Ischemic colitis (ischemic disease of the colon) was first described in 1966. It occurs when there is an occlusion of branches of the superior mesenteric (SMA) or inferior mesenteric arteries; the vast majority of cases describe the lesion in the splenic flexure and left colon. This severe illness is very common among the elderly with pronounced cardiovascular disorders. The onset is followed by an acute stabbing abdominal pain and rectal bleeding with diarrhea in most of the cases. Ischemic disease of the colon requires immediate actions; the sooner the treatment is administered, the more benign the outcome is.

Definition and Background

Ischemic colitis has its pre-conditions, namely, chronic cardiovascular disorders, thrombophilia, small- and medium-vessel vasculitis. Also, those women who are prescribed contraceptive pills tend to develop this condition. Age plays a pivotal role in the manifestation of the arterial occlusion of the colon as well.

There might be a severe abdominal pain leading to the shock due to the necrotic process developing on the background of the arterial occlusion and affected nourishment of the colon (inadequate flow of the blood to the bowel) respectively.
Etiology of Ischemic Colitis

- **Chronic constipation** contributes to the development of the condition owing to the **vassal spasm** while strains. Mature age enhances the incidence of the occlusion of the long arteries of the colon as the feature of the general disorder **atherosclerosis**, which stipulates the narrowing of the arterial lumen, hence, the blood flow does not fulfill the metabolic demand of the intestine.

- **Diffuse disease of the small and medium vessels** makes the colon susceptible to the ischemic attacks (vacuities).

- **Heart failure** (decreased cardiac output or **arrhythmias**).

![Image: “76-year-old woman with rectal bleeding. Right colon biopsy.” by Ed Uthman from Houston, TX, USA – Ischemic Colitis Uploaded by CFCF. License: CC BY 2.0](image)

- Hemodialysis
- **Shock** (hemorrhage, sepsis, hypovolaemia).
- **Abdominal trauma**
  - Aorta surgery, gynecological operations, cardiac bypass, inferior mesenteric artery ligation while colectomy.
  - **Hypertension** (cholesterol emboli), **stroke**.
  - **Diabetes mellitus** may predispose the ischemic attack in the intestine.
  - The colon is prone to develop ischemia itself (**arterial obstruction**) due to the low blood flow in the organ, in comparison to the rest parts of the digestive system; this fact is stipulated by the anatomy of the organ.
  - Mechanical obturation of the colonic arteries by **tumors** and **blood clots** (hypercoagulation in rheumatic disorders).

- Certain groups of drugs can provoke the colon ischemia (**constipation-inducing drugs**, **immunomodulator drugs**, **illicit drugs**: amphetamine, cocaine, appetite suppressants, chemotherapy, decongestants, **diuretics**, hormonal therapy, psychotropic drugs and so forth).

Epidemiology of Ischemic Colitis

The cases of ischemic colon mid-children are very rare; the risk of incidence of the condition **increases with age**, especially after 49 years. There is a **female predominance** regarding the disease in the age greater than 69 years. The rate of occurrence of the colon ischemia is about 16.3 cases per 100,000 persons-years.
Internationally
1 in 1,000 hospitalizations are regarded to ischemic colitis worldwide. This figure is underestimated due to the mild or transient forms of the nature of the disease.

Presentation of Patients with Ischemic Colitis
The condition is sometimes hard to diagnose due to the non-specific symptomatic of an “acute abdomen” featured by an acute onset of the pain in the left iliac fossa.

- **Diarrhea** up to 20 times and may bother the patient even at night; stool contains blood and mucus (very common symptom).
- **Rectal pain**, as diarrhea advances.
- **Abdominal pain**, very often stubbing when there is a severe occlusion of the colonic arteries.
- **Constipation** is a rarer symptom than diarrhea and manifestation of this symptom depends on the allocation of ischemia.
- **Weight loss** and absence of appetite, nausea (75%)
- **Fever** may occur in complicated cases (when there are large areas of necrotic tissue in the colon).
- Blood in stool and chronic inflammation in the intestine may cause **anemia**.

Acute mesenteric arterial embolism (AMAE): abdominal apoplexy

AMAE has the most painful onset, followed by **cardiac symptomatic**: atrial fibrillation, MI. Also, there may be a history of **heart valves disease** or previous incidence of **emboli**. There is nausea and numerous cases of vomiting in an “abdominal attack.”
Acute mesenteric arterial thrombosis (AMAT)

Occlusion takes place when atherosclerotic emboli block the lumen of the vessels in the colon due to acute MI (drop in cardiac output), congestive heart failure, ruptured plaque. This condition is accompanied by severe diffuse pain which usually occurs after a meal (10-15 minutes after). It can last for several hours: growing nausea, vomiting, altered bowel habits, “fear” of food and early satiety.

Nonocclusive mesenteric ischemia (NMI)

This is very common in the elderly, and usually represents the after-effect of such conditions as respiratory failure, shock (sepsis, MI) followed with severe hypotension; intake of digitalis.

The flow of this type of colonic vessels obstruction manifests with vomiting affiliated with pain, dizziness, tachycardia, hypotension, frequent stool with blood.

Mesenteric venous thrombosis (MVT)

This type of ischemic colitis is more common in younger patients and featured with acute or subacute pain. Occlusion affects at the beginning the small intestine rather than a colon. MVT is very treacherous as the development of the full range of symptoms of occlusion takes weeks before being noticed.

Hypercoagulability always presents in the history of such sufferers due to continuous use of contraceptive pills; pulmonary embolism; cancer; liver pathology; pancreatitis; intra-abdominal infection; porta-caval surgery.

Physical Examination of Ischemic Colitis

The most prominent symptom of the condition is the pain which possesses various shades: from moderate to severe, diffused or localized, persistent or colicky. The pain is not responsive to painkillers and opioids. Also, the onset of the disease depends on the allocation of the occlusion in the colon and the stage of the disease.

- Early stage: physical signs are not sound and non-specific; distended abdomen; stool positive to blood; absence of peritonitis; minor tenderness.
- Later tenderness and pain exacerbate and reflect the allocation of the ischemic lesion in the bowel; a tender mass in the abdomen may be palpable. There might be a foul smell from the mouth as the necrosis advances; fever; aggravation of the general condition; hypotension; tachycardia; and the patient may be confused (altered mental status).

Differential Diagnosis of Ischemic Colitis

- Left-sided peritonitis as the after-effect of perforated hollow viscus or pancreatitis
Diagnosis of Ischemic Colitis

Laboratory studies

In advanced stages of ischemic colitis (infarction and necrosis), an increase of these markers may become significant: lactate, LDH, CPK, amylase levels, leucocytes, alkaline phosphatase, inorganic phosphate, intestinal fatty acid binding protein and alfa-glutathione S-transferase. It is important to outline that they are not informative in mild forms of ischemia of the colon.

ECG is used for exclusion of MI, atrial fibrillation, aneurysm of the aorta and so forth.

Imaging studies

Plain abdominal radiography is administered in order to exclude colon infarction. It is very informative as it may indicate particular non-specific findings: “thumb-printing” a distinguishing feature of the disease (due to mucosal edema/hemorrhage), air-filled loops, colonic aperistalsis, mural thickening and exhausted bowel are detected in up to 21% of patients.

Barium enema: in 90% of cases of ischemic colitis, this study reveals abnormal findings; however, it is rarely used in the diagnostics. There may be: segmental region of abnormality; “thumb-printing”; ulceration; spasm; and strictures due to fibrosis.

CT scan: CT reveals thickening of the bowel walls, narrowed lumen of the bowel, “target
“sign” low-density ring bordering lumen due to submucosal edema, mesenteric edema, and visible superior mesenteric artery thrombosis.

**Angiography** may reveal increased arterial caliber, enhanced arteriovenous transit time and dilated veins.

**Ultrasound**: This method of examination is not very common due to the presence of bowel gas, however, reduced peristalsis may be observed; edema produces hypoechoic wall. In a hemorrhage, there are places of increased echogenicity.

**Colonoscopy**: It is one of the most informative examinations in ischemic colitis that reflects the intrinsic pathophysiological picture of the bowel walls.

### Staging
- Transient ischemia
- Partial thickness ischemia
- Full thickness infarction

### Management of Ischemic Colitis

#### Pharmacotherapy

Treatment depends on the severity of the condition and complications that may occur if the cure is not prescribed timely.

The transient stage does not require any serious intervention; these patients are closely observed in the outpatient department and prescribed antibiotics and fluid diets.

Later stages of the disease require:
- Hospitalization
- IV fluids (adequate fluid resuscitation)
- Bowel rest
- Optimization of cardiac function and oxygenation
- Exclusion of vasopressors
- Broad spectrum antibiotics
- Heparinisation and a papaverine infusion
- Treatment of all underlying medical disorders (especially cardiovascular group).

#### Surgical intervention

The inevitability of surgery supported by hypotension and heart diseases, thus, colon is affected by occlusion of the arteries leading to ischemia, necrosis and gangrene consequently. The surgery is to:
- Remove tissues severely affected with ischemia (areas of necrosis)
- Mend the hole in the colon
- Provide the blood flow through blocked vessels
- Remove a stricture or narrowed part of the colon due to the scarring that causes vessel blockage.
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