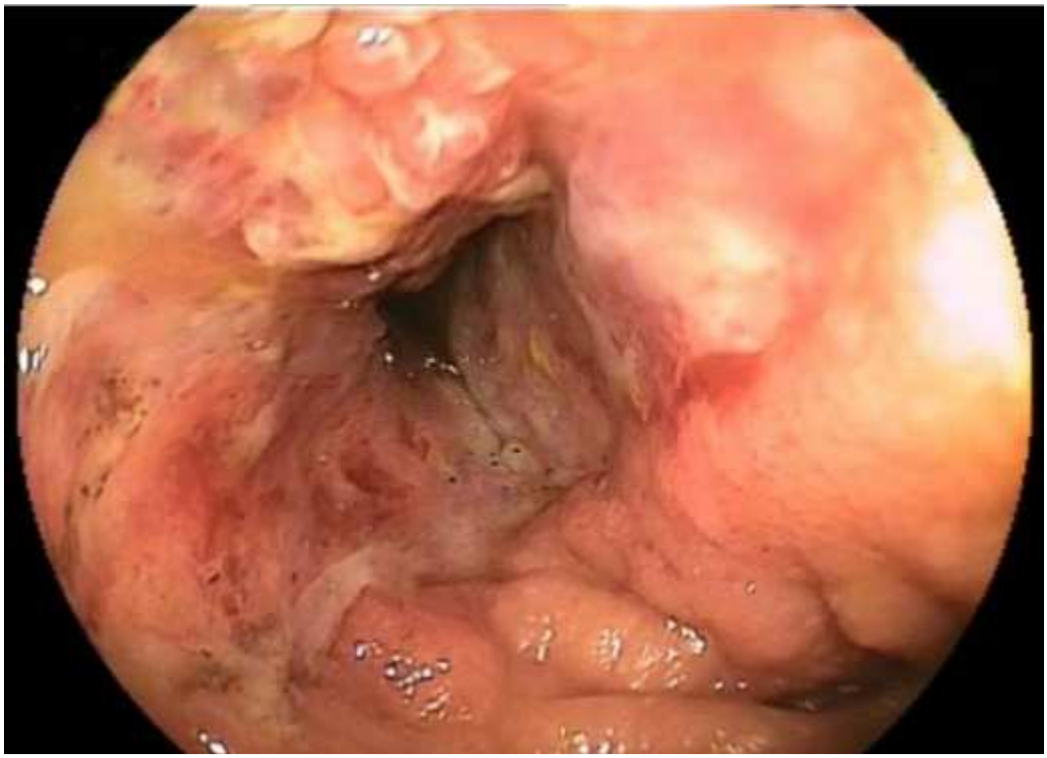

Fig.1 : Pseudopolyps in the cecum at colonoscopy

In our series, the surgical indication was programmed in 96 patients (90.5%). The surgical

indication was urgently asked in 10 of our patients (10%). represented in Table V:

Table V: Surgical indications in our series

Indication	Type of intervention	Number of cases	percentage
Symptomatic stenosis	programmed	68	64,1 %
Digestive fistula		15	14,1%
Association of stenosis and fistula		13	12,2%
appendicitis	Emergency	3	3 %
Acute bowel obstruction		3	3 %
Deep abscess		2	2 %
peritonitis		2	2 %

-the approaches are dominated by laparotomy (Table VI):

Tables VI: The different surgical approaches used in our series

Look first	type	number	percentage
laparotomy		**103**	
	Mac burny	1	**1%**
	Transverse	3	**3%**
	Median	100	**97**
	Right lumbar	1	**1%**
laparoscopy	Convert to laparotomy	1	**1%**

Surgical exploration

The operating time in our patients allowed the detection of multiple lesions dominated by intestinal strictures.

In 40 cases (37.7%) (Fig.2), there was single bowel stenosis, 21 patients had terminal ileal stenosis, 7 cases had ileocecal stenosis, and small pelvic stenosis. in 12 cases, and 28 cases (26.4%), digestive fistulas in 30 cases (28.3%), 7 of which were enterocutaneous (fig.3), 11 were ileocolic, 2 were haemorrhagic; -grelics, one was colo-colic, one was colo-rectal, six were enteric-vesical, two were rectovaginal and were one-eyed.

Adhesions were present in 19 cases (17%) and intra-abdominal abscess was found in 6 patients (5.6%), of whom 4 were in the FIDte and 2 in the psoas. Surgical exploration found an inflammatory mass in 8 patients (7.5%), a necrotic intussuscephalic loop in one patient (0.9%) and perforation of the last ileal loop in 7 patients (6.6%).), a distention as a lover of a stenosis in 4 other cases, and mesenteric lymphadenopathies were objectified in 5 patients.

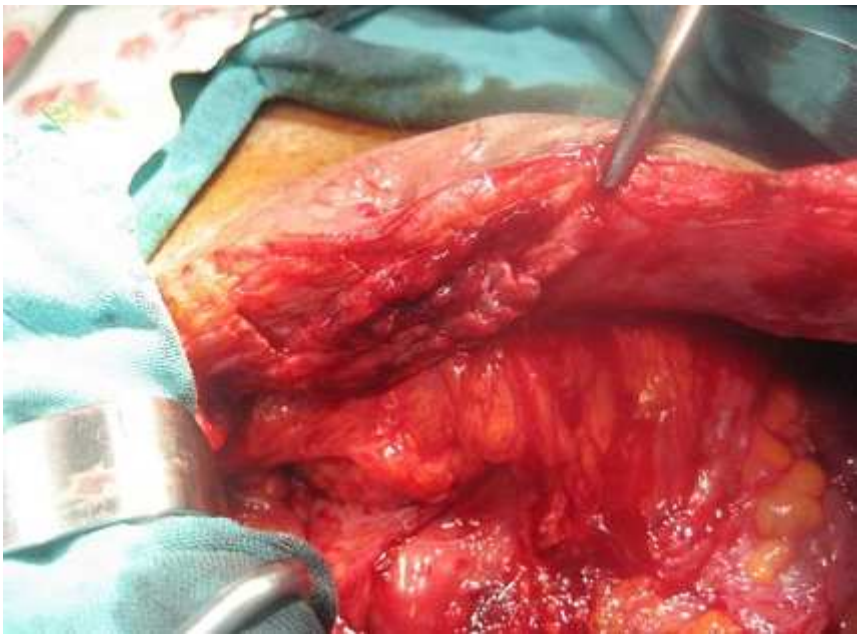

Fig.2: Perioperative view of an enterocutaneous fistula

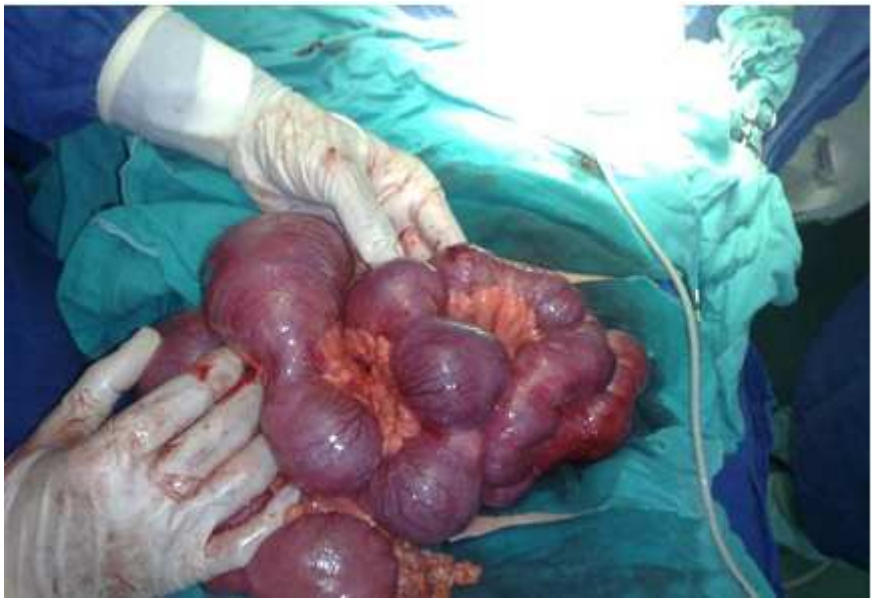

Fig.3 : Multiple layered steloses

The surgical gesture:

The surgical procedure consisted of ileocecal resection in 40 patients, ie 37.7% of cases. Right hemi colectomy was performed in 18 patients (16.9%) and hailectomy in 10 patients (9.4%). Other gestures were performed less frequently such as:

• An appendectomy in 3 cases (2.8%).

• Abscess drainage in 4 cases (3.7%). With a surgical resection for delayed resection (after 3 weeks in 2 cases)

• Resection of a fistulous tract in 12 cases (11.3%).

• Adhesiolysis in 19 cases.

Note that in some patients, more than a single gesture were made or even 2 types of intestinal resection

The restoration of continuity was realized from the outset in 66 of our patients (57.5%). It was an ileocolic anastomosis in 46 patients. It was an end-to-end manual type of anastomosis in 28 patients (60%), manual lateral-lateral in 17 cases (37%) and laterally lateral mechanics in one case (2%). A hailstone haploid anastomosis was performed in 10 patients who underwent hailectomy. In 2 of our patients, operated on for acute peritonitis, a temporary stoma with a restoration of continuity within 3 months was achieved secondarily.

Postoperative treatment:

All our patients had benefited in immediate postoperative analgesics to

based on paracetamol, combination antibiotic (amoxicillin clavulanic acid) and metronidazole, and heparin preventive therapy.

Evolution :

There were 2 cases of postoperative death in our series, 1.2% of cases. Both cases died immediately postoperatively in a septic shock chart. The morbidity was 4/106. Three patients presented with a wall infection and were treated with local care and antibiotics. A patient complained of anastomotic fistula, the surgical revision resulted in a stoma with good evolution.

ANATOMOPATHOLOGICAL EXAMINATION

It was made from excision or appendectomy specimens. The average length of resected hail was 27.4 cm, with extremes of 8 cm to 82 cm, it was not specified in 14 cases. The exeresis limits were reached macroscopically in twelve cases and microscopically in 20 cases. In the other cases, they were healthy macroscopically and microscopically. Histological signs suggestive of Crohn's disease were present in 87 cases (82%)

Maintenance treatment:

Postoperatively all our patients were put under maintenance treatment to maintain remission. This treatment consisted of an immunosuppressive treatment in 81 cases (86%): azathiopurine in 66 patients, 6-mercaptopurine in 15 patients (due to lack of means or intolerance to azathiopurine), methotrexate in a single patient. Mesalazine was used in 13 patients. These are maintenance treatments in progress at the time of the exploitation of the follow-up files of our patients.

Long-term follow-up

It was noted the occurrence of flange occlusion in a single patient and resolved spontaneously. And an incision on the operative scar in another patient for whom she was operated on. On the other hand, no case of surgical recurrence was noted.

RESULT AND DISCUSSION

Discussion

Crohn's disease is considered ubiquitous, since isolated cases have been reported in just about every country in the world [5; 6].

the annual incidence of Crohn's disease is between 3.7 and 7.0 cases / 100,000 inhabitants. In northern France in 1997-1999, it reached an increase of 23% over the period 1988-1990.

The prevalence rate of Crohn's disease, on the other hand, is quite variable in the studies. In Europe, it varies between 8.3 and 214 cases / 100000 inhabitants [6; 7]. The average age at the time of diagnosis is on average 10 years. A slight female predominance has been inconsistently described in Crohn's disease

The pathogenesis of CM is not fully understood to date. According to the most recent hypotheses, the participation of genetic and environmental factors such as the modification of the intraluminal bacterial flora, and the increase in intestinal permeability cause a deregulation of the intestinal immunity, which results in gastrointestinal lesions. [4; 5,8].

In MC, 3 different phenotypes have been described: stenotic forms with type of symptomatic stenosis or acute intestinal obstruction, perforating (or penetrating) forms: fistulas, peritonitis and abscesses and inflammatory forms (non-stenosing and non-perforating). In comparison with the colon, involvement of the small intestine is complicated by more stenosing and perforating forms, the formation of a fistula complicating in more than 90% of cases a stenosis.

In CD, all surgery (except in case of complicated form revealing the disease) is preceded by medical treatment, with reassessment and discussion of it postoperatively for the prevention of relapses according to the risk of recurrence of each patient. But it is important to bear in mind that, in the vast majority of cases, surgery is only indicated in case of failure of medical treatment, the progress of these, including the advent of anti -TNF (very effective in the severe forms of the disease) and immunosuppressive treatments (reducing the risk of recurrence after obtaining a remission) should not delay the time of surgery [4; 9].

Before deciding on the intervention, an analysis of the patient's conditions and a recent assessment of intestinal lesions are essential. In general, nutritional status is assessed by the importance of weight loss, the value of albumin and hemoglobin levels, and the existence of an inflammatory syndrome [4; 5].

Morphologically, a hail transit is essential. Colonoscopy can be used to recognize colon involvement as a result of localization of Crohn's disease or as simple inflammatory lesions indicating a complication such as ileocolic fistula. An abdominal CT scan is useful for inflammatory mass or abscess complications or when fistulas of any type are feared [4].

The surgical indications will therefore be asked in case of failure, ineffectiveness or contraindication to medical treatment. They are evident in cases of "non-inflammatory" stenosis, resistant to well-conducted medical treatment, limited length, scarring and symptomatic (with Koenig syndrome), or dysplasia, or even cancer [10]

In the perforating forms of the disease, the operative indication is also easily and quickly posed. The following situations require intervention: peritonitis, abscess responsible for an occlusive syndrome, painful abdominal mass in case of deep abscess, enteric fistula cutaneous, symptomatic ileo-ileal or ileocecal fistulas with diarrhea and / or malabsorption due to the creation of an anatomical "bypass" [10,11].

Finally, there is no indication of "preventive" surgery for the disease, except in case of discovery of dysplastic lesion in flat mucosa or DALM (Dysplasia Associated Lesion or Mass).

Surgical management of the lesions of the small intestine in the MC has as main principle that of the digestive saving, avoiding as much as possible the occurrence of a intestinal insufficiency with a short bowel syndrome due to the iterative intestinal resections or too extensive [12].

The most common interventions performed in CD, for the small intestine, are ileocecal resections

(ICR) for symptomatic stenosis of the terminal ileum. In a general way, the restoration of the digestive continuity is realized in the same operating time, with a right ileocolic anastomosis. Lateral mechanical anastomosis has been considered preferable for a while, as it is potentially associated with a lower recurrence rate at the pre-anastomotic ileum due to a larger caliber [10,13].

ECCO recommendations state that stricturoplasty is a safe alternative to resection for stenoses less than 10 cm in order to reduce the risk of short hail [14].

Of course, in cases of emergency surgery for generalized peritonitis by perforation of the hail, temporary stoma is required.

Approximately 21% of ileal forms of MC may be complicated by an intra-abdominal abscess, which may be intraperitoneal (18%) or less often retro-peritoneal, in the psoas muscle (3%), a medical treatment combining antibiotic therapy and parenteral nutrition may be attempted. In both cases, surgery will be considered 6 weeks later (usually a CIN) with local conditions that will most often allow immediate recovery of digestive continuity [11].

The surgical procedure for ileo-vesical fistulas does not differ much from that performed in the absence of fistula. The fistulous orifice (most often located at the level of the bladder dome), when it is highlighted, is closed by a simple suture [11,15].

An ileo-sigmoid fistula is sometimes asymptomatic and is found to be intraoperative in 25% of cases, treated with a simple suture or colon resection at a minimum [11].

Rectovaginal fistulas should only be surgically treated if the symptomatology is disabling, There are many surgical methods for the repair of rectovaginal fistulas: direct endorectal or endovaginal or inter-ano-vulvar closure of the fistula; to be associated); fistulotomy; seton; even proctectomy [16,17].

In the case of ileocolic recurrence and staged forms, reoperation is indicated only in case of failure of medical treatment, with resection of the ileocolic anastomosis and supra-anastomotic small bowel, respecting the same principles as when initial surgery

The choice of laparoscopy for performing this procedure can only be justified if it seems technically feasible with an acceptable conversion rate. It must also be associated with a postoperative morbidity-mortality rate and recurrence that is equivalent to or lower than laparotomy surgery [18,19].

Surgical management of colonic and rectal disorders in MC seems more difficult than for the small intestine and aims to delay as much as possible one day of total coloproctectomy with definitive terminal ileostomy.

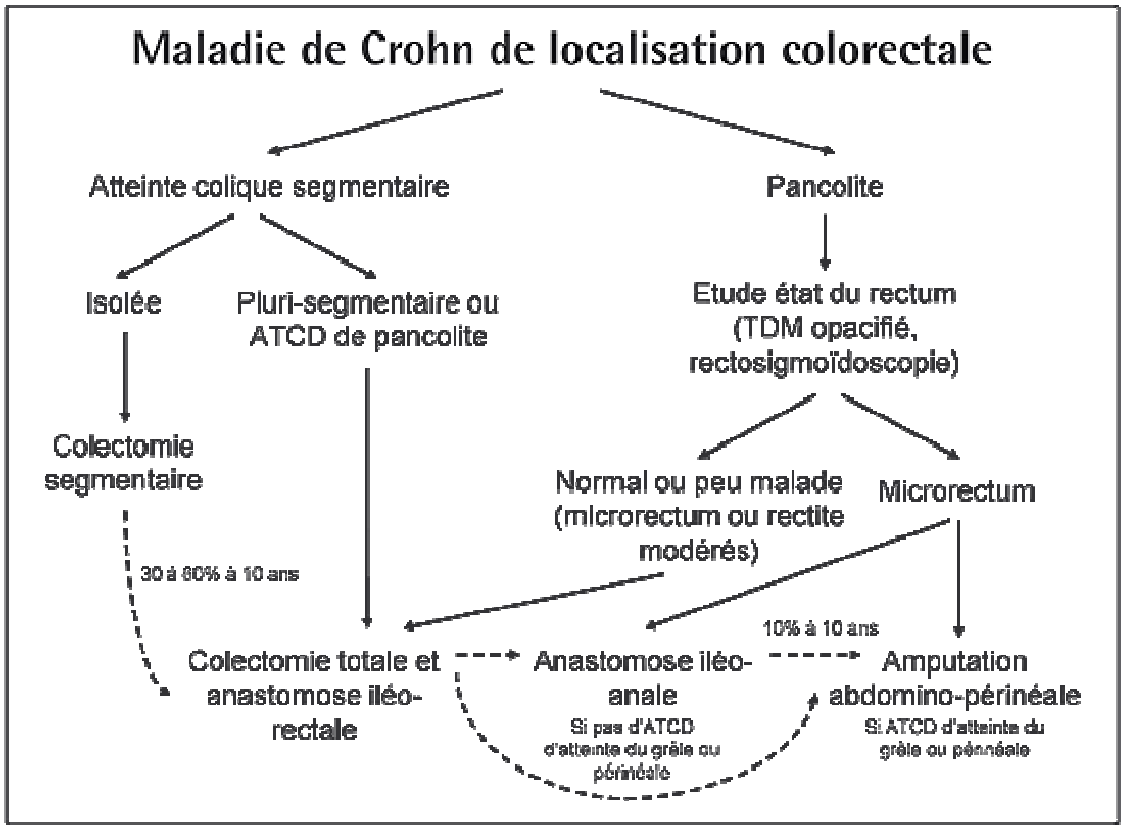

Fig 3: algorithm for the management of colorectal CD [20].

The type of intervention carried out in case of CAG is today the object of a consensus. The principle is to remove almost all the diseased colon, without making anastomosis. It consists of performing a subtotal colectomy (CST) without restoring digestive continuity, with double ileostomy and sigmoidostomy [21].

CONCLUSION

The chronic and recurrent nature of Crohn's disease means that the majority of patients with the disease have surgery during the disease.

The management of the MC requires a close collaboration between gastroenterologist and surgeon and must also include other specialists (resuscitator, anatomopathologist, psychiatrist, nutritionist ...)

It is important for doctors to have surgery at the right time in the history of the disease, to avoid as much as possible the situations where it would be more deleterious than beneficial because of its nutritional, functional consequences. and psychological

REFERENCES

[1] Kappelman MD. The prevalence and geographic distribution of Crohn's disease and ulcerative colitis in the United States. Clin Gastroenterol Hepatol Off Clin Pract J Am Gastroenterol Assoc. **2007** Dec;5(12):1424–9.

[2] Ng SC. Worldwide incidence and prevalence of inflammatory bowel disease in the 21st century: a systematic review of population-based studies. Lancet **2017**;390:2769-2778

[3] Ng WK. Changing epidemiological trends of inflammatory bowel disease in Asia. Intest Res **2016**;14:111-119

[4] Billioud V. Preoperative use of anti-TNF therapy and postoperative complications in inflammatory bowel diseases: a meta-analysis. J Crohns Colitis. **2013** Dec;7(11):853–67.

[5] Cosnes J. Epidemiology and natural history of inflammatory bowel diseases. Gastroenterology. **2011** May;140(6):1785–94.

[6] Loftus CG. Update on the incidence and prevalence of Crohn's disease and ulcerative colitis in Olmsted County, Minnesota, 1940-2000. Inflamm Bowel Dis. **2007** Mar;13(3):254–61.

[7] CS.Higgens , RN.Allan «Crohn's disease of the distal ileum » **Gut1980** ; 21 : 933-40

[8] Lesage S. CARD15/NOD2 mutational analysis and genotype-phenotype correlation in 612 patients with inflammatory bowel disease. Am J Hum Genet **2002**;70:845-57

[9] Prideaux L. Maladie inflammatoire chronique de l'intestin en Asie: une revue systématique. J Gastroenterol Hepatol. **2012**; 27 : 1266-1280.

[10] Chan G. Évaluation endoscopique de la maladie inflammatoire de l'intestin: coloscopie / œsophagogastroduodénoscopie. Gastroenterol Clin North Am. **2012**; 41 : 271–290.

[11] S. Abdalla · Impact des traitements de la maladie de Crohn sur la morbidité chirurgicale Colon Rectum (**2017**) 11:140-146

[12] Rahal MA .Résultats chirurgicaux chez les patients atteints de maladie intestinale inflammatoire subissant une colectomie: résultats d'une base de données nationale. Acta Gastroenterol Belg . **2018** juillet-septembre; 81 (3): 387-392.

[13] Therrien A Le recrutement de Activated Neutrophiles corrélats avec la maladie de gravité dans adulte Crohnde la maladie . Clin Exp Immunol . 22 octobre **2018**: 10.1111 / cei.13226.

[14] Florian Rieder, MD. Prise en charge de la fibrose intestinale chez les patients atteints d'une maladie intestinale inflammatoire. Gastro-entérologie et hépatologie.Février **2018** - Volume 14, Numéro 2

[15] CAROLINE DU SUD. Prise en charge de la maladie de Crohn à Taïwan: directive consensuelle de la société taïwanaise des maladies inflammatoires de l'intestin Intest Res , 15 (3) (**2017**) , pages 285 – 310

[16] Gionchetti P. 3rd European Evidence-based Consensus on the Diagnosis and Management of Crohn's Disease **2016**: Part 2: Surgical Management and Special Situations. J Crohns Colitis. 2017

[17] Lee MJ. et al. ACPGBIPerianal Crohn's Disease Group. Association of Coloproctology of Great Britain and Ireland consensus exercise on surgical management of fistulating perianal Crohn's disease. Colorectal Dis. **2017**

[18] Milsom JW. Prospective, randomized trial comparing laparoscopic vs. conventional surgery for refractory ileocolic Crohn's disease. Dis Colon Rectum **2001**;44:1-8; discussion -9

[19] Frolkis AD, Lipton DS. Incidence cumulative de la deuxième résection intestinale dans la maladie de Crohn: une revue systématique et une méta-analyse d'études basées sur la population . Am J Gastroenterol **2014**; 109 : 1739-1748.

[20] A.CHAMPLAUT, S.BENOIT, A.ALVES, Y.PANIS «Le traitement chirurgical des atteintes

coliques et rectales de la maladie de crohn». Gastroenterol Clin Biol.**2004** ;28 :882-92.

[21] Ma C, Crespin M, MC Proulx et al. Complications postopératoires après colectomie pour la colite ulcéreuse: une étude de validation . BMC Gastroenterol **2012**; 12 : 39.