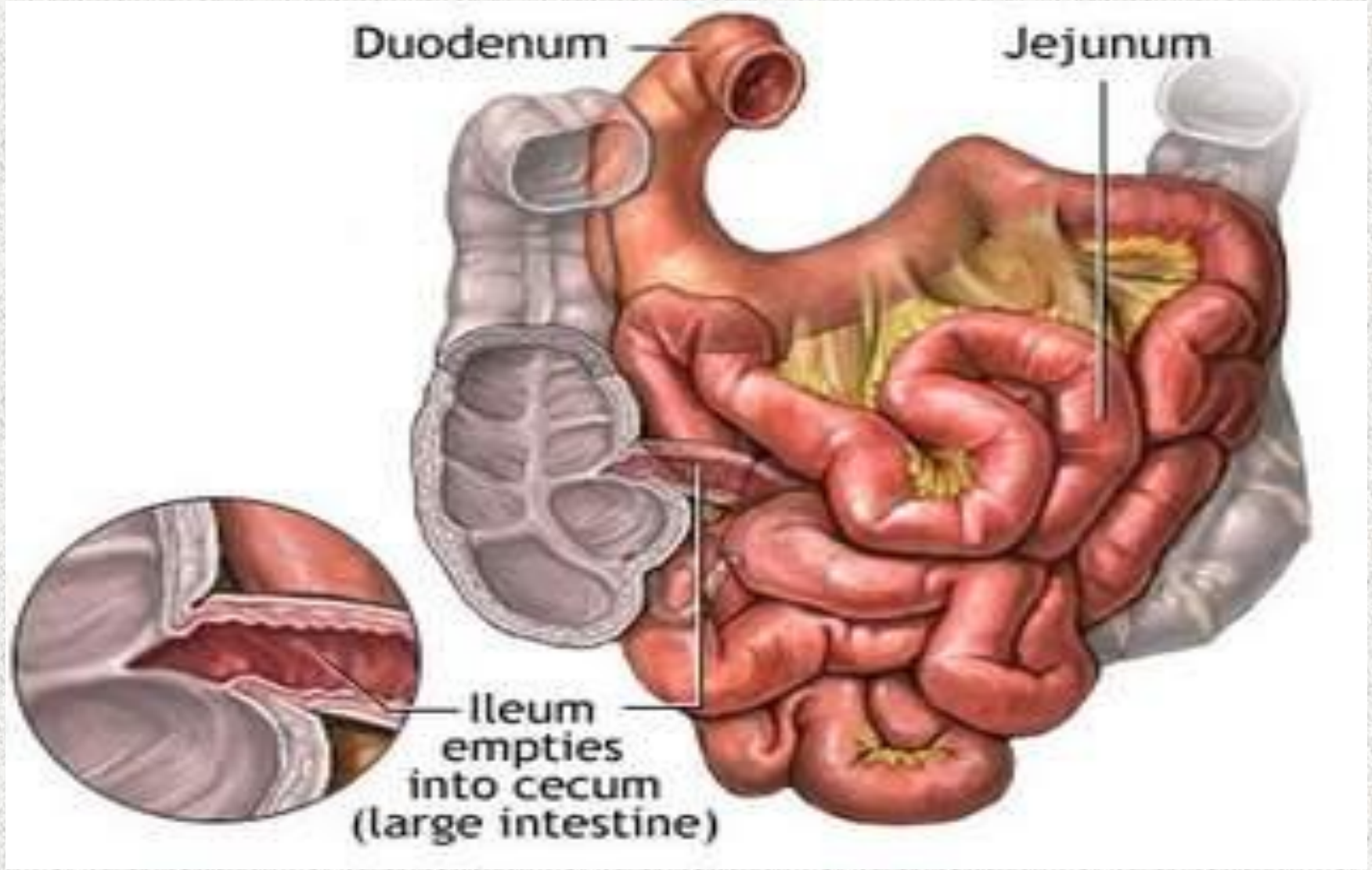
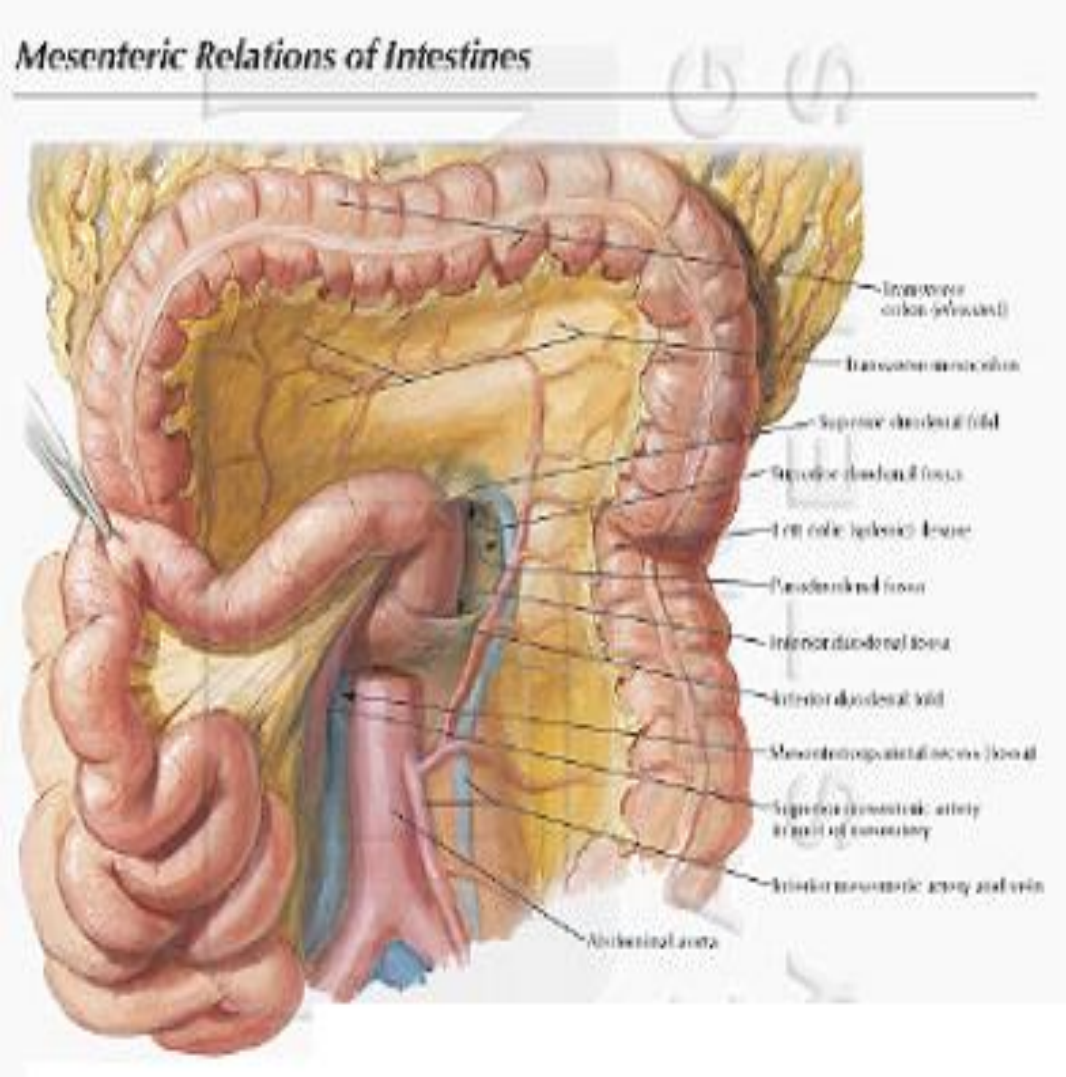
SMALL INTESTINE



SURGICAL ANATOMY

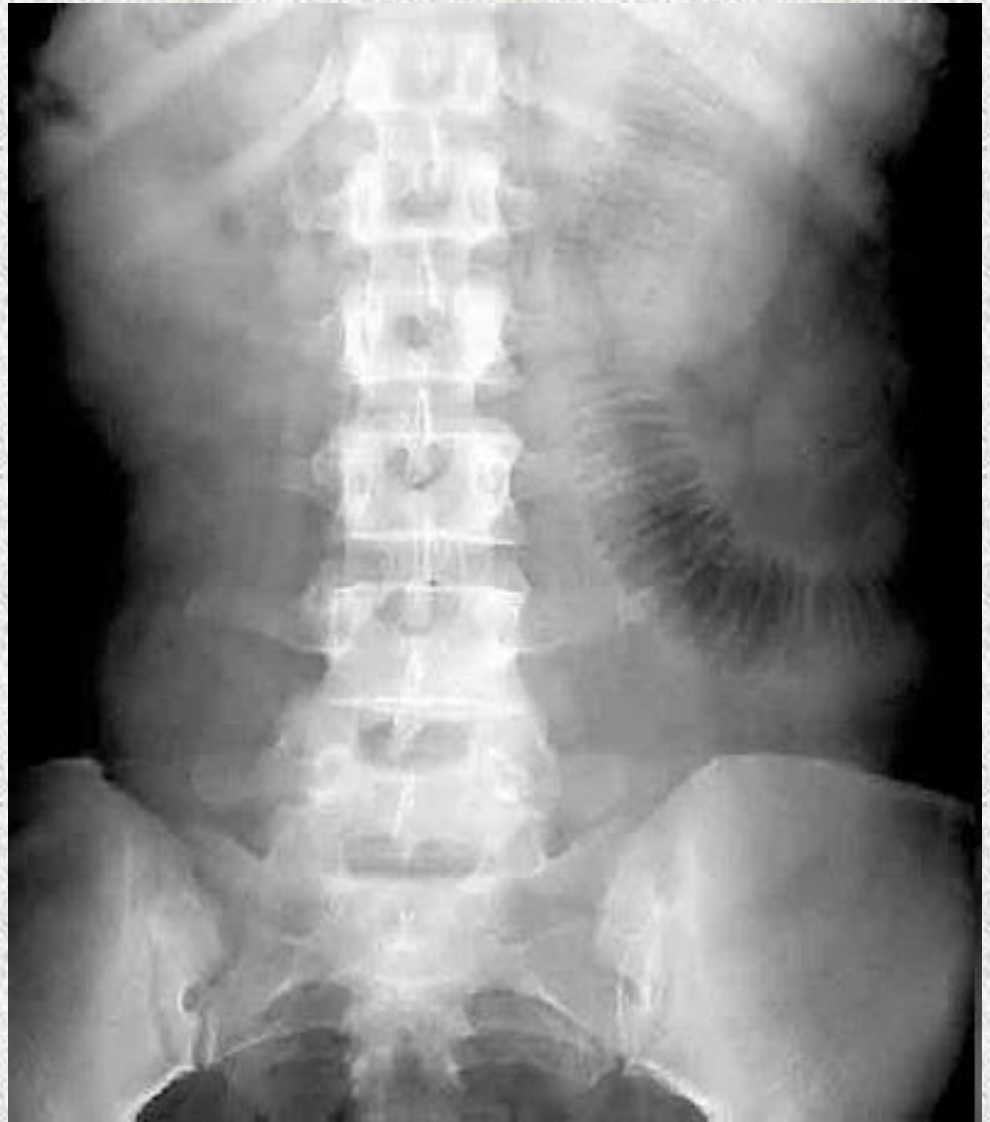


*The duodenum has 4 parts: superior, descending, horizontal, and ascending

* Except for its first part, the duodenum is largely retroperitoneal
it has no mesentery and is covered by peritoneum only on its anterior surface.

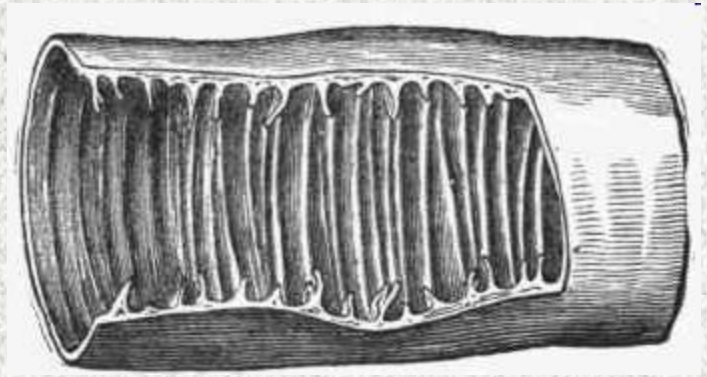
* The B.supply of small intestine by sup. Mesenteric artery

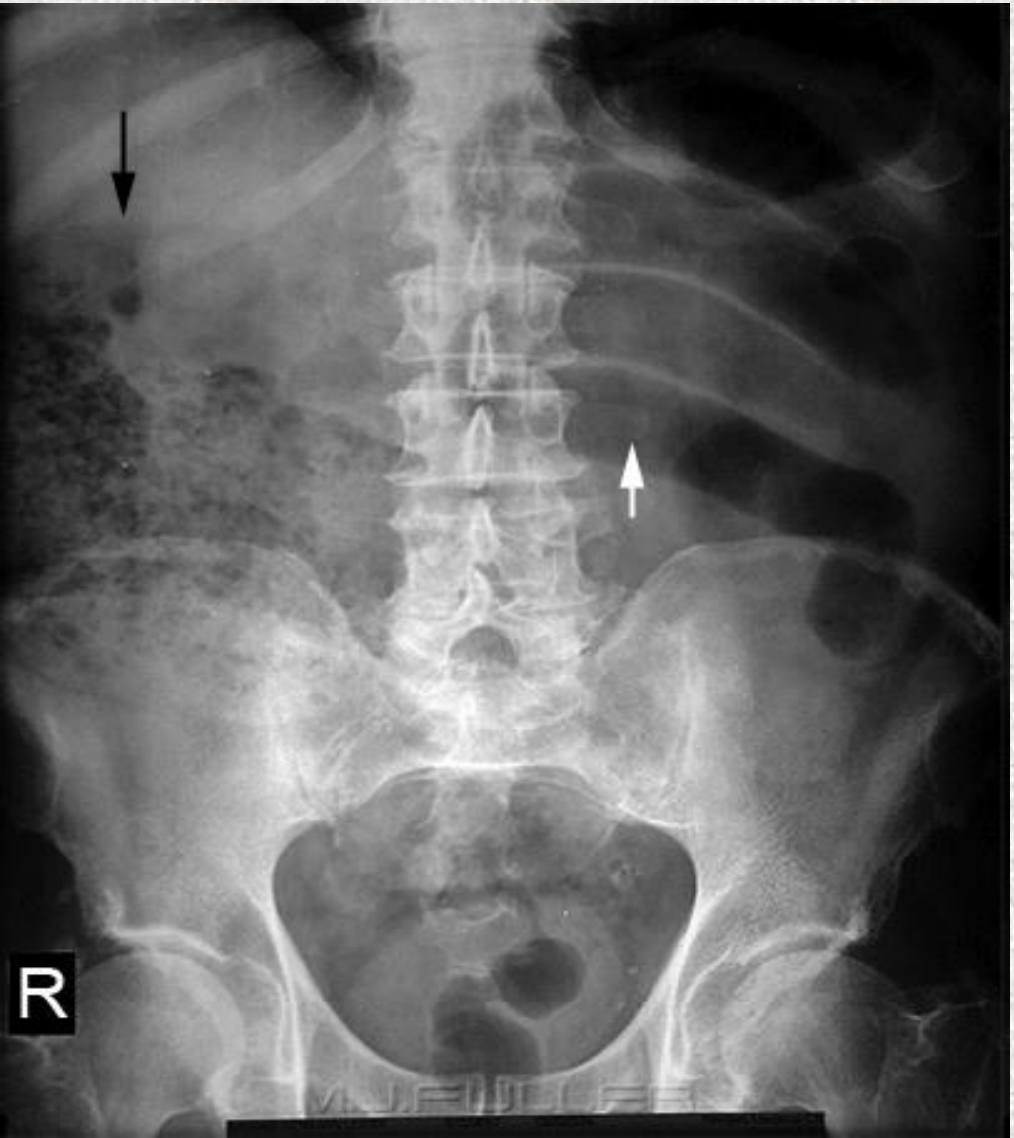
Clinical anatomy



clear demarcation is noted between the ileum and jejunum

The jejunum has a thicker wall and a wider lumen than the ileum and mainly occupies the left upper and central abdomen.





The ileum has a thinner wall and a smaller lumen than the jejunum and mainly occupies the central and right lower abdomen and pelvis.

Investigation of GIT

The small intestine is evaluated radiologically by:

- Plain abdominal Xray
- upper GI series using barium or Gastrografin follow-through.
- enteroclysis, in which contrast is introduced directly into the proximal jejunum thorough a nasojejunal tube.
- CT scanning can also be combined with enteroclysis.
- Capsule endoscopy, video camera that is swallowed by the patient; as it passes through the gastrointestinal tract, it keeps transmitting digital images of the mucosa that are captured by a receiver device strapped to the patient.

DISEASES OF SMALL INTESTINE

1. CONGENITAL
2. INFLAMATORY
3. MECHANICAL CAUSES
4. VASCULAR
5. NEOPLASTIC

Congenital variants

*A patent vitellointestinal duct:

- Meckel diverticulum:.
- Vitelline sinus at the umbilicus
- Fibrous band between ileum and umbilicus, around which torsion of a small bowel loop may occur

* Malrotation of the gut results in the location of the small intestine on the right side and the narrow base of the small bowel mesentery predisposes it to volvulus.

* Atresia (duodenal, jejunal, and ileal), narrowing, or even complete obliteration of the lumen resulting in neonatal intestinal obstruction * Diverticulae and duplication can occur in any part of the small intestine.

CROHNS DISEASE

American gastroenterologist
Burrill Bernard Crohn

* Dr. Burrill B. Crohn, who first described the disease in 1932
  - Crohn's disease may affect as many as 780,000 Americans.
* Men and Women are equally likely to be affected.
* the disease can occur at any age, is more prevalent among adolescents and young adults between the ages of 15 and 35 y.
* The causes of Crohn's disease are not well understood. Diet and stress may aggravate the dis., It tends to run in families.
- recently a gene called NOD2 has been identified as being associated with Crohn's disease and the susceptibility to abnormal activation of the immune system is genetically inherited.

PATHOLOGY

Affect any part of G.I.T.,

comonly :

Distal ileum only 33%

Colon only 20%

Ileum & colon 50%

1. Transmural pathology
2. Skipped areas are characteristic
3. dull purple red loops +areas of thick grey –white exudate
4. Deep mucosal ulcerations+ edema of the mucosa in between – cobble stone appearance
5. Enlarged mesenteric L.N.
6. extensive fat wrapping of intestine
7. dilated proximal segment

CLINICAL FEATURES

The symptoms of Crohn's disease are dependent on the location, the extent, and the severity of the inflammation

1. colicky intermittent pain is the most common symptom of Crohn's disease , becomes constant dull ache as the disease progresses.

2.Diarrhoe,the 2nd most common symptom

3. Hematochezia

4.Low grade fever

5.malaise,wt loss

6.arthralgia

7.tenderness in Rt lower abdomen

8. Non classical anal fissures, recurrent perianal abscesses

Diagnosis of crohns disease

There isn't any single test that can diagnose crohns dis.

* Crohn disease is initially diagnosed on the basis of a combination of clinical, laboratory, radiologic and histologic findings

* A diagnosis of Crohn's disease should be considered in any patient who presents with chronic diarrhea, abdominal pain, bowel obstruction, weight loss, fever, or night sweats

Laboratory study

*Generally they are nonspecific but may be helpful in supporting the diagnosis

Hb, ESR, CRP.

*Serologic studies are sometimes used to facilitate differentiation of Crohn disease from ulcerative colitis

- Antibodies to the yeast saccharomyces cerevisiae

are found more commonly in Crohn disease than in ulcerative colitis,

whereas perinuclear antineutrophil cytoplasmic antibody (p-ANCA), is found more commonly in ulcerative colitis than in Crohn disease

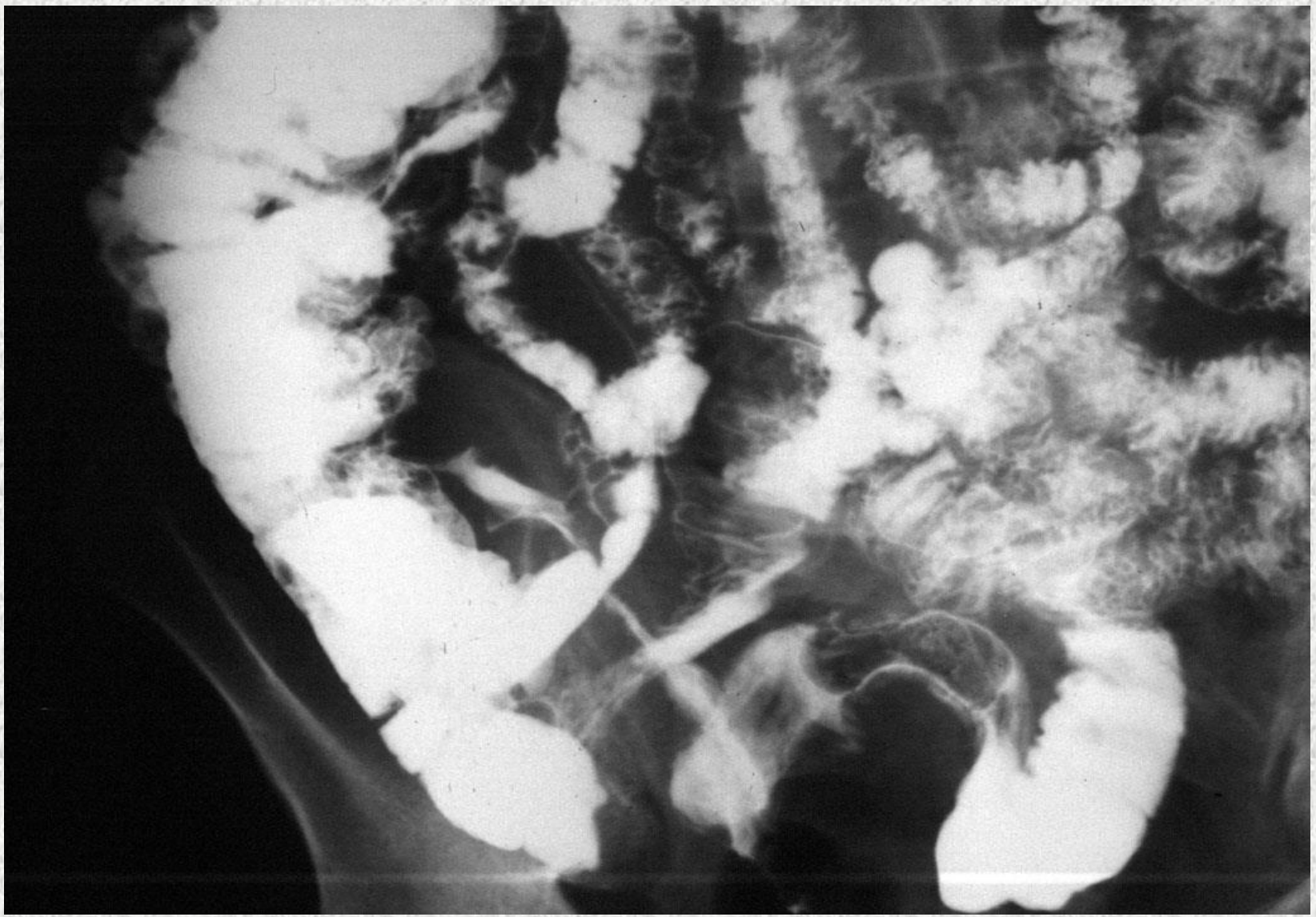
Radiology

Various imaging modalities are available to aid in the diagnosis and management of Crohn disease

1. Plain abdominal X ray
2. Barium meal and follow through
3. C.T. scan
4. U/S

*Endoscopic visualization and biopsy are essential in the diagnosis of Crohn disease

A noncaseating granulomas in about 15-30% of cases of biopsy samples and 40-60% of surgical specimens.



COMPLICATIONS

1. Obstruction
2. Fistula formation:
   - -peritoneum
   - -bowel
   - -Skin
   - -Urinary bladder
3. Haemorrahge
4. localised abscesses
5. malignancy

TREATMENT

There is NO CURE for crohns disease

MEDICAL & SURGICAL therapy are palliative

- to treat the acute flare-ups
- to maintain remission

- the use of medication, designed to suppress the immune abnormal inflammatory response system's

Mild to moderate Crohn's disease

1. Treated with a salicylate preparation which include mesalamine and sulfasalazine

The dosage of oral mesalamine is 3 to 4 g per day

The response to therapy should be evaluated after several weeks.

2. antibiotic therapy :

Moderate to Severe Disease

*Treated with steroids until symptoms resolve and weight loss is reversed.

prednisone 40 mg daily over eight to 12 weeks have been shown to achieve a clinical response

*The immunomodulators azathioprine (Imuran) and mercaptopurine (Purinethol) may be used, but full response may not be achieved for several months.

Recently:

infliximab, an antibody to human tumor necrosis factor used to treat Crohn's disease

, infliximab has proved successful in closure of fistulas, steroid-refractory disease, and in the improvement of moderate to severe disease

Other Considerations in treating crohns disease

vitamins and mineral supplementation

iron,

calcium

folic acid and vit.B12

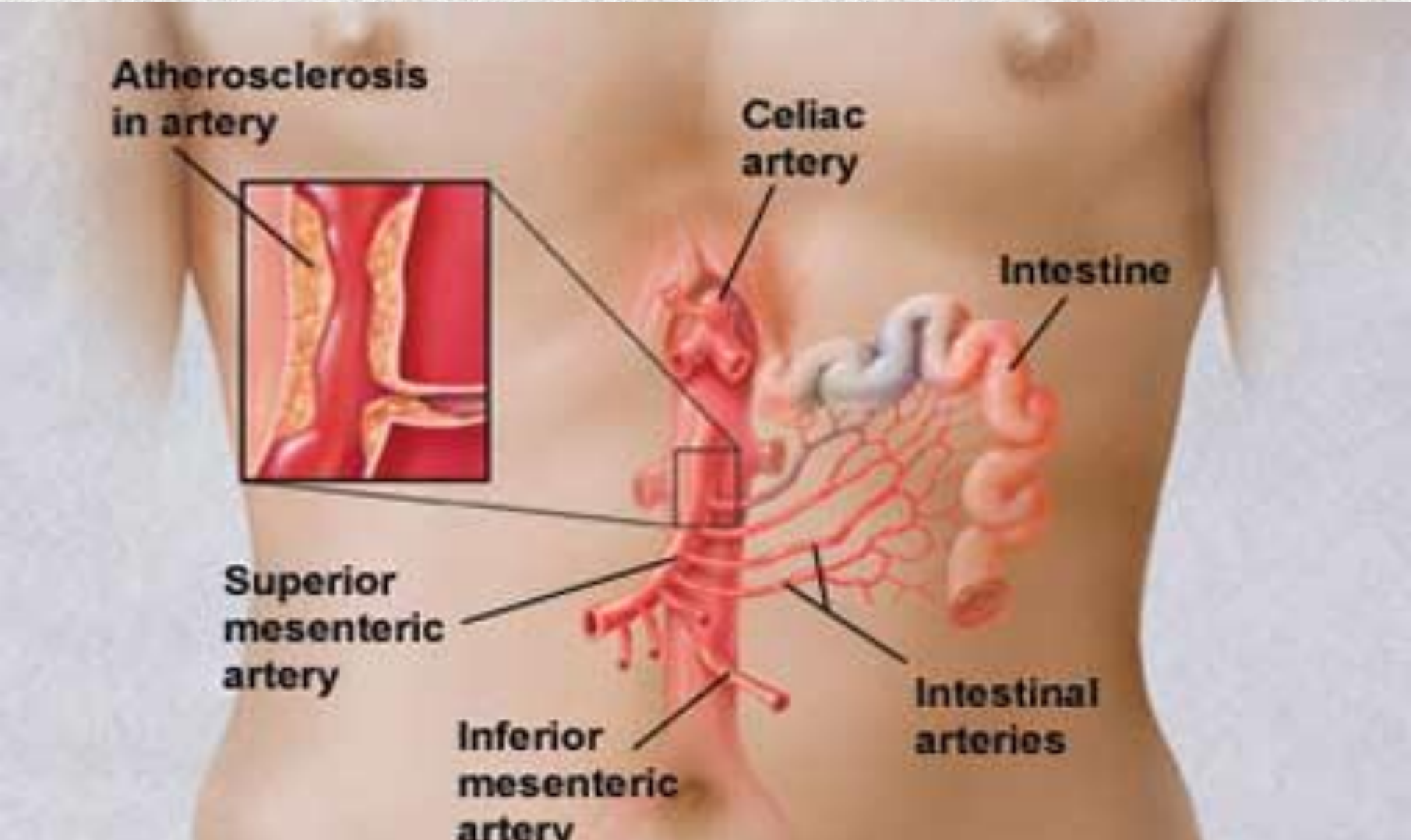
SURGICAL INDICATIONS

1. **Recurrent intestinal obstruction**
2. **bleeding**
3. **Perforation**
4. **Abscess formation**
5. **intestinal fistula**
6. **malignant changes**

The surgical procedure in crohn disease

*Resection of the affected bowel
*Drainage of any septic foci
*Strictureplasty
*Bypass
*Endoscopic dilatation of symptomatic accessible strictures

Acute mesenteric ischemia (AMI)



Acute mesenteric ischemia (AMI)

*Is typically defined as a group of diseases characterized by an interruption of the blood supply to varying portions of the small intestine, leading to ischemia and secondary inflammatory changes. If untreated, this process will eventuate in life threatening intestinal necrosis.

*The incidence is low, estimated at 0.09–0.2% of all acute surgical admissions.

*Embolic phenomena account for approximately 50%

arterial thrombosis for about 25%,

NOMI for roughly 20%,

MVT for fewer than 10%

THE RISK FACTORS FOR ACUTE VISCERAL ISCHEMIA

1. Age greater than 50 years
2. Congestive heart failure,Digitalis therapy
3. Recent transmural myocardial infarction
4. Cardiac dys arrythmias especially atrial fibrillation
5. Hypercoagulable state
6. Hypovolaemia with hypoperfusion.

PATHOLOGY

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Damage to the affected bowel portion may range from reversible .ischemia to transmural infarction with necrosis and perforation

1.The early changes ,alteration in capilary permeability.

2.Mucosal sloughing may cause bleeding into the gastrointestinal tract2

3. As the ischemia persists, the mucosal barrier becomes disrupted, and bacteria, toxins, and vasoactive substances are released into the systemic Circulation

4. the bowel wall becomes edematous and cyanotic. Fluid is released I nto the peritoneal cavity

5.Transmural necrosis

CLINICAL FEATURES

Symptoms are nonspecific initially,

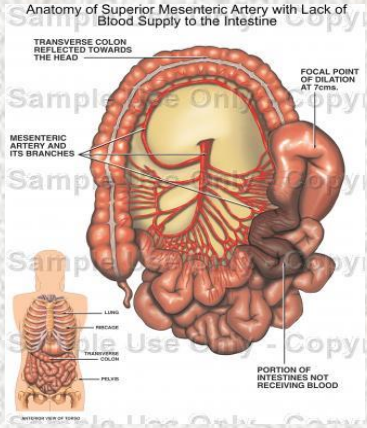
1.Medical history may be significant for presence of stroke, MI, or peripheral artery disease

2.Patients may present with a long history of weight loss, postprandial pain, and phagophobia .

3.abdominal pain :severe, acute, unrelenting abdominal pain

4.vomiting

5.frank blood in the stools.



Signs :

On abdominal examination ,the findings may be minimal.

> if signs of peritonitis present, consider bowel perforation

DIAGNOSIS

1. Clinical features: the high index of suspicion
2. Leucocytosis : >15000
3. ECG
4. Moderatly Elevated serum amylase
5. Metabolic acidaemia
6. A doppler ultrasound,
7. CT scan, CT angiogram.
8. Angiography, selective S.M.A.

On plain films Late findings include

> intramural air

> air in the portal venous system.

If bowel perforation occurs:

> free air in the abdomen may be observed

CT scan findings with a specificity greater than 95% include :

> SMA or SMV thrombosis,
> intestinal pneumatosis,
> portal venous gas,

Treatment of Acute Mesenteric Ischemia

*Treatment options depend on the etiology of intestinal ischemia, as well as on the hemodynamic stability of the patient

Generally speaking, nonocclusive AMI is treated medically, whereas occlusive AMI is correctable with surgery

1. Angiographic: Vasodilators or thrombolysis
2. Surgical: Embolectomy, revascularization, with or without bowel resection
3. Long-term anticoagulation or antiplatelet therapy
4. A “second look” laparotomy may be needed to reassess the viability of questionable areas of bowel

SMALL INTESTINAL TUMOUR

Despite comprising 75% of the length and 90% of the surface area of the GI tract,

the small bowel harbors relatively few primary neoplasms

account 5% of all G.I. NEOPLASM

and fewer than 2% of GI malignancies.

Factors suggested to explain the scarcity of small bowel lesions and the infrequency of their malignant transformatio:

* Rapid Transit of contents fluidity
* High turn over rate of epith. Cells
* Alkalinity of small intestinal Media.
* High level of IGA.
* High level of benzyl peroxidase"detoxify potential carcinogene"

BENIGN TUMOURS

- **adenoma,**
- **liomyoma**
- **lipoma**
- **fibromas**
- **fibromyxomas**
- **neurofibromas**
- **ganglioneuromas**
- **hemangiomas**

CLINICAL FEATURES:

1. they invariably present difficult problems in diagnosis
2. Symptoms are often absent until the tumor has progressed to produce a complication. “ delayed complications”
3. Even then, the presentation is often vague and nonspecific, intermittent pain, chronic anemia
4. May present as one of the possible complications:
   - intestinal obstruction
   - intussusception
   - bleeding

Malignant small bowel tumors

1.adenocarcinoma,

2.sarcoma including gastrointestinal strumal tumor

3.carcinoid tumors,

4.lymphoma.

Adenocarcinoma is the most common type of small bowel cancer..

Risk factors for small intestine cancer

- Crohn's disease
- celiac disease
- Having inherited syndromes-
-Examples : Lynch syndrome, familial adenomatous polyposis (FAP)

Symptoms of small bowel malignant tumour

- Abdominal pain/cramping
- Unexplained weight loss
- Nausea/vomiting
- Blood in the stool
- Watery diarrhea
- Skin flushing
- A lump in the abdomen,abdominal distension, peritoneal signs of complication,

Imaging Studies

1. **Plain abdominal x ray** films may reveal partial or complete small-bowel obstruction.

2. **Upper GI series** with small-bowel followthrough show abnormalities in 53-83% of patients with small-bowel cancer.

3. **Abdominal CT scan** may elucidate the site and extent of local disease and the presence of liver metastases

MRI

Endoscopy

Endoscopic ultrasound

Treatment

Depend on the stage of small bowel cancer

and how far it has spread

Most likely a combination treatment of surgery, radiation, and chemotherapy will be used.