

# **ISCHEMIC COLITIS**

**How do we  
manage it**

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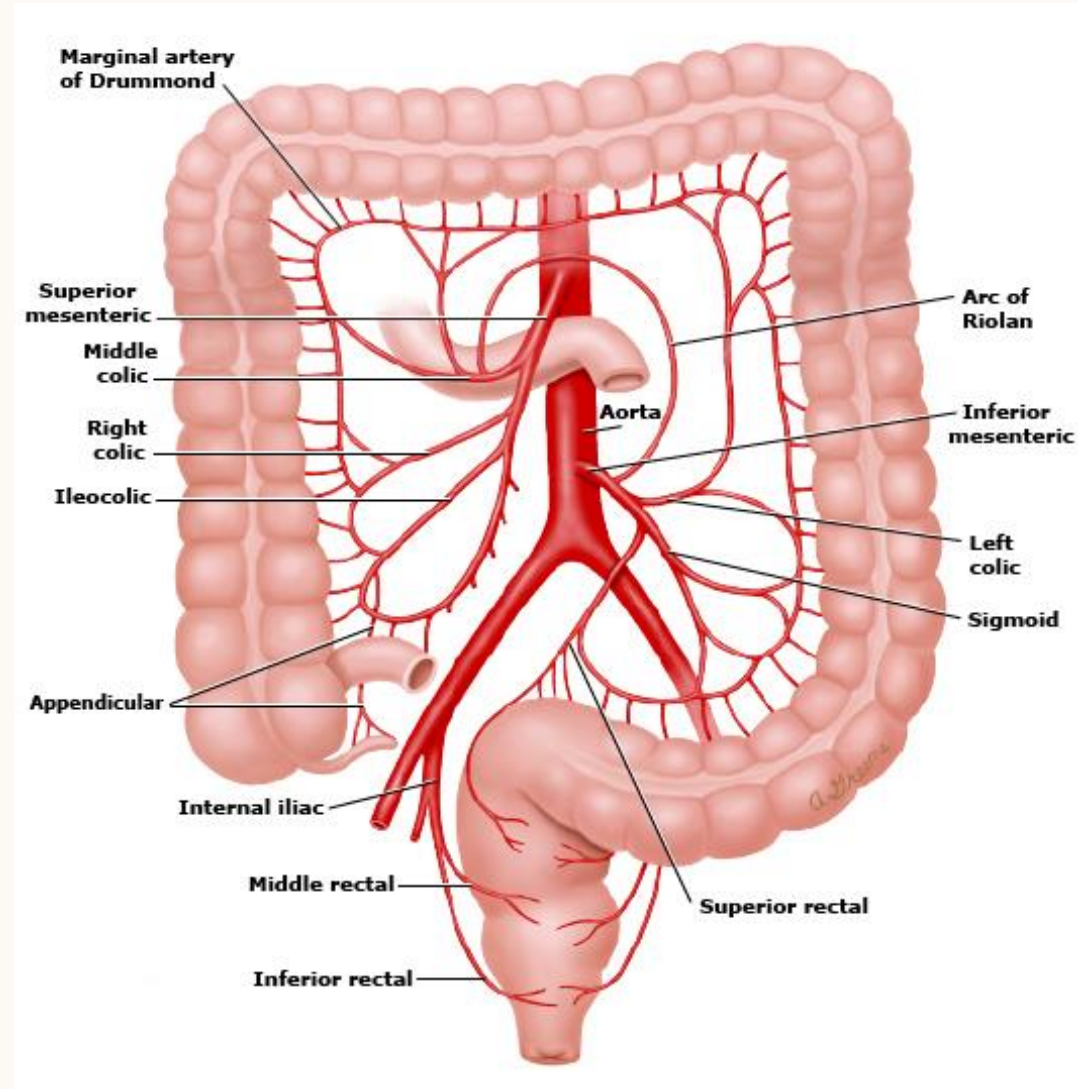
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# OVERVIEW

- ❖ Anatomy Review
- ❖ Ischemic Colitis
- ❖ Introduction
- ❖ Pathophysiology
- ❖ Underlying Causes
- ❖ Phases of IC
- ❖ Clinical Picture
- ❖ Investigations
- ❖ Management
- ❖ Conclusion

- The SMA and IMA communicate through the Marginal **artery of drummond**, runs in the mesentery close to the bowel along the splenic flexure.
- Points of communication between collateral arteries are at higher at risk for ischemia
- These points are the splenic flexure and the midsigmoid colon , however any segment of the colon may be involved



## Watershed territories

(1) the splenic flexure:

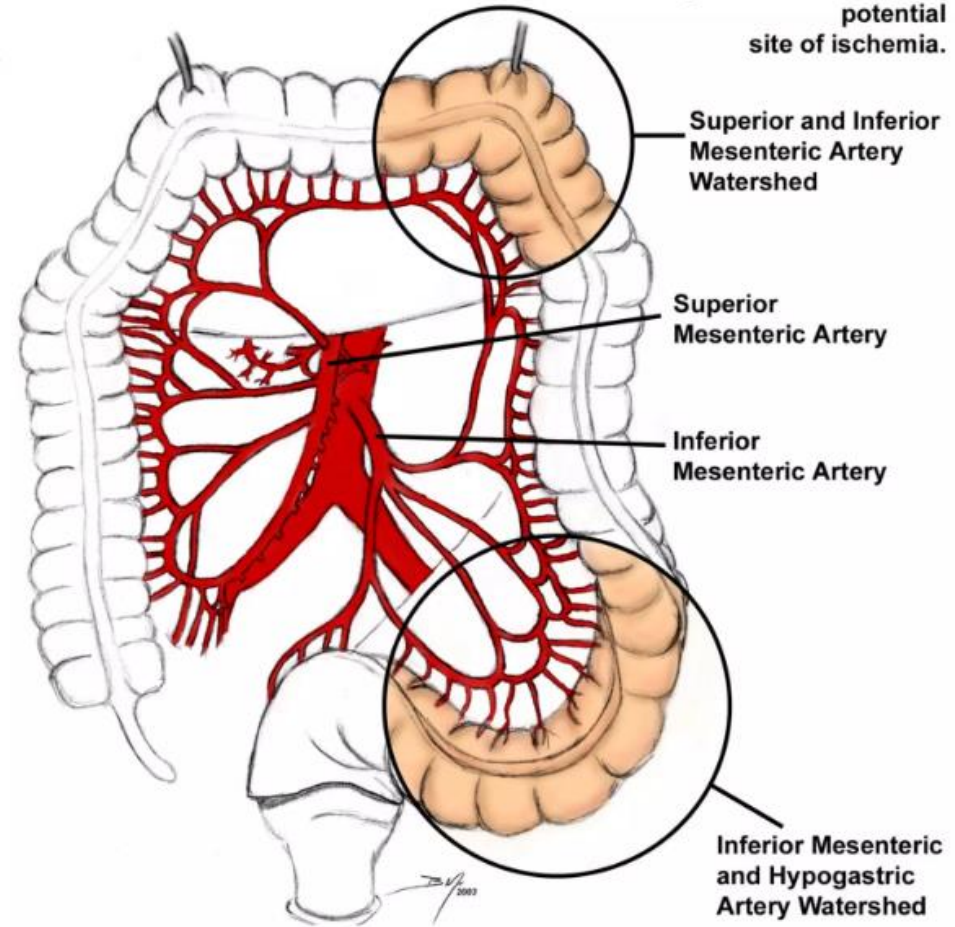
between the SMA and IMA blood supply

(2) the distal sigmoid colon:

between the IMA and hypogastric artery supply Limited collateral networks and are more vulnerable to low flow states

### Ischemic Colitis

Arterial blood supply to the large bowel showing the potential site of ischemia.



## Right Vs. Left

- The vasa recta are smaller and less developed in the right colon
  - These vessels sensitive to vasospasm

This explains the susceptibility of the right colon to ischemia

- The small bowel alone, the colon alone, or both may sustain hypoxic injury (mesenteric ischemias)
- Ischemic colitis is the most common form of intestinal ischemia.



- The male-to-female ratio is approx. 1:1
- A disease of elderly. It is rarely seen those <60 yrs.
  - The average patient age at diagnosis is 70 years
- Although frequent in the elderly, younger patients may also be affected.

**Two basic** mechanisms may cause bowel ischemia:

1. Diminished bowel perfusion.
2. Occlusive disease of the vascular supply

# CAUSES

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**Table 1. Conditions that predispose to ischemic colitis**

Cardiac failure or dysrhythmias  
Shock (sepsis, hemorrhagic, hypovolemic)  
Strenuous physical activities, ie long-distance running  
Arterial thrombus  
Cholesterol emboli  
Inferior mesenteric artery thrombosis  
Mechanical colonic obstruction

- Tumors
- Adhesions
- Volvulus
- Strangulated hernia
- Diverticulitis
- Intestinal prolapse

Hypercoagulable states

- Protein C and S deficiencies
- Antithrombin III deficiency
- Anticardiolipin syndrome

**Vasculitis**

Systemic lupus erythematosus

Polyarteritis nodosa

Wegner granulomatosis

Rheumatoid arthritis

Takayasu arteritis

Thromboangitis obliterans

**Iatrogenic surgical/procedural causes**

Aneurysmectomy

Aortic surgery

Coronary artery bypass surgery

Colonic surgery

Colonoscopy

Barium enema

Gynecologic surgery

Sickle cell disease

Hemodialysis

Thrombotic thrombocytopenia purpura

Airplane flights

Intra-abdominal inflammatory diseases

Schistosomiasis

Aortic dissection

Ruptured ectopic pregnancy

Trauma

**Table 2. Medications associated with ischemic colitis**

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Antihypertensive agents

Cocaine

Diuretics

Nonsteroidal anti-inflammatory agents

Digoxin

Estrogens

Oral contraceptives

Vasopressin

Pseudoephedrine

Alosetron

Danazol

Sumatriptans

Psychotropic drugs

Amphetamines

# PHASES OF ISCHEMIC COLITIS

- Regardless of the mechanism, the disease follows the same course.
- Depending on the cause and severity ,the morphologic pattern can be divided into 3 groups:

<b>• Transient Ischemia</b>	Mucosal infarction in which ischemic damage is confined to the mucosa
<b>2. Partial thickness ischemia</b>	Mural infarction in which the injury extends from the mucosa into the muscularis mucosa
<b>3. Full thickness infarction</b>	Transmural infarction

- **Transient Ischemia/ Partial Thickness**

Result of hypoperfusion rather than occlusive disease May involve any part of the gut and is usually patchy and segmental.

- **Full thickness**

Result of thrombosis or embolism of SMA More common in the small bowel, dependent on the mesenteric blood supply . Usually involves a long segment of bowel, tends to occur in the 2 watershed territories.

# CLINICAL PICTURE

- Mild colicky lower abdominal pain lasting few hours.
- Passage of bright red blood PR or maroon blood mixed with stool.
- Anorexia, nausea, vomiting, or abdominal distension
- Peritoneal signs ( 15 %)
- physical examination usually reveals only mild abdominal tenderness.



# INVESTIGATIONS

**Labs:** Labs will be normal in mild cases

Severe ischemia or necrosis may produce leukocytosis, metabolic acidosis, or an elevated lactate.

**Imaging** • Plain Radiography Dilatation of a part of the colon (early)  
Thumbprinting, pseudopolyps ( ?UC) Hose-like with loss of haustrations.

**Barium Enema** Acute stage ( spasm associated with thickening and blunting of the mucosal folds. Multiple mucosal thumbprinting)  
With progression of mucosal edema, the folds become thickened and ill defined. The final outcome is a long stricture with proximal bowel dilatation.

- Plain radiographic findings may be entirely normal, particularly early in the disease.
- However, the results of barium enema are abnormal in 90% of patients with IC

# X-RAY



# BARIUM ENEMA



DOUBLE-CONTRAST BARIUM ENEMA STUDY SHOWS A STRICTURE OF THE PROXIMAL DESCENDING COLON SECONDARY TO ISCHEMIA.

- **CT**

Depicts changes in the blood vessels ,also changes in the bowel wall. It may show:

Thromboembolism in the mesenteric vessels Irregular narrowing of the bowel lumen (thumbprinting) Possible bowel dilatation proximal to the ischemic segment of the bowel

Pneumatosis suggests transmural infarction.

- **MRI**

Sensitivity of MRI in the detection of bowel ischemia is comparable to that of CT.

MRI may be useful in depicting bowel-wall changes and in demonstrating mesenteric vascular abnormalities

## U/S

Bowel gas frequently affects visualization

- The bowel wall becomes thickened, and nodular and intramural hemorrhage and edema give rise to areas of reduced echogenicity.
- Echogenic areas may be seen in the bowel wall; these may reflect either areas of infarction infiltrate or clot

## Colonoscopy

The procedure of choice if the diagnosis remains unclear Findings at colonoscopy depend on the stage and severity of ischemia.

- **Early stages** of ischemia, petechial hemorrhages are interspersed with areas of pale, edematous mucosa.
- **Later**, segmental erythema, +/-ulcerations and bleeding
- The colon **single-stripe sign**, a single longitudinal ulcerated or inflamed colon strip, may characterize milder disease
- With more **severe ischemia**, the mucosa appears cyanotic, dusky, gray, or black.
- **Chronic ischemia** is characterized by stricture, decreased haustrations, and mucosal granularity may occur several weeks or months later



# MANAGEMENT

The patient management is based on the severity of ischemia:

<ul style="list-style-type: none"><li>• <b>Transient Ischemia</b></li></ul>	Treated symptomatically Observation with Bowel rest, IVF, O <sub>2</sub> and optimise cardiac function
<b>2. Partial thickness ischemia</b>	-Close observation, IVF, broad-spectrum antibiotics -If stricture develops and is symptomatic, resection may be required.
<b>3. Full thickness infarction</b>	Surgical resection



## Full thickness/Gangrenous infarction

- Approximately 20% of patients with IC will require surgery because of peritonitis or clinical deterioration despite conservative management
- Emergency resection of non viable bowel is required and colostomy is usually required.

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### Table 3. Indications for surgery in ischemic colitis

Peritoneal signs (perforation, fulminant colitis, gangrene)

Persistent fever or sepsis

Persistent symptoms beyond 2-3 weeks

Symptomatic strictures

# MANAGEMENT

- At laparotomy, all affected bowel is resected, and the mucosa of the specimen is examined in OR to ensure normal surgical margins.
- Questionably viable areas of colon are generally resected unless extensive are left intact and a second-look operation is planned 12 to 24 hours later.
- Primary anastomosis is usually not performed
- A colostomy is formed with the proximal colonic loop, the distal loop is either exteriorized as a mucous fistula or closed to form a Hartman pouch.
- Despite resection, the mortality rates exceed 50% in those with infarcted bowel

# CONCLUSION

- Always consider the diagnosis of ischemic colitis whenever contemplating the diagnosis of inflammatory bowel disease in the elderly.
- Thumbprinting of the colon on plain abdominal radiographs suggests ischemic colitis.
- CT with oral & IV contrast is the imaging modality of choice to assess distribution & phase of Colitis.
- Finding on CT or MRI (e.g., bowel wall thickening, edema, thumbprinting, pericolonic fat stranding) are suggestive of IC, but not specific for diagnosis

- CT (MRI) findings of colonic pneumatosis & porto-mesentric venous gas are highly suggestive of transmural colonic infarction, but not diagnostic
- Common findings (good prognosis) are non-specific & more specific findings (bad prognosis) are Uncommon
- Evaluation is by CT & Colonoscopy not Angiography CT scan is the initial screening test; may help determine prognosis  
Colonoscopy is the test of choice for confirming diagnosis; may help determine prognosis
- Antibiotics for moderate to severe Ischemic Colitis
- Surgical consultation is warranted in all cases of suspected Ischemic Colitis.

**THANK YOU**

