Large intestine

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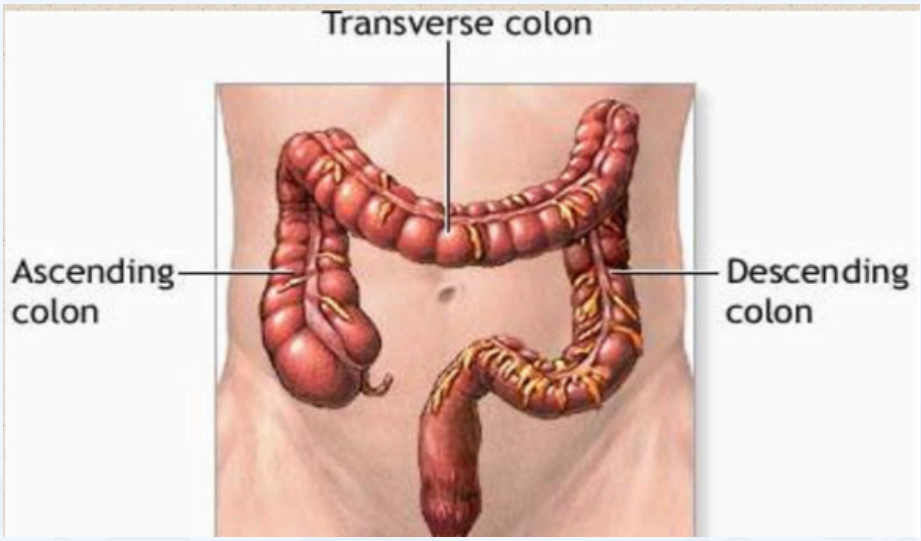
surgical anatomy



- There is three tenia in the large bowal not found in small bowel which is a condensed longitudinal fibers of the large intestines's wall , start from the base of appendix and ends in sigmiod colon , so it's not found in the rectum that's why there is no diverticulosis in the rectum because it makes weakness in large intestines's wall, so we find diverticulosis in ascending ,transverse and descending colon and 90% in sigmiod colon.

- Haustration :just found in large intestines (characteristic to it) which is contractions of circular muscles , if we see dilated loope with hostratsion in plain abdominal x-ray indicates intestinal obstruction involve Large Bowel !

Absent haustration = it's pathology and we call it pipe-like appearance , found in ulcerative colitis disease .

- Appendices epiploicae : fatty tissue found just in large bowel and it found more in obese female and become larger and thicker ,its one of rare causes of non specific acute inflammatory abdominal pain due to torsion of appendices epiploicae or inflammation so called (appendagitis) , it's rare due to the difficulty to diagnosed

(could be by MRI).

- In intraperitoneal which has a mesocolon which ar e transverse colon and sigmiod colon ,so they more liable for volvous & torsion(M.C site is sigmoid) while the ascending and decending colon are fixed so they not liable for volvous .

- If there truma from the back , it will penetrate and injure the posterior wall of colon (retroperitoneum) —>leak the contents of large bowel and not going to peritoneal cavity so there no irritation of peritoneum —> no gaurding ,no tenderness and no rigidity so the symptoms will delay to three days to appears.

- The diamter (Caliber) of right colon wider than left , also the content of right is semi-solid while in left is solid, so the tumor in left side earlier presentation of symptoms than right and earlier diagnosed .

- The truma in high velocity injury of the bowel : the [left side] affected more than the right due to its content (the solid organs are affected more severe in high velocity trauma) , we call it “shattering of organs”.

Clinical anatomy

- This is a normal x ray

- Lage bowal and persistent haustration

Diet and large bowel diseases:

-Diet quality :
- Fibre diet
- Antioxident rich diet
- Dietary lectins
- Carcinogens in diet

-frequency of defecation &contact time

Excretory systems of body :
1. GIT (rectum & colon)
2. Urinary sys.
3. biliary sys.
4. Respiratory
5. skin
6. lymphatic

- Most diseases are seen in excretory systems, because the waste product accumulated in them , the more the system preserve the waste product = the more probability to infections and diseases

The more frequent of defecation —> the less time of the content in bowel —>the less of diseases .
So the constipation lead to a lot of disease and the quality of the diet responsible about it

DIVERTICULOSIS Of THE COLON

Is a sac like protrusion in the colonic wall,
developes as a result of herniation of mucosa and submucosa through a point of weekness in the muscular wall.

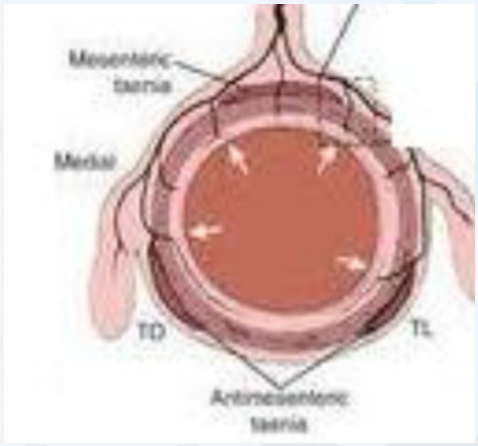


Fig. 1. Hernia sac content: a large amount of small bowel with Meckel

- colonic diverticulum

It's a false diverticlum:
doesn't contain the all layers of bowal , between mesentric tenia and ant-mesentric tenia in latral border , found in ascending ,transverse, descending colon and 90%in sigmiod colon.

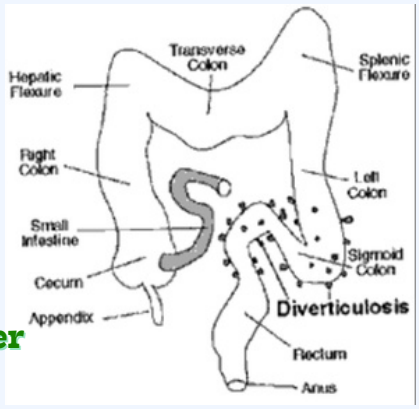
-Meckle diverticulum

It's a true diverticlum :
contains the all layers of bowal , anti-mesentric border ,the anatomical site is 2 inch in lenaght and 2 feets from illeocecal valve.

DIVERTICULAR DISEASE

- Typically acquired disease ,rarely may be congenital.
  - Ccongenital type is commonly associated with ascending colon (right side)
  - diverticular disease increase with age because higher risk of constipation

- Increase with age :
  5% befor age of 50 y.
  30%after age of 50y.
  50 % over 70y.
  66% over 85y.



- Common in left side , sigmoid colon : 90%

Because the content is solid , and contactions will be stronger

- M: F ratio equal .
- Rare in the 3rd world , is related to the fibre diet .

ETIOLOGY

1. Precise etiology of this disease is unknown.
- High intraluminal pressure and a weak colonic wall
-The condition also may be caused by abnormal colonic motility.
2. Genetic & enviromental factors may play a role.
- Defective muscular structure, defects in collagen consistency.
3. Predisposing factors:
a.obesity.
b. Dec. physical activity.
c. Alcohol, coffee , cigaret smoking ,low fibre diet.

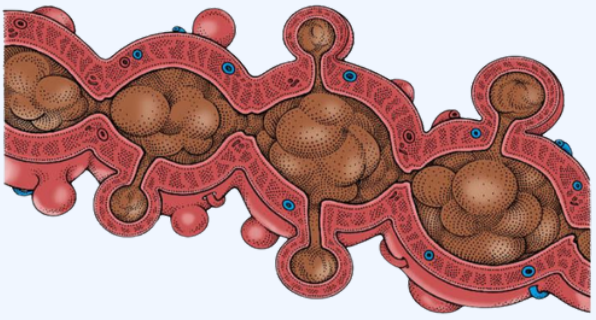
Note :constipation is the main cause of increased pressure in the colon, making the muscles strain to move stool that is too hard.

Note :The excess pressure caused by the straining makes the weak spots in the colon bulge out, forming diverticula.

Occur in the lateral wall

- **Saccules due to hypertrophic circular muscles**

PATHOLOGY:



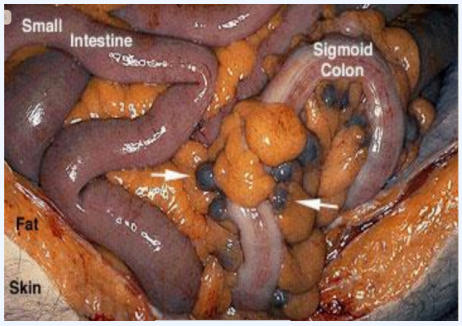
1. It is a pseudo diverticulum.
2. Usually found between mesenteric &anti mesenteric taenia.
3. occures at the week sites in the circular m.,mesen.vesseles penetration.

Which lead to bleeding and lower gi bleddind due to high pressure to main artery in mesentric vessel

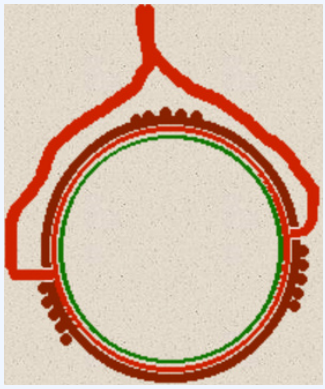
4.Elevated I.L. pressure by tonic &rythmic contractions result in segmentation " nonpropulsive contractions produce isolated segments" .
5.Thickenning of long.&circular muscles can lead to narrowing of colonic lumen.

The interance of mesenteric vessels is a site of weakness , so prone to develop diverticulosis, and could cause severe lower gi bleeding

Sigmiod vessel penetrates laterally the sigmiod wall,which is a weakness site so if threr high pressure could lead to bleeding.



The macroscopic to see diverticulosis



TERMINOLOGIES

Diverticulosis:
The presence of multiple diverticulae "generally implies to an absence of symptoms"
Diverticular disease (presence of signs&symptoms):
Any clinical features caused by diverticulae including complications.
Diverticulitis:
The presence of inflamatory process associated with diverticulae.

CLINICAL FEATURES

-DIVERTICULOSIS :
1.Usually asymptomatic.
2.Lower abdominal colicky pain & flatulence which disapear after defecation .

Symptoms & signs of acute diverticulitis:

The difference between acute appendicitis and diverticulitis:

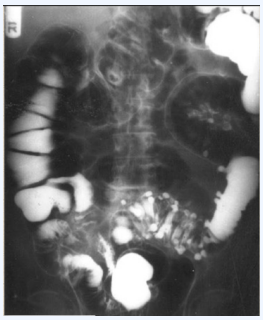
- **The shifting pain in acute diverticulitis is hypogasric shifted to left iliac fossa While in acute appendecitis the pain is peri umbilical shifted to right iliac fossa**
- **The 2nd difference is by doing PDR examination: The tenderness in acute app.is in the right side of rectal wall particularly in pelvic app, While in diverticulitis the tenderness is in left side of rectum Otherwise all what is mentioned in the slide applied to both.**

a. Acute lt. Lower quadrant pain : severe &deep
b. Nausia & vomiting.
c. Fever,chills.
d.constipation,or alternating with bouts of diarrhoe.
e. urinary symptoms:dys,freq. Urg.
f. Tenderness,guardenning lt. lower quadrant.
g. leucocytosis.
h. Per rectal exam.:tender lt.side.

DIAGNOSIS

1. Clinical features
2. Radiology,Barium enema
3. sigmoidscopy,colonoscopy
4. CT
5. U/S

The normal large bowel.



Multi-diverticulosis in descending colon and the beginning of sigmiod colon by barium enema in x-ray.

Fecal impection of diverticulosis make pressure nicrosis and obstruction and make erosion and sever bleeding.

CT for diverticulosis

COMPLICATIONS:

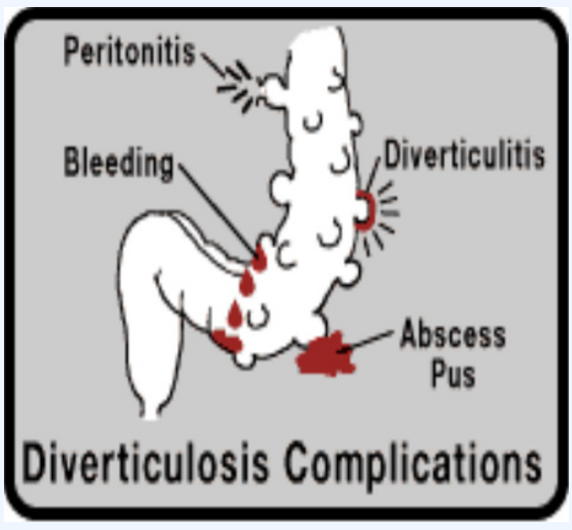
- Abscess

  Stage I - Pericolic abscess

  Stage II - Pelvic abscess

  Stage III - Purulent peritonitis

  Stage IV - Feculent peritonitis
- Bleeding
- fistula formation
- Intestinal obstruction



TREATMENT

DIVERTICULOSIS :
1. Hight residue (fiber)diet :
it lowers I.L.pressure, reduce symptoms,
& prevents complications.
2. Encourage physical activity,i.e walking
3.antispasmodic for pain.
4.antibiotics some times needed

TREATMENT of DIVERTICULITIS:

It depends upon the severity of symptoms and clinical findings :
A. Rest in bed
B. liquid diet or Administer intravenous fluid as indicated.
C.insert a nasogastric tube if patient is vomiting or colonic obstruction is suspected
D. Treating up the infection &inflamation :
antibiotics cover gram +ve, gram-ve, & anaerobes

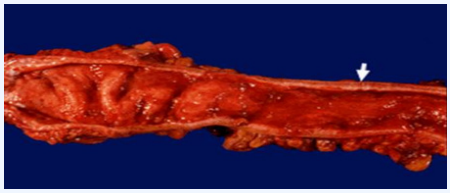
Treatment of Complications:

Usually Surgery !

1. perforation.
2.abscess.
3. Bleeding.
4. Fistula formation.
5. Large bowel obstruction.

ULCERATIVE COLITIS

A chronic disease characterized by diffuse mucosal inflammation of the colon and rectum.

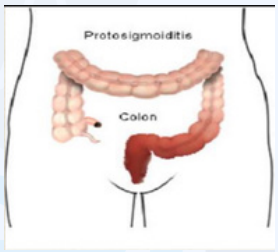


Epidemiology

1. Chronic inflammatory disorder limited to the rectum and colon ,relapses & remission is a character of the disease.
2. The precise etiology of ulcerative colitis is not well understood , abnormal activation of the immune system in the intestines is suggested.
3. Sex ratio: nearly equal with a female preponderance.
4. The onset of ulcerative colitis is most common between 15 and 40 years of age, with a second peak in incidence between 50 and 80 years.
5.Cigarette smokers have a 40 percent lower risk of developing ulcerative colitis than do nonsmokers .

Ulcerative Colitis and Smoking :

- Current smokers with ulcerative colitis tend to have fewer and less severe disease flare-ups.
- Researchers recently reported that smoking appears to alter the makeup of the various types of bacteria living in the intestinal tract.
- Ulcerative colitis is an immune disease; it occurs when a person's immune system mistakenly attacks and destroys the tissues of the colon .
- The relationships among intestinal microbes and the immune system are of particular relevance to inflammatory bowel disease.



PATHOLOGY

1. The disease starts in the rectum in 90% of the cases.(almost all cases !)
2. Difuse inflamation of the mucosa ,increase vascularity and congested mucosa with decrease ability to absorb water, lead to diarrhoe.
3. Multiple Minute Ulcer"undermined ulcer" with numerous haemorrahgic spots the engorged vesseles can give rise to bleeding. (deep ulcers in Crohn's)
4. The ulcerated areas are soon covered by granulation tissue ,later end with scarring & shortenning.
5. pseudopolyp formation found in about 15-20% of cases.
6. Microscopic changes include: inflammation of the crypts of Lieberkuhn and crypts abscesses.(histopathologic)
7. some patients due to an incompetent ileocecal valve , about 30 cm of the terminal ileum is affected.

Pseudo polyops

The difference between pseudopolps and the true-polyops

Pseudo-polyps : cluster of hyperplastic cells

True-polyps : contains vascular core and mesenchymal cells.

In crohns disease there is cobblestone appearance of mucosa layer.

due to edematous mucosa between ulceration !

But pseudopolyps are found in U.C

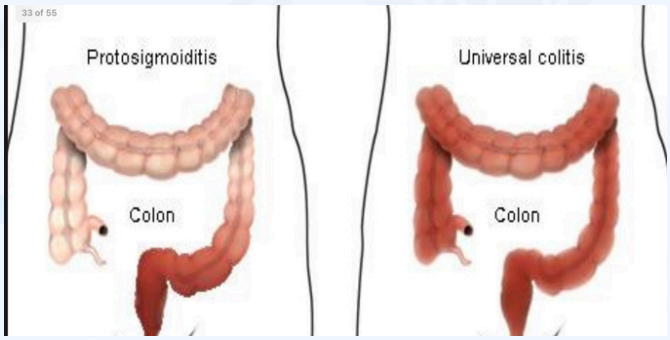
EXTENT OF THE DISEASE

The extent of colonic involvement can often, but not always, be predicted by the degree of symptomatology exhibited by the patient .

- **Proctitis : Involvement limited to the rectum.**
- **Proctosigmoiditis: Involvement of the rectosigmoid colon.**
- **Left-sided colitis: Involvement of the descending colon, which runs along the patient's left side, up to the splenic flexure and the beginning of the transverse colon.**
- **Pancolitis :Involvement of the entire colon,extending from the rectum to the cecum.**

More involvement —>more symptoms—>more liable for malignancy

There is false in these pictures:
Anal canal involvement and it never involved in the pathology of U.C. , That is why in treatment we anastamose the ileum to anal canal



CLINICAL FEATURES

1.The hallmark symptoms of ulcerative colitis are :
- intermittent bloody diarrhea
- rectal urgency
- tenesmus

Because there are ulceration, congested mucosa, rectal involvement

2.Abdominal pain,cramping ,subside after bowel movement.
3. WT loss.
4.Extra intestinal manefestation particularly arthritis, the commonest:
-Ankylosing spondylitis.
-skin lesions.
-Primary sclerosing cholangitis.

SIGNS

Especially in acute stage

Palor.
Dehydration.
Ematiation.
Mild fever.
Tachycardia.
Abdominal tenderness.
Blood on digital rectal examination.

EVALUATION OF SEVERITY

Clinical scale:

MILD : <4 motions /day ,no systemic signs.
MODERATE : >4 motions /day ,no systemic signs.
SEVER CASE : >4 motions /day +systemic signs :fever,tachycardia,wight loss,Hypoalbunaemia.

Endoscopic scale

A score of 0 is given for normal mucosa or inactive UC.
A score of 1 is given for evidence of mild friability, reduced vascular pattern, and mucosal erythema.
A score of 2 is indicative of moderate disease with friability, erosions, complete loss of vascular pattern, and significant erythema.
A score of 3 indicates ulceration and spontaneous bleeding.

Crohns dis. & ulcerative colitis

Similarities :
1.Both are chronic inflamatory diseases.
2. Both are of unknown etiology
3. Both have no cure following medical treatment
4. Both have exrtra intestinal manefestations
5.Presence of diarrhoe in both cases.

Non similarities:
1.Anatomical site in G.I. tract
2. Anatomical site in bowel wall.
3.Presence of skipped lesion.
4.Mucosal appearance
5.Surgical cure.

In ulcerative colitis there is a surgical cure unlike Crohn's disease

Differential diagnosis of ulcerative colitis:

includes any condition that produces chronic, intermittent diarrhea :

- **Crohn's disease,**
- **Ischemic colitis,**
- **Infectious colitis,**
- **Irritable bowel syndrome (IBS),**
- **Pseudomembranous colitis**

CLINICAL DIAGNOSIS & DIAGNOSTIC TESTING

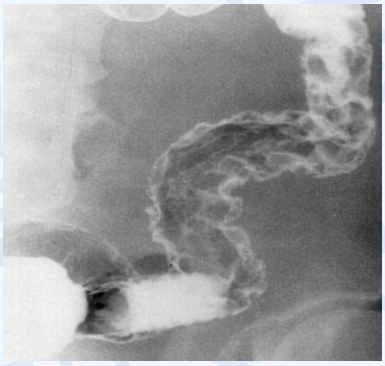
- The clinical history can be used to differentiate the various etiologies of chronic diarrhea.
- Lab. Tests.
- Colonoscopy and biopsy are the tests of choice to diagnose ulcerative colitis.
- Barium enema.

LAB.TESTS

1. stool examinations for ova and parasites and stool culture.
2.CBC.(anemia)
3.Elevated sedimentation rate.
4.elevated C-reactive protein (ie, >100 mcg/L):Both of these findings correlate with disease activity.
5.Hypoalbuminemia (ie, albumin <3.5 g/dL.
6.Hypokalemia (ie, potassium <3.5 mEq/L. Due to diarrhea
7.antineutrophil cytoplasmic antibody (p ANCA), is found more commonly in ulcerative colitis than in Crohn disease.

Radiology :

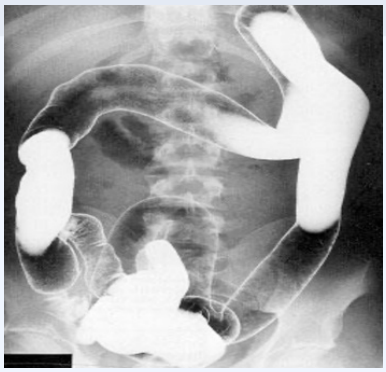
Normal and persistent haustratsion



Pseudopolyps in ulcer colitis

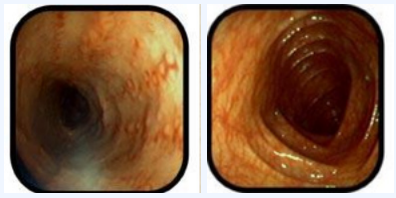
-Loss of hostration , pipe like (due to fibrosis)

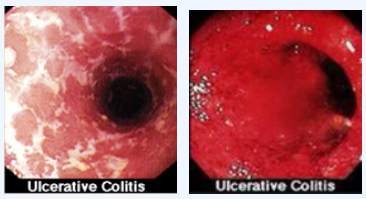
Barium enema :
Pipelike in the left side of colon And early involvement in the Rt. side of colon" saw like appearance"



Barium enema of
Chronic pancolitis "pipelike"

Typical vascular pattern, friability, exudates, ulcerations, and granularity in a continuous, circumferential pattern.





The choice of treatment depends on :

a. Location &severity of the disease.
b. Presence of complications.
c. Patient response to treatment

Medical treatment

Anti inflammatory treatment !

Medical treatment is always the first choice unless emergency surgery is required. The aim of medical treatment is to control flare ups by reducing the inflamation that triger symptoms and reduce the chances of further flare ups & complications.

First-line medical therapies:

- 5-aminosalicylic acid- (mesalamine)

which acts topically from the colonic lumen to suppress the production of numerous proinflammatory mediators.

- Proctitis has been shown to respond better to suppositories than to oral 5-ASA.
- response may take three to four weeks.
- Patients with proctosigmoiditis require delivery of ASA via an enema and may need four to six weeks of therapy to achieve remission.
- Patients unable to tolerate the anal irritation of topical 5-ASA may try oral preparations.
- Patients with pancolitis often require a combination of oral and topical 5-ASA compounds in addition to corticosteroids.
- Patients who fail to improve with the maximal dosage of 5-ASA compounds or who cannot tolerate the side effects.

-Oral steroid therapy should be considered.
Prednisone is given to these patients in dosag
of 40 to 60 mg per day.

Full-dose therapy is continued until symptoms are completely controlled (usually 10 to 14 days)
- The dosage is then tapered gradually by 5 mg per week .

- When patients do not respond to orally administered steroids, they should be admitted to the hospital to receive intravenous corticosteroids, such as methylprednisolone sodium (Solu-Medrol)40 mg daily.

- Hospitalized patients who fail to respond to intravenous corticosteroids after five to seven days are candidates for intravenous cyclosporine (Sandimmune)

COMPLICATIONS

- Toxic colonic dilatation “Fulminating colitis”:

a. The most common cause of death in ulcerative colitis
b. characterized by a thin-walled, large, dilated colon that can eventually become perforated
c.Symptoms & signs include abdominal pain and distension , fever and weakness ,patient become disoriented.

- Plain radiograph :colonic dilatation diameter> 6 cm
- Perforation
- Sever haemorrahge
- Benign stricture may rarely cause intestinal obstruction.
- Colonic adenocarcinoma develops in 3-5% of patients with ulcerative colitis.

The risk increases with the duration of disease.
The risk of colonic malignancy is higher in pancolitis and in cases in which disease occurs before the age of 15 years

CANCER SCREENING

Direct relation between the Duration & involvement of U.C and cancer

- The risk of colon cancer is
  2% in the first 10 years of ulcerative colitis.
  8% during the first 20 years.
  18% during the first 30 years.
- Patients who have only proctitis or proctosigmoiditis are not considered to be at increased risk of developing colon cancer

INDICATION FOR SURGERY

1.Sever cases failing to respond to medical therapy or long-term steroid dependence.
2.Chronic disease with frequent motions anaemia urgency tenesmus or the disease being present for 7-10 years.
3.sever dysplasia, risk of neoplastic changes.
4. Extra intestinal manefestations.
5. Indications for urgent surgery include :
Massive bleeding,perforation, toxic megacolon

SURGICAL PROCEDURES

Surgery can often eliminate ulcerative colitis.
EMERGENCY:
Total colectomy + ileostomy.

We do total colectomy without the rectum and make temporary ileostomy and , after three months (elective surgery) we make proctocolectomy and ileo anal anastomosis

ELECTIVE :
Proctocolectomy + ileo anal anastomosis with ileal pouch

Proctocolectomy (remove rectum)

BAD PROGNOSTIC CRITERIA

1. **Age above 60 years**
2. **The whole colon is involved**
3. **Sever initial attack**