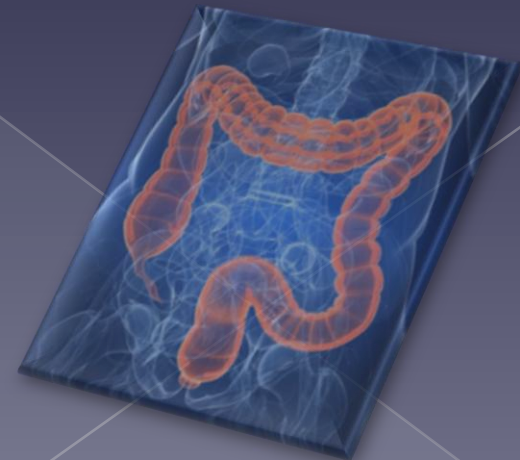


Recent Aspects in diagnosis of Inflammatory Bowel Disease

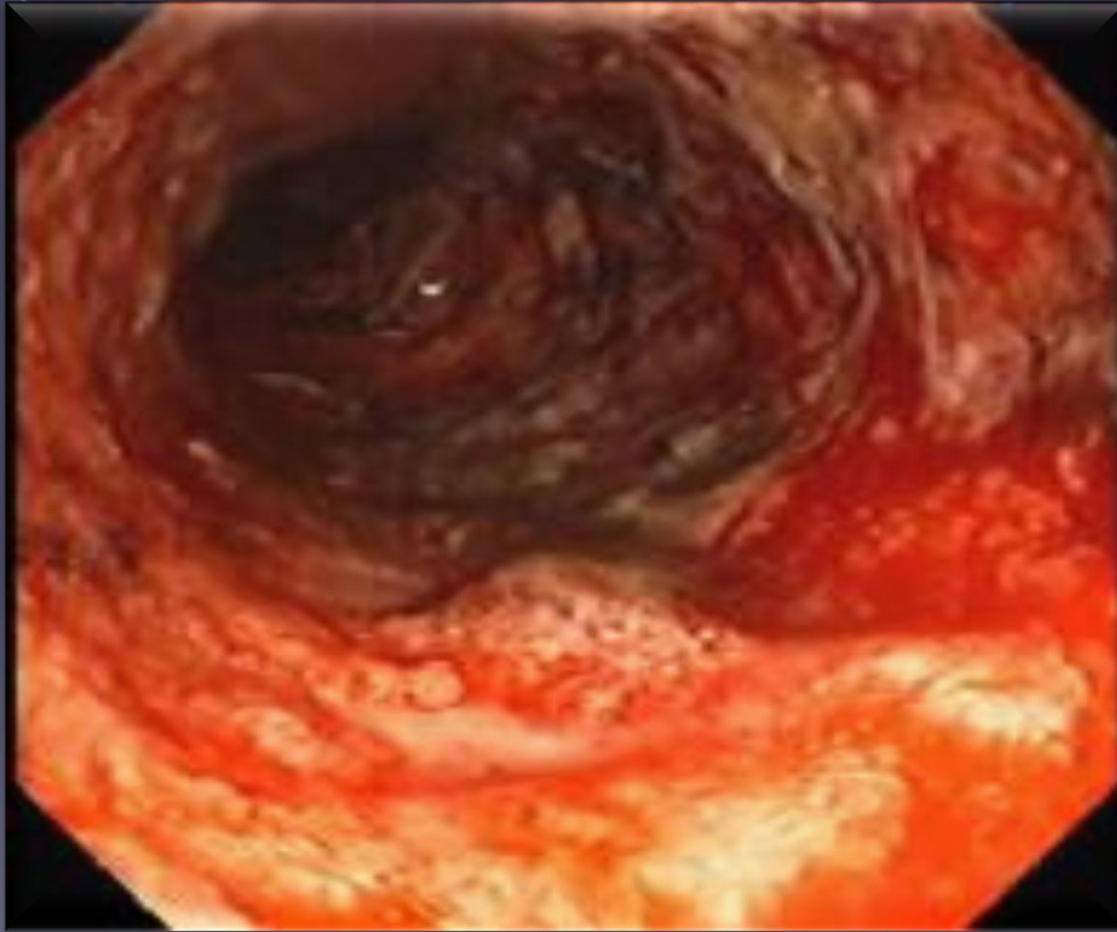
Dr. Maha Maher
Professor of Internal Medicine
Gastroenterology & Hepatology Unit



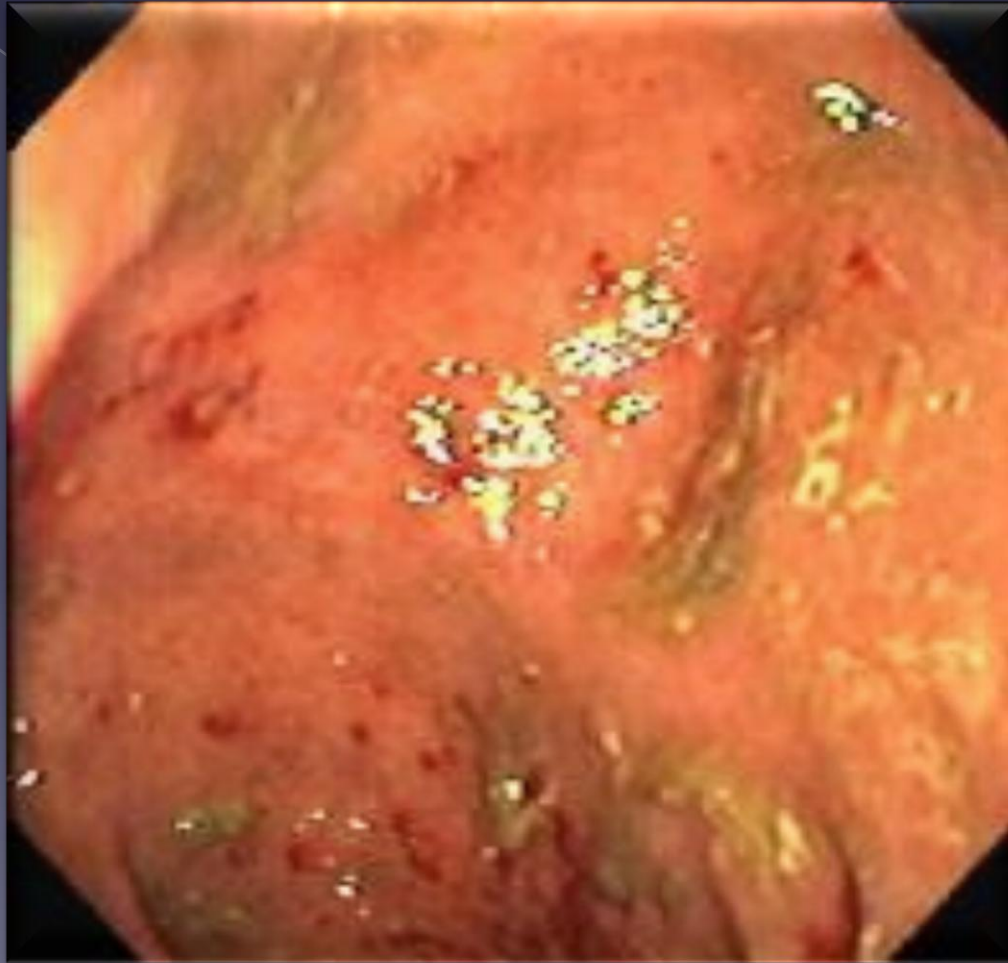
- Inflammatory bowel disease (IBD) is an idiopathic disease, probably involving an immune reaction of the body to its own intestinal tract.
- The 2 major types of IBD are ulcerative colitis (UC) and Crohn disease (CD).



Ulcerative Colitis



Crohn Disease



International statistics

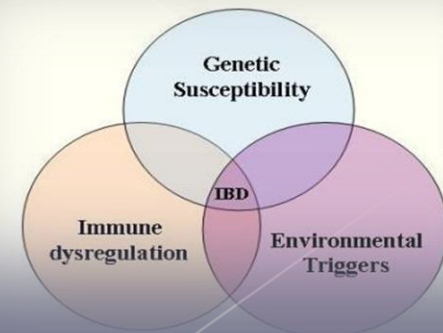


- Incidence of IBD varies, highest rates in developed countries and lowest in developing regions.
- Colder climate and urban areas have a greater rate than warmer climates and rural areas.
- Internationally, incidence of IBD is approximately 2.2-14.3 cases per 100,000 person-years for UC and 3.1-14.6 cases per 100,000 person-years for CD. Overall, the combined incidence for IBD is 10 cases per 100,000 annually

Pathophysiology

The pathophysiology of IBD is under active investigation. The common end pathway is inflammation of the mucosal lining of the intestinal tract, causing ulceration, edema, bleeding, and fluid and electrolyte loss.

IBD: Interaction of Genetic Susceptibility, Immune Dysregulation and Environmental Triggers



Environment
(smoking, stress,
diet, ...)

Genetic susceptibility
(NOD2, ...)

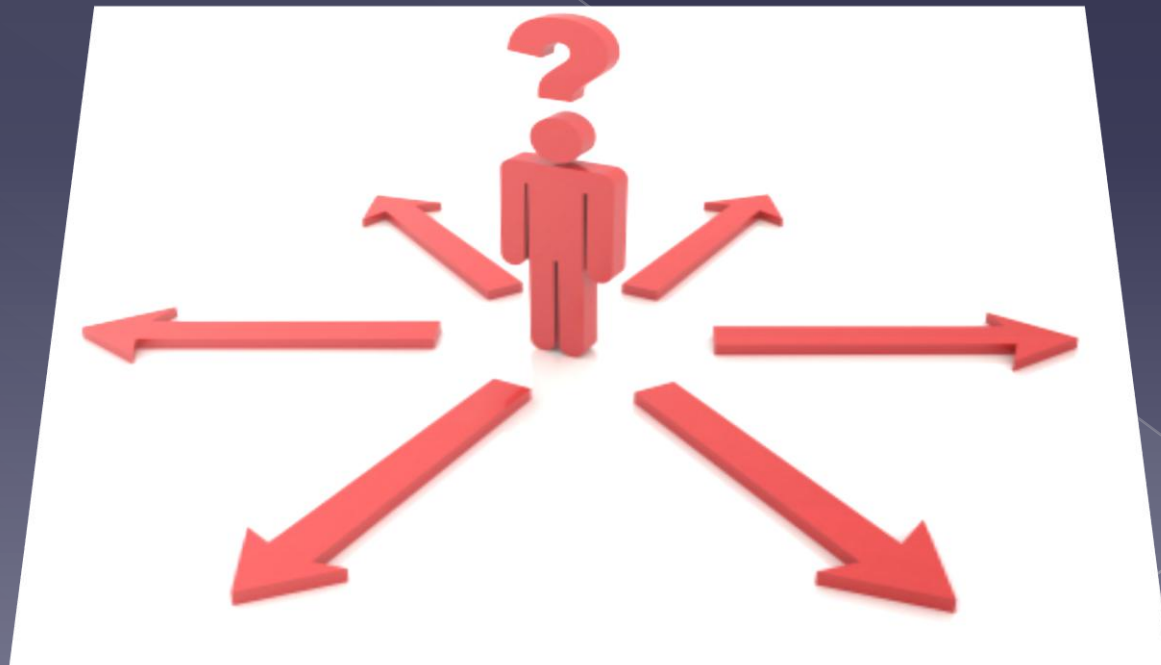
IBD

**Immunological
factors**

Prognosis

- Ulcerative colitis and Crohn disease have approximately equal mortality rates.
- The vast majority of studies indicate a small but significant increase in mortality associated with IBD.
- The most frequent cause of death in persons with IBD is the primary disease, followed by malignancy, thromboembolic disease, peritonitis with sepsis, and complications of surgery.

Diagnostic Approach



Stool Studies

- Stool Culture for bacterial pathogens, and *Clostridium difficile*.
- Pseudomembranous colitis is commonly superimposed on ulcerative colitis.
- 50-80% of cases of acute terminal ileitis are due to *Yersinia enterocolitis* infections. This produces a picture of pseudoappendicitis.
- Yersiniosis also has a high frequency of secondary manifestations, such as erythema nodosum and monoarticular arthritis, similar to IBD.

Complete Blood Cell Count

- An elevated WBC is common in patients with active inflammatory disease and does not necessarily indicate infection.
- Anemia may result from acute or chronic blood loss or malabsorption (iron, folate, and vitamin B-12) or may reflect chronic disease state.
- MCV can be elevated in patients taking azathioprine (Imuran) or 6-mercaptopurine (6-MP).
- Generally, the platelet count is normal, or it may be mildly to moderately elevated if active inflammation is occurring.

Erythrocyte Sedimentation Rate

- (ESR) is used as a surrogate marker for inflammation; an elevation above normal generally indicates the presence of an inflammatory response.
- The sedimentation rate is typically elevated and for most, but not all, patients has been used to monitor disease activity.

C reactive protein

- Has a significantly shorter half-life and thus rapidly decreases in response to a reduction in disease activity

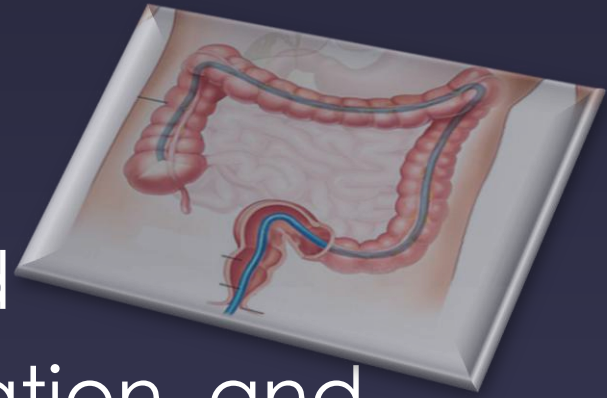
Colonoscopy



- Colonoscopy can determine extent and severity of colitis, assist in guiding treatment, and provide tissue to assist in the diagnosis.
- In skilled hands, colonoscope can frequently reach terminal ileum and assist in the diagnosis or exclusion of Crohn disease.
- Inflammation may occasionally occur in the terminal ileum in patients with ulcerative colitis; this is referred to as a backwash ileitis.

.

Risk of bleeding is increased in the presence of inflammation, and even mucosal biopsies may require cautery to limit bleeding.



The risk of perforation is also increased, particularly in patients taking high doses of steroids long term.

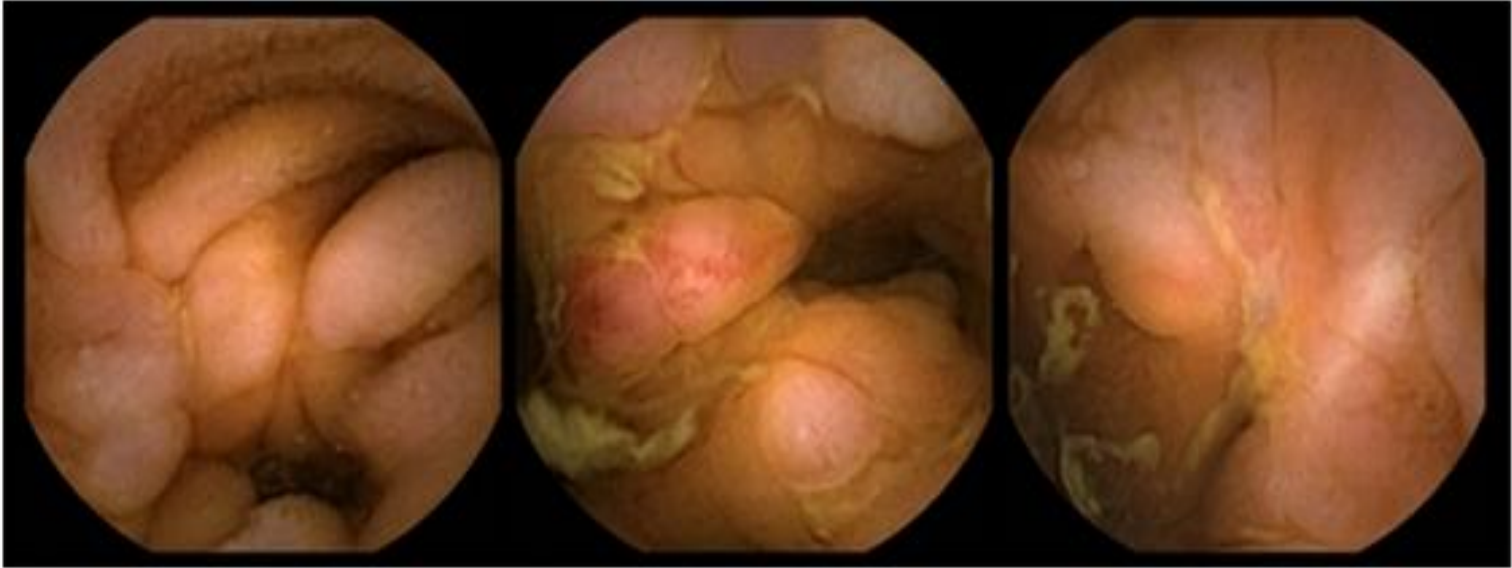
Upper Endoscopy

- (EGD) for evaluation of upper GI tract, particularly in patients with Crohn disease.
- Aphthous ulceration occurs in stomach and duodenum in 5-10% of patients with CD.
- Patients with IBD have higher complication rates than general population; informed consent obtained for endoscopy should mention bleeding and perforation as potential complications .

Capsule Enteroscopy



- The major risk of this examination in patients with Crohn disease is the potential for the camera to become lodged at the point of a stricture, which could require operative intervention for removal.



Crohn's disease of the small bowel in capsule endoscopy:
multiple small ulcerations all over the ileum and jejunum,
scarring alterations of the small bowel.

Inflammatory polyp



Ileitis



Crohn's disease



Linear Erosions



Double-balloon endoscopy

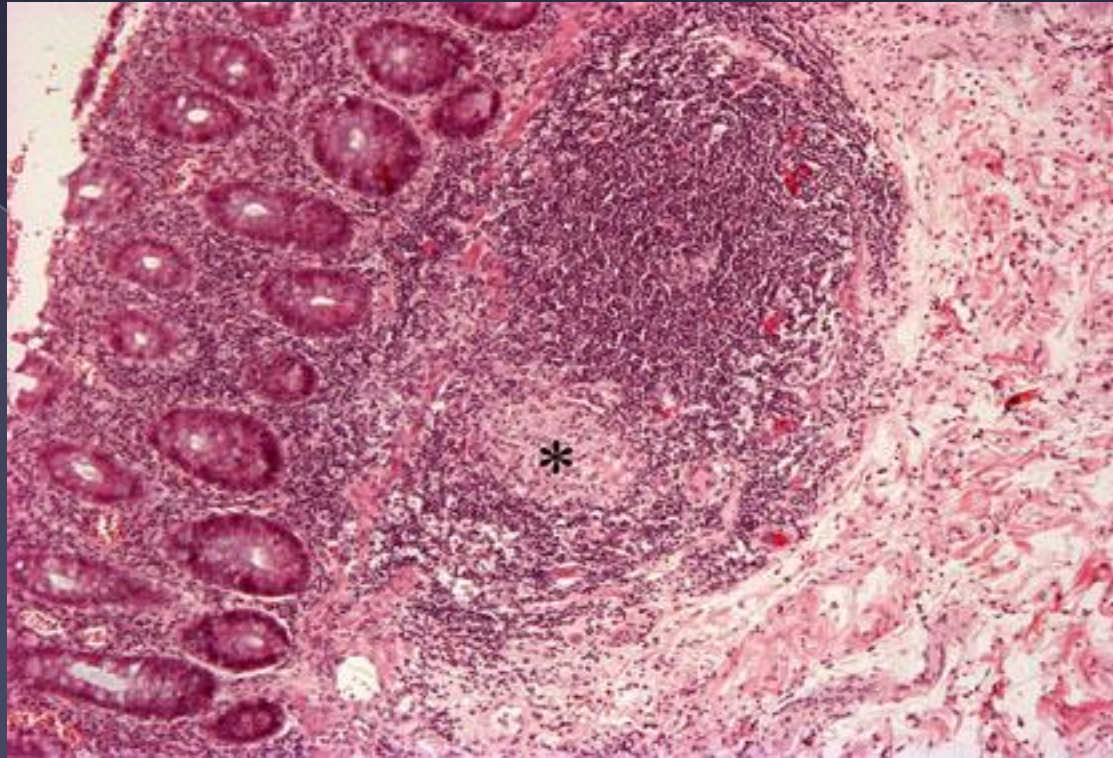


Tight jejunal inflammatory stenosis with deep ulcers and inflammatory polyps

Histologic Findings

- UC involves the mucosa and the submucosa, with formation of **crypt abscesses** and mucosal ulceration. The mucosa typically appears granular and friable.
- In more severe cases, **pseudopolyps** form, consisting of areas of hyperplastic growth with swollen mucosa surrounded by inflamed mucosa with shallow ulcers.
- In severe UC, inflammation and necrosis can **extend below the lamina propria** to involve the submucosa and the circular and longitudinal muscles, although this is very unusual.

CD



There is seen plenty of mononuclear inflammatory cells in the mucosa of large intestine. In addition, round granulomas (*) in the mucosa are visible.

Serologic Test

- **pANCA and ASCA**

Perinuclear antineutrophil cytoplasmic antibodies (pANCA) ----- UC

anti-*Saccharomyces cerevisiae* antibodies (ASCA) ----- Crohn disease.

Patients with IBD who are seronegative appear to have a lower incidence of resistant disease.

Currently, these markers are not sensitive enough to be used as screening tests for IBD, and a diagnosis on the basis of serologic markers alone is inappropriate

◎ **Omp C**

- > IgG only
- > Recognize outer membrane porin C protein in *E. coli*

◎ **I2**

- > IgA only
- > Recognizes novel homologue of bacterial transcription-factor families from a *Pseudomonas fluorescens*-associated sequence

◎ **Cbir 1 flagellin**

- > IgG

Fecal Calprotectin

calprotectin has potential as a screening procedure to differentiate between patients with IBS from other organic intestinal disease

Why Use Serological Markers in Clinical Practice?

- Differentiate IBD from functional bowel disorders
- Accurately diagnose Crohn's or UC in a patient with:
 - > Severe colitis
 - > Indeterminate colitis
- Predict disease course or complications in IBD
 - > CD phenotype
 - > Severity of disease
 - > Risk of pouchitis

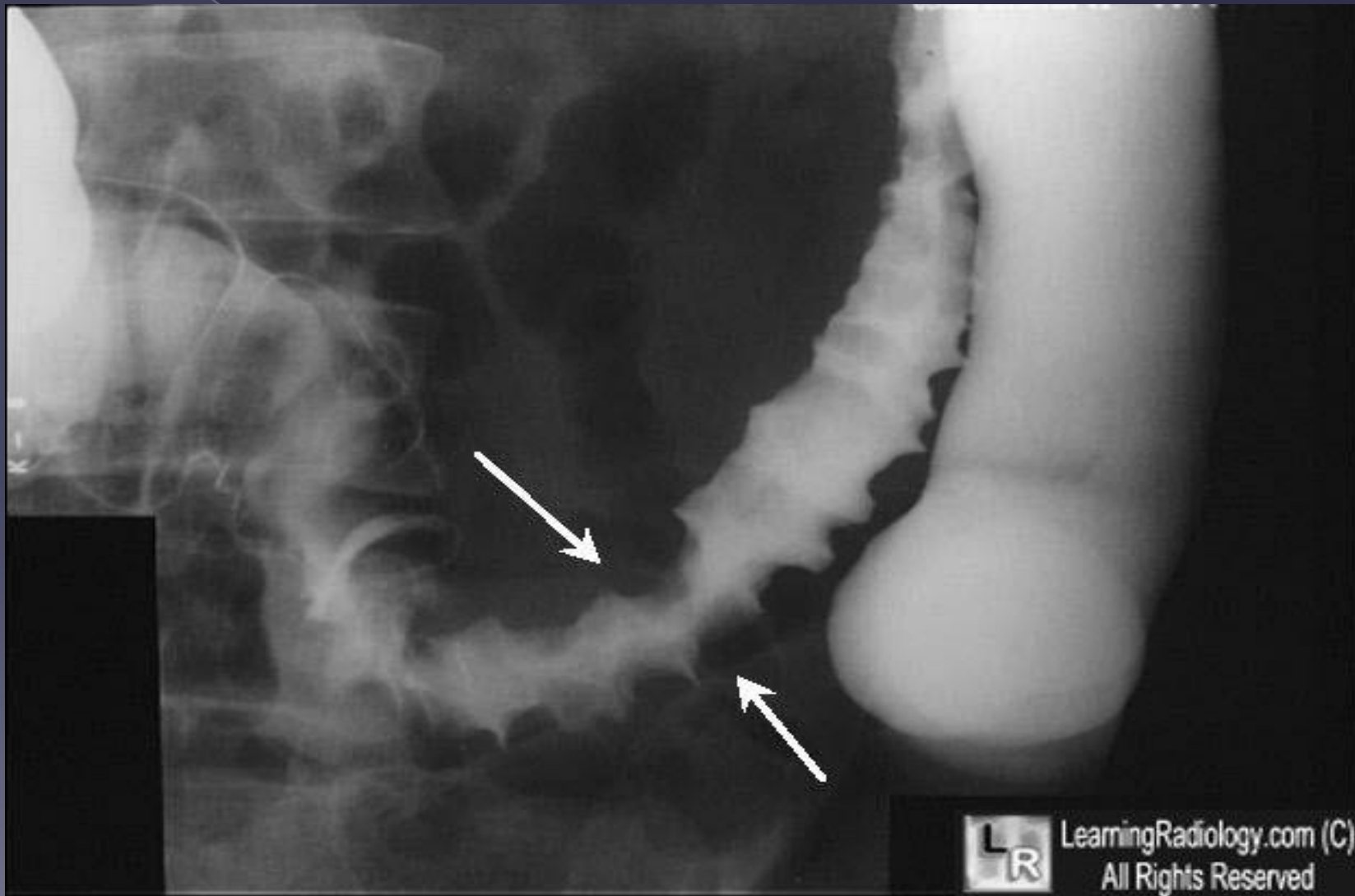
Radiological Investigations



Upright Chest Radiography and Abdominal Series

- Edematous, irregular colon with "thumb printing." Occasionally, pneumatosis coli (air in the colonic wall) may be present.
- Toxic megacolon

Thumbprint



Toxic megacolon



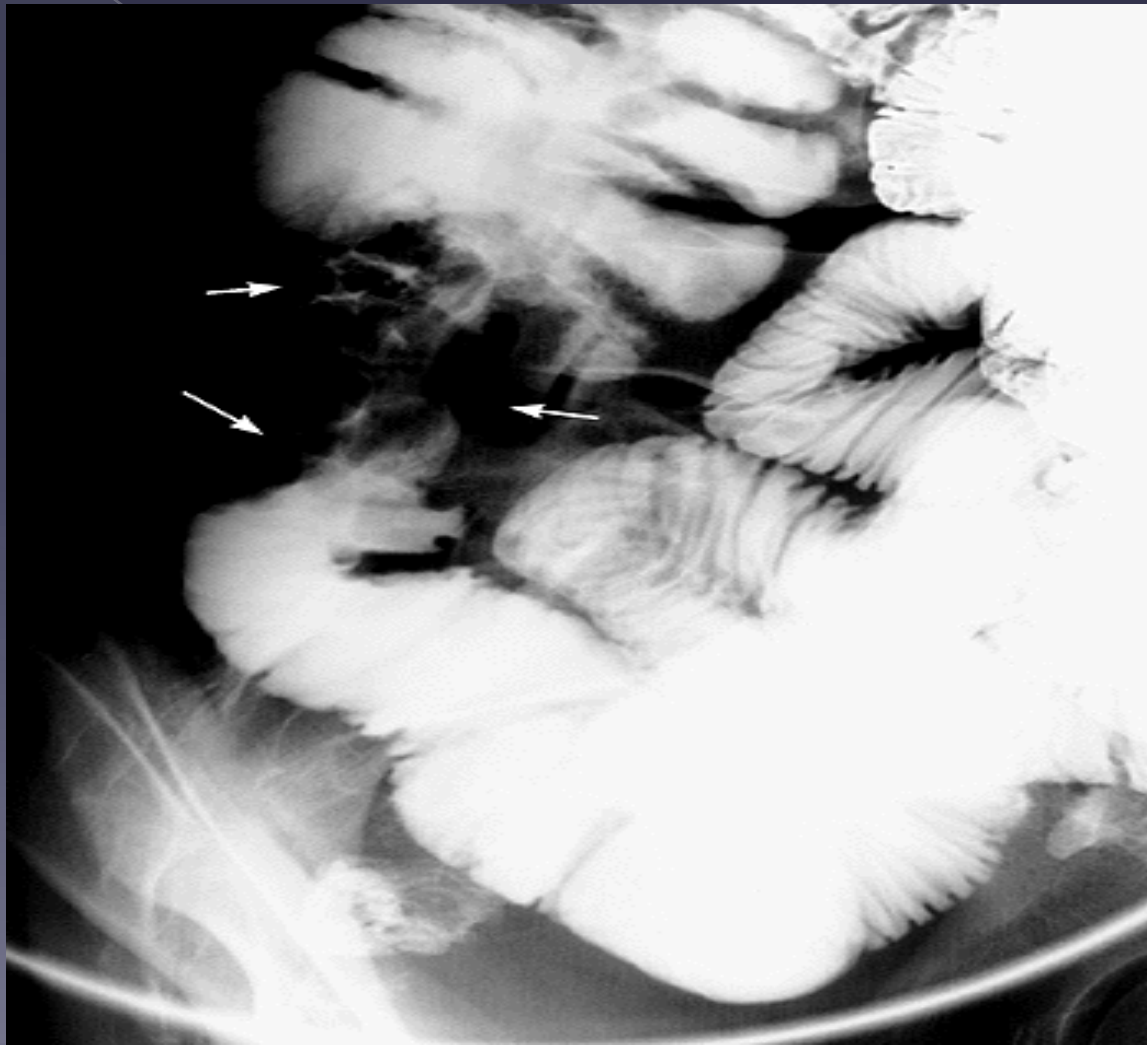
Barium Enema

- Normal barium enema findings exclude active UC, whereas abnormal findings can be diagnostic.
- A lead-pipe appearance, suggests UC
- Rectal sparing, suggests Crohn colitis in the presence of inflammatory changes in other portions of the colon
- Thumbprinting, indicates mucosal inflammation
- Skip lesions, again suggesting Crohn colitis
- Barium enema is contraindicated in patients with moderate to severe colitis, because it risks perforation or precipitation of a toxic megacolon.

Upper Gastrointestinal Tract Study

- The small bowel series is usually sufficient for the evaluation of small intestine Crohn disease; however, rarely, it can afford an inadequate view of the terminal ileum, necessitating an enteroclysis

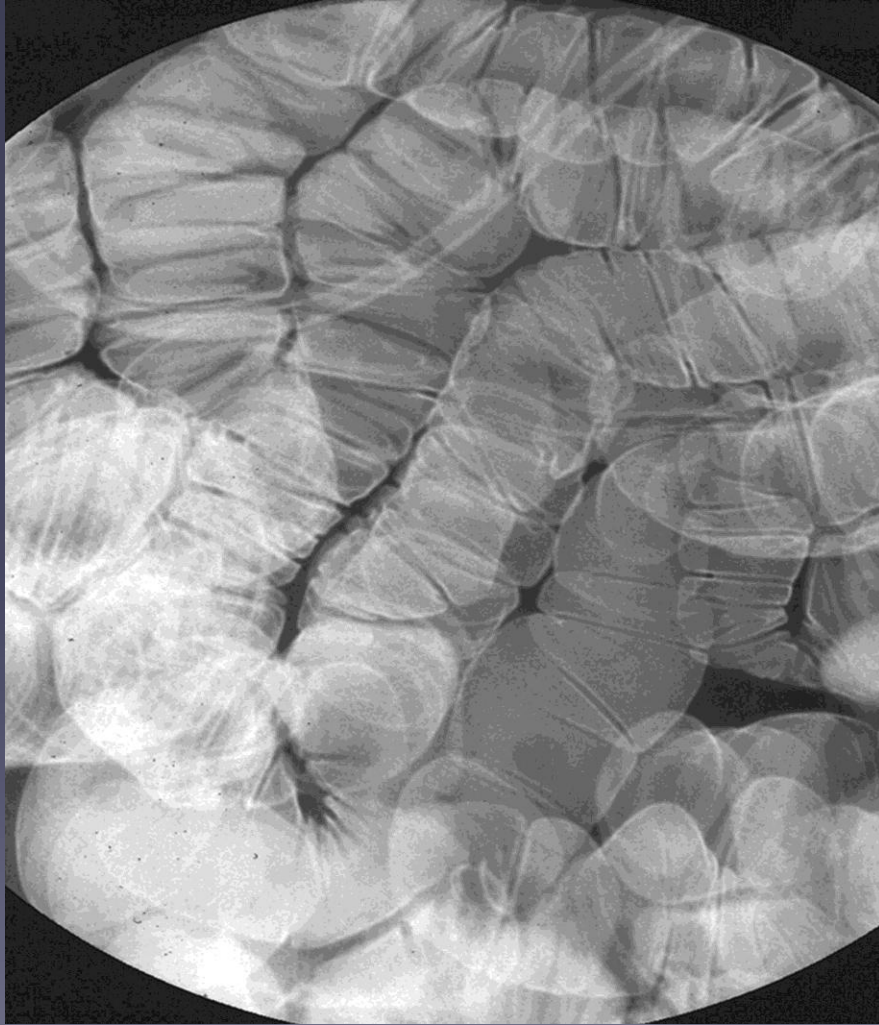
Crohn's Disease



Small Bowel Enteroclysis

- The enteroclysis differs from a small bowel series in that a nasoenteric tube is placed and contrast material is instilled directly into small intestine.
- Usually performed when fine detail of the intestinal mucosa is required or the distal small intestine is not adequately seen on the small bowel series .

Crohn Disease Enteroclysis



Computed Tomography Scanning

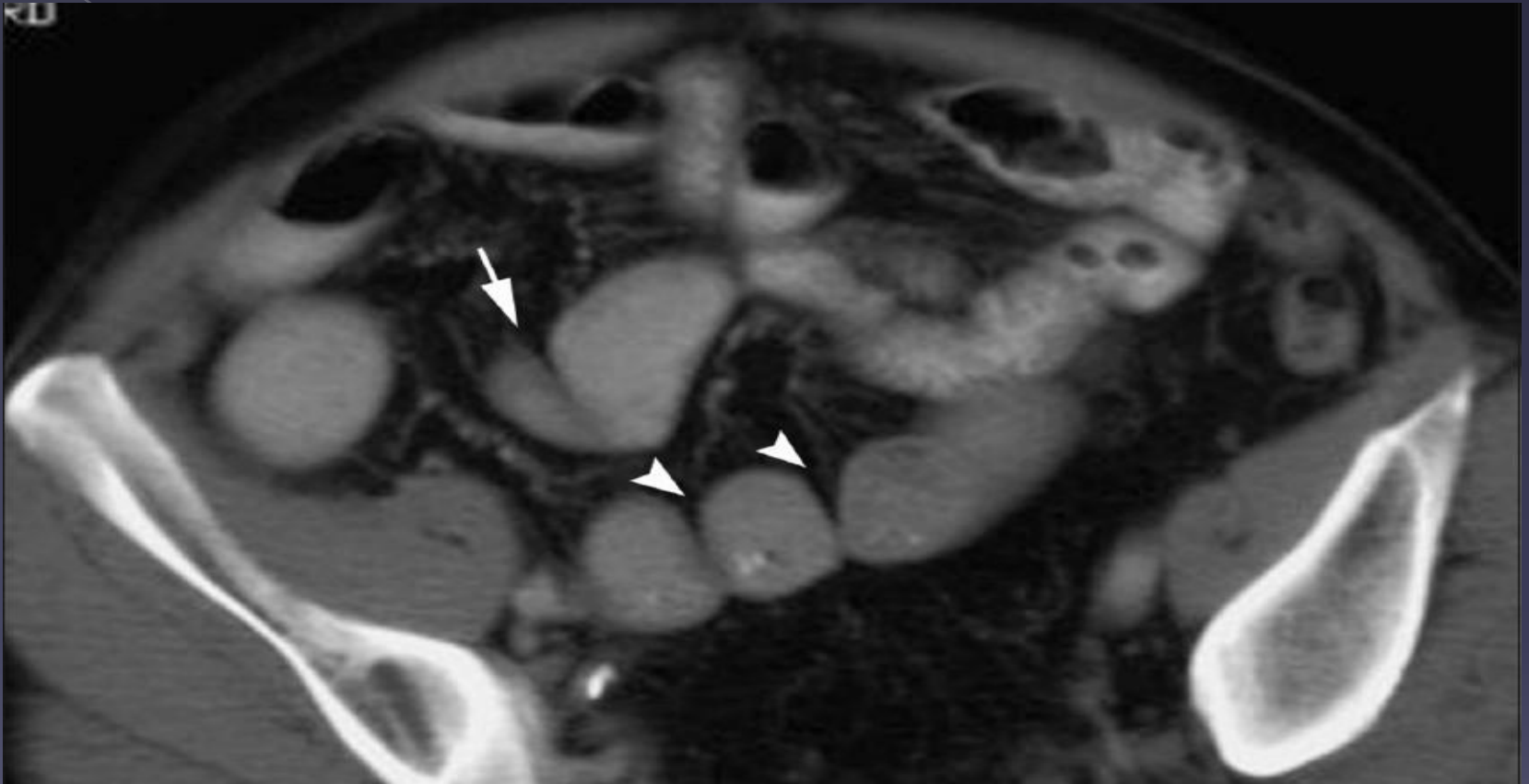
- > Widely used to evaluate for abscess
- > Mesenteric fatty proliferation
- > May show strictures but wall thickening difficult to assess due to variable distension
- > not as sensitive in delineating fissure or fistula as barium studies
- > superior to barium in showing the extraluminal sequelae of Crohns

Newer Techniques

● CT Enteroclysis

- > High volume positive contrast infused rapidly via tube
- > improves small bowel distension – sensitive for small lesions
- > Time consuming procedure to pass Enteroclysis tube
- > Need to use Fluoro room & CT scanner
- > Unpopular with patients (and radiologists !)

CT Enteroclysis



- Axial CT enteroclysis examination demonstrates a segment of kinked bowel (arrowhead) and several adhesive bands across other segments (arrows). This patient had undergone several negative CT examinations previously

Newer Techniques

◎ CT Enterography

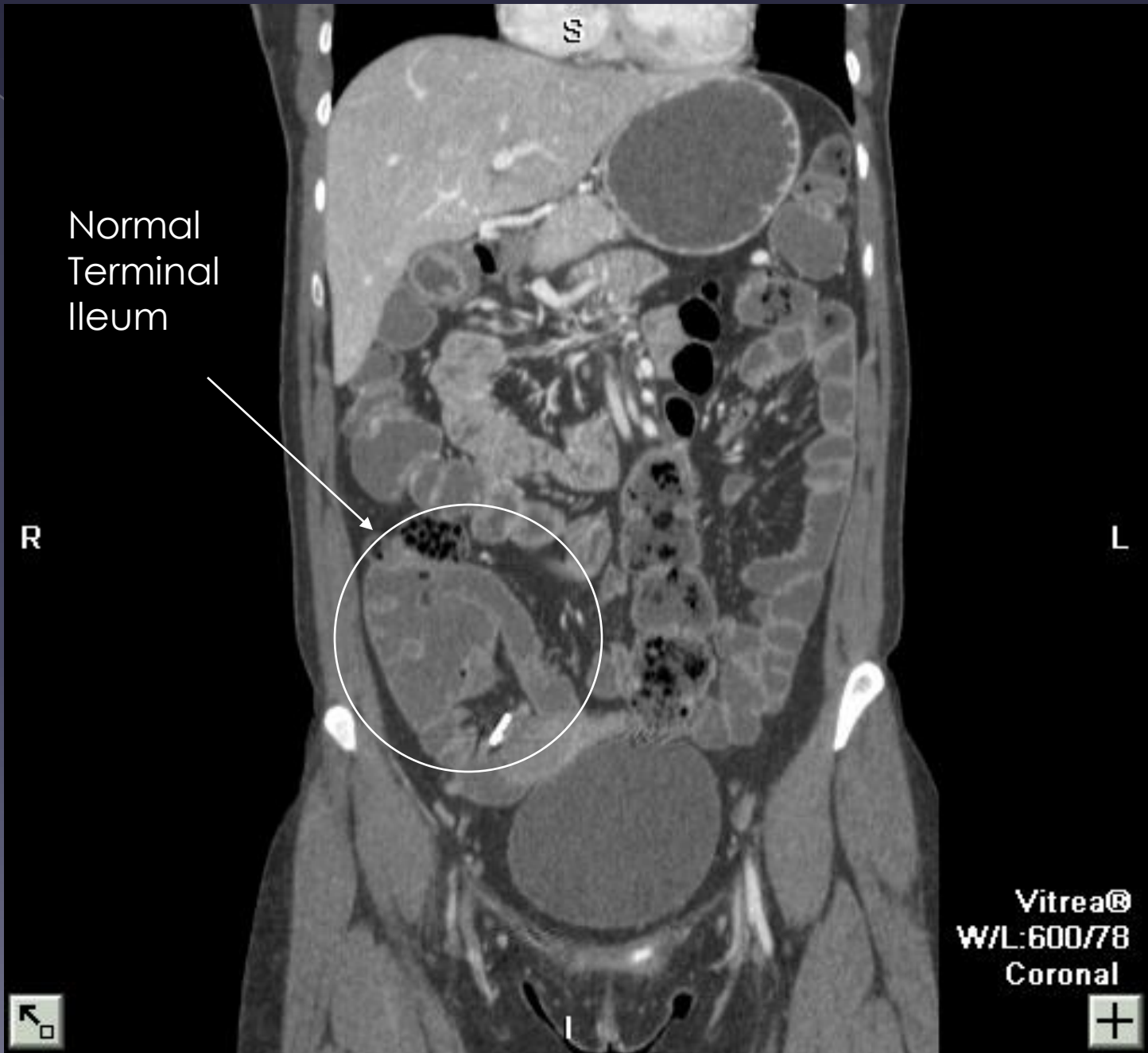
- > High volume (1200ml) negative oral contrast (VoLumen) over 1 hour
- > improves small bowel distension c/w regular CT or SIFT
- > Give IV contrast to evaluate bowel wall
- > Use thin section multislice CT cuts to generate 3D coronal and sagittal views also
- > Well tolerated by patients, no need for jejunal tube

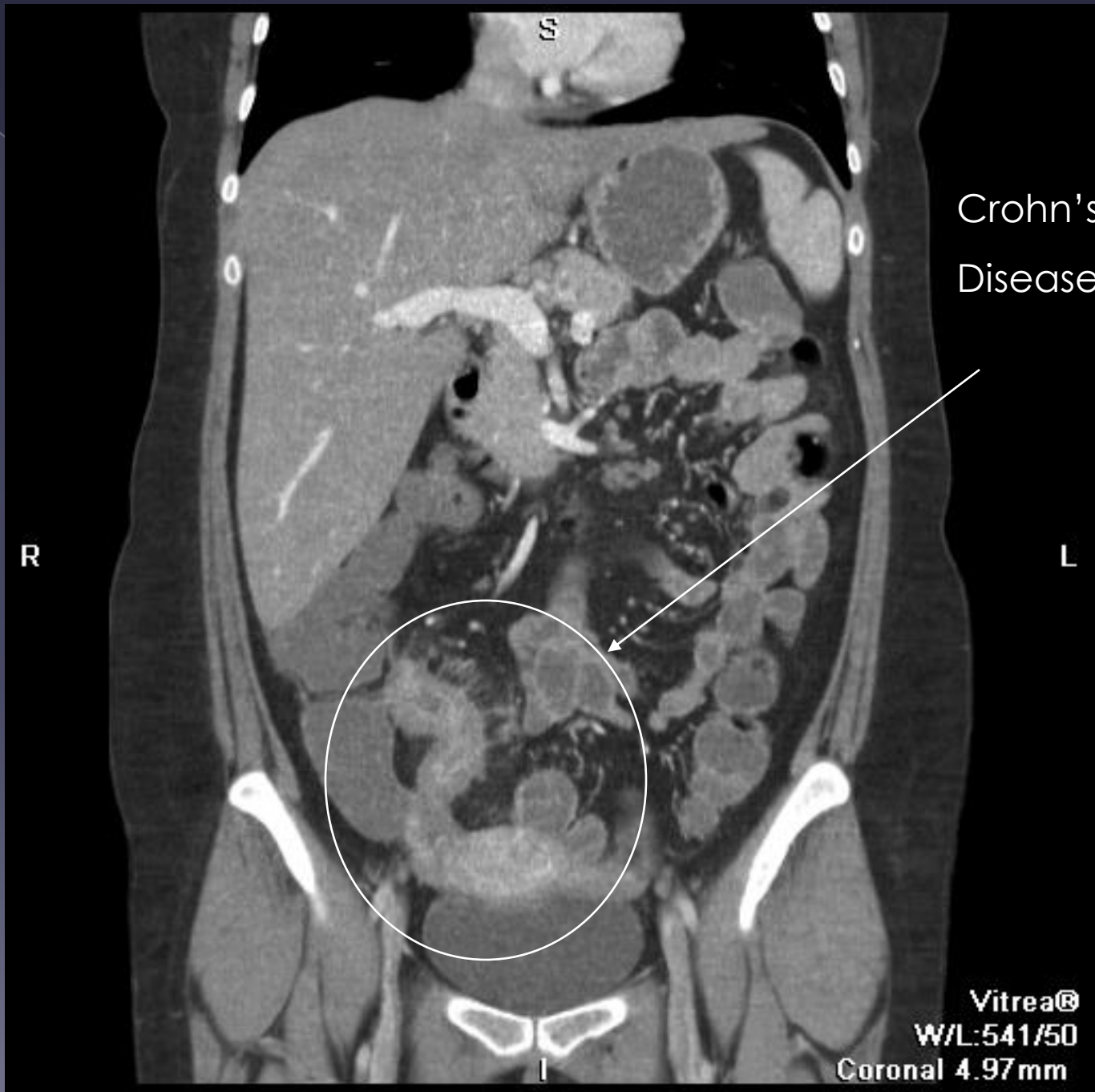




NORMAL SMALL BOWEL
WITH VOLUMEN

Coronal cuts simulate traditional SIFT view





Crohn's
Disease

R

L

I

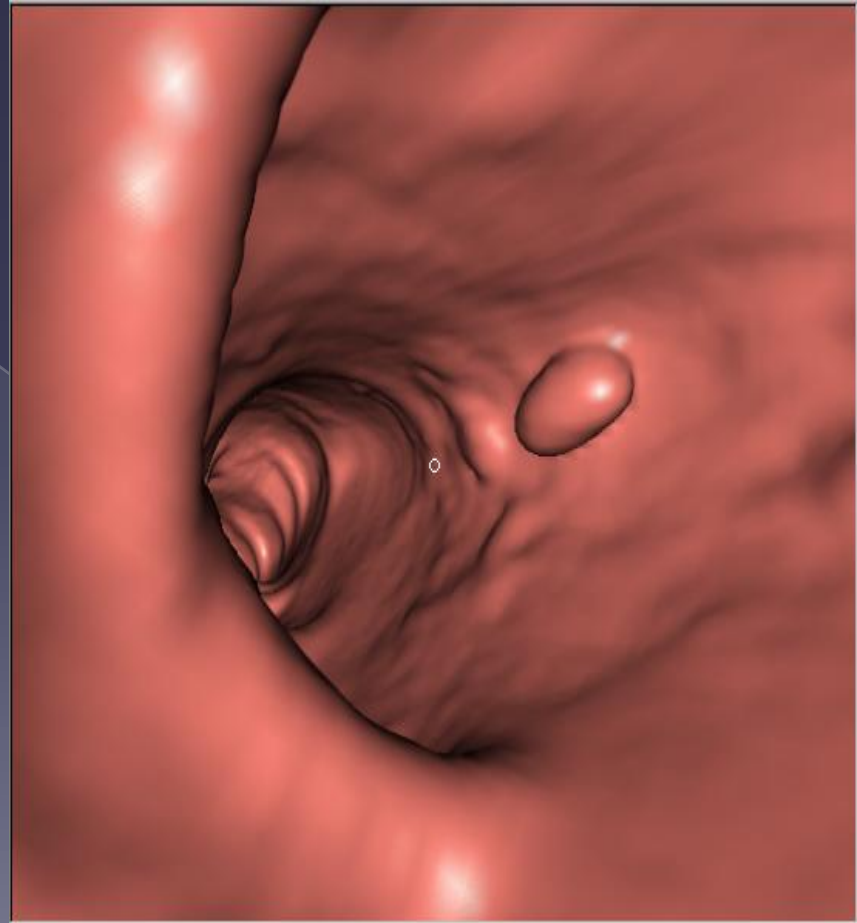
Vitrea®
W/L:541/50
Coronal 4.97mm



Evaluate all
abdomen
organs as well
as bowel

CT Colography

Virtual Colonoscopy

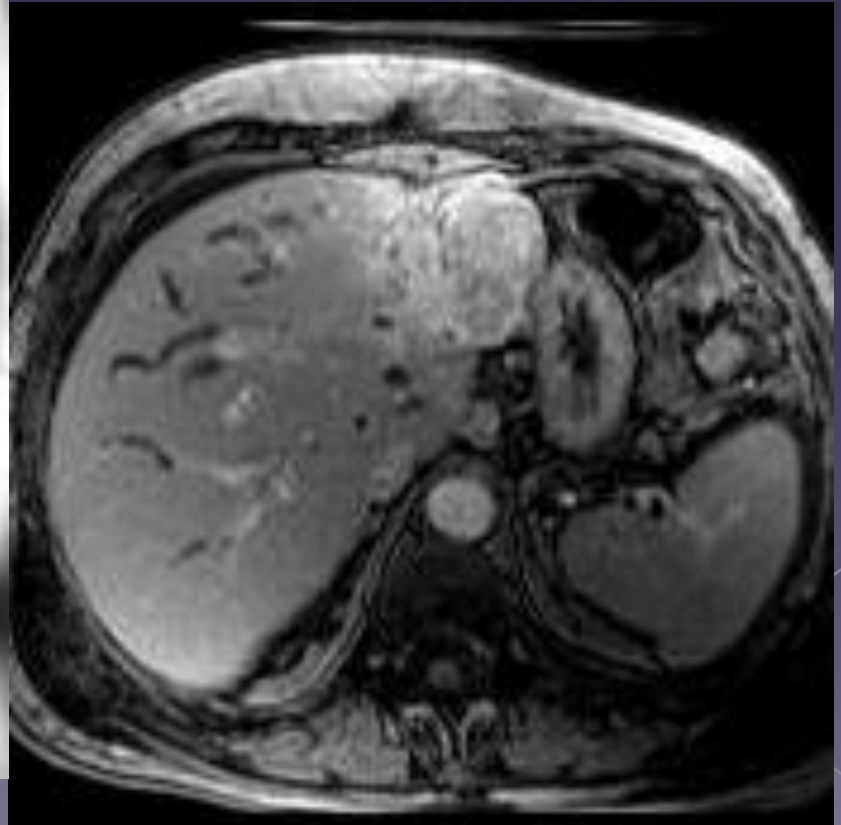
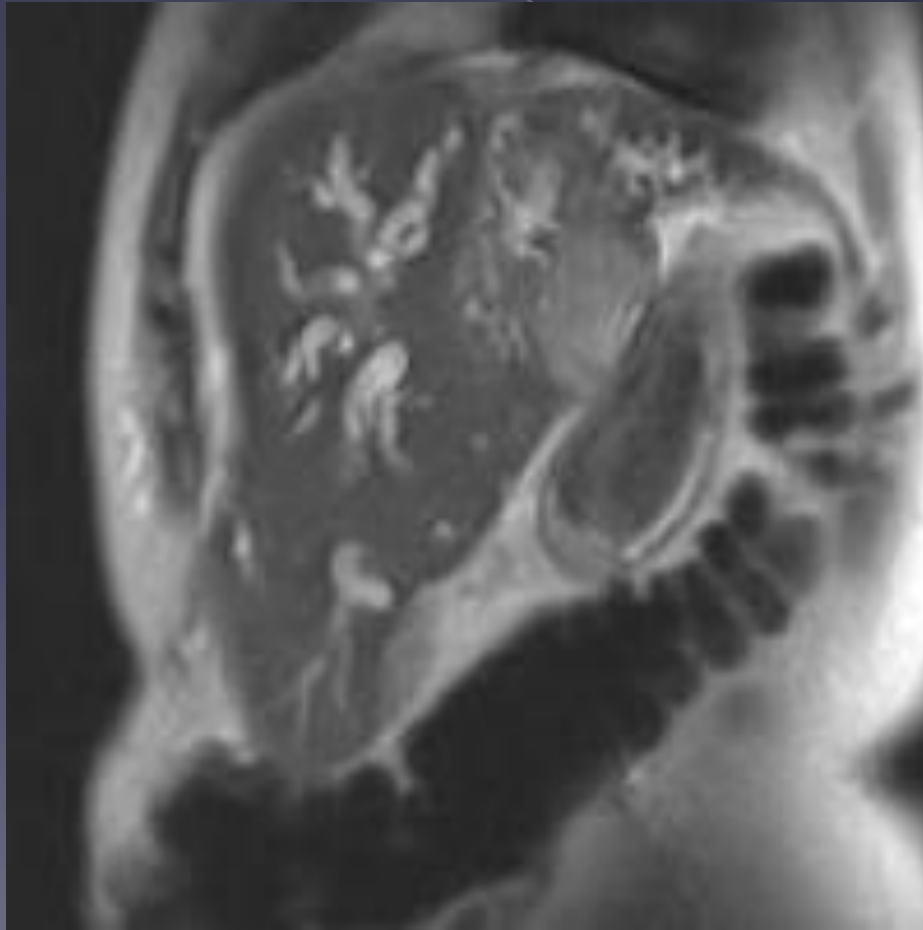


Newer Techniques

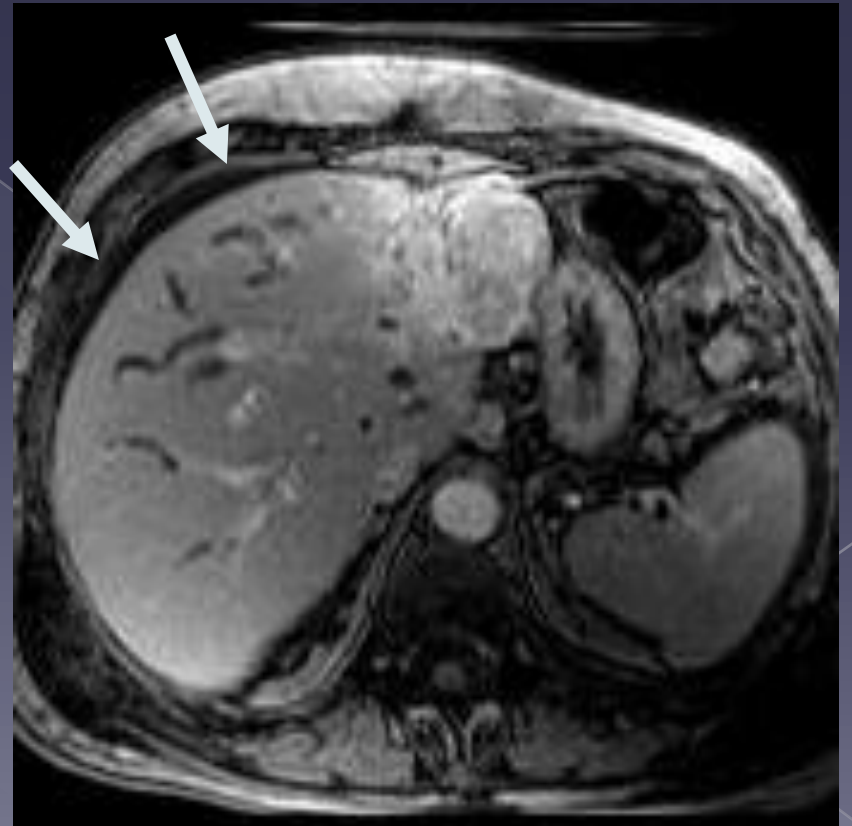
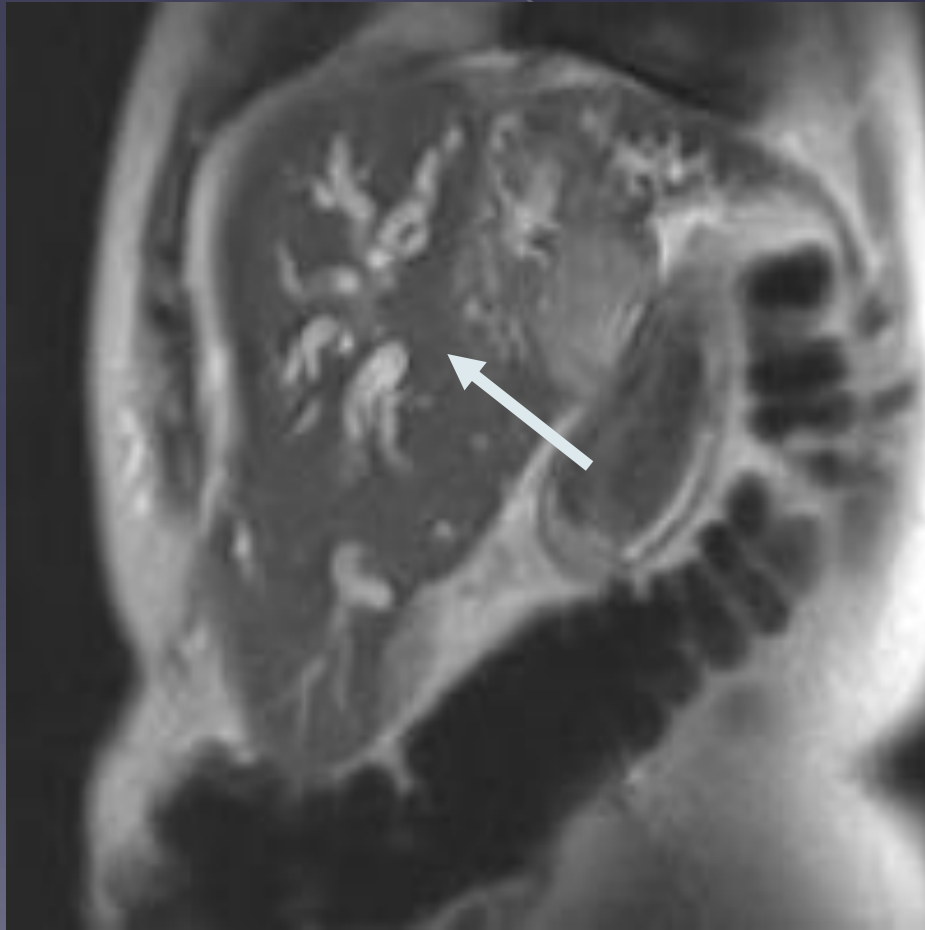
Magnetic Resonance

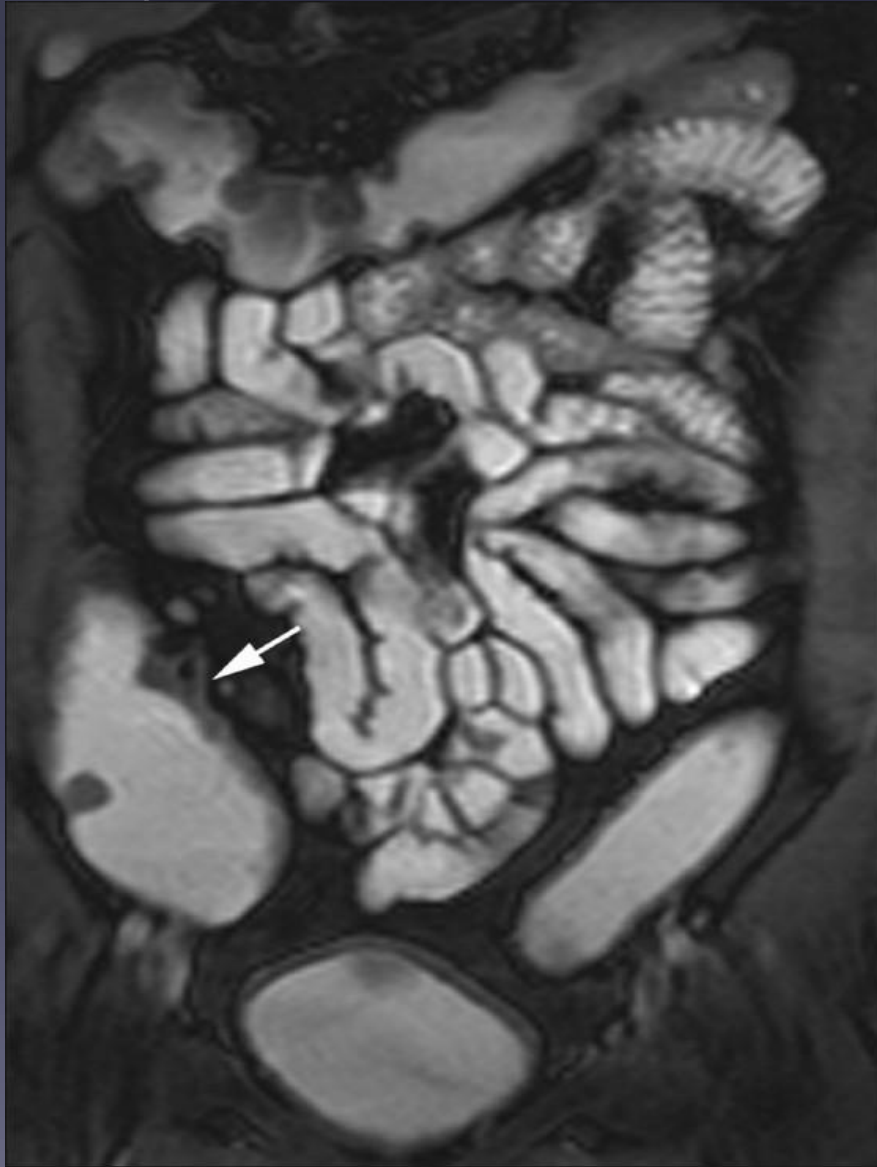
- MRI has become helpful in the detection and localization of ano-rectal CD
- Thin section coronal, axial and sagittal sequences
 - > can readily detect the presence of active distal colonic disease and perianal fistulae
 - > T2 weighted fat saturated sequence
 - > T1 weighted Gadolinium enhanced fat saturated sequence

Liver Disease associated with Crohns/UC



Primary Sclerosing Cholangitis





A patient with Crohn disease. MRI enterography examination shows good opacification of the small and large bowel with thickening of the inflamed cecal wall (arrow)

Imaging for Crohns Disease

Conclusion

- ◎ Useful Newer Techniques evolving
 - > **CT Enterography**
 - Comprehensive evaluation of all bowel & solid organs
 - > **Magnetic Resonance**
 - **Useful for ano-rectal disease**
 - Real-time MR has potential for detection of strictures
- ◎ Traditional imaging techniques still of value in selected cases

Thank
you