

## **Crohn's Disease: Causes, Pathophysiology, Symptoms and Treatment**

Crohn's disease is a long-term condition that causes inflammation of the lining of the digestive system. It causes tissue destruction and inflammation anywhere within the gastrointestinal tract but the most common site for the disease to start is the last part of the small intestine known as the ileum.

The small intestine has three sections:

1. The duodenum,
2. Jejunum and
3. Ileum.

The small intestine is where food is digested and absorbed into the bloodstream.

The structure of the gut then changes to become the large intestine (colon and rectum, sometimes called the large bowel). The colon absorbs water and contains food that has not been digested, such as fiber. This is passed into the last part of the large intestine, where it is stored as feces.

### **Causes of Crohn's disease**

Familial genetic inheritance ( frameshift mutation in the NOD2 gene

Environmental factors ie smocking

Microbial,

High fat dietary and

Vascular factors

### **Pathophysiology of Crohn's disease**

The inflammation in Crohn's disease is due to a foreign pathogen in the GI tract such as mycobacterium paratuberculosis. Listeria and pseudomonas spp as compared to ulcerative colitis where the inflammation is due to an autoimmune disorder.

Once the antigens have been presented to the body the T helper cells produce cytokines ie interferon-gamma and tumor necrosis factor attracting the inflammatory cells such as macrophages which continue with the production of inflammatory substances.

After activation by antigen presentation, unrestrained responses of type 1 helper cells predominate as a consequence of defective regulation

Th1 cytokines ie IL2 and TNF1 stimulate inflammatory responses.

The inflammatory cells recruited by these cytokines release non-specific inflammatory substances including

- Arachidonic acid metabolites,
- Proteases,
- Free radicals and
- Platelet-activating factors which result in direct injury to the intestine.

Microscopically the initial lesion starts as a focal inflammatory filtrate around the crypts followed by ulceration of the superficial mucosa. Later the inflammatory cells invade the deep mucosal layers and form noncaseating granulomas.

These granulomas extend through the layers of the intestinal wall and into the mesentery and lymph nodes.

Neutrophil infiltration into the crypts forms cryptic abscess leading to the destruction of the crypt and atrophy of the colon. Transmural inflammation results in thickening of the bowel wall and narrowing of the lumen that may cause obstruction, deep ulceration or fistulization.

## Signs and symptoms of Crohn's disease

The characteristic presentation of Crohn's disease is *abdominal pain (RLQ) and diarrhea*.

Other signs and symptoms

- Rectal bleeding
- Malabsorption
- Fever
- Weight loss and anorexia
- Nausea and vomiting
- Fatigability
- Bone loss
- Growth failure in children
- Depression and anxiety

## Diagnosis and investigation

### Physical Examination

Vital signs –normal but tachycardia may be present in anemic patients

GI normal to [acute abdomen](#) and hematochezia

GENITOURINARY –skin tags, fistulas, and ulceration on perianal region

Possible arthritis, [jaundice](#), erythema nodosum

Hypercoagulable state

## Laboratory Studies

[Complete blood count,](#)

[Liver function tests,](#)

Inflammatory markers,

Serologic tests,

Stool study,

## Imaging studies

Plain Abdominal radiograph

Ct scan

Barium contrast study

CT enterography

Endoscopy

Colonoscopy ,ileocolonoscopy

## Treatment of Crohn's Disease

Treatment involves administration of:

5 aminosalicylic acid derivatives such as mesalamine, Corticosteroids most commonly prednisone, Immunosuppressive agents like methotrexate, Monoclonal antibodies, Antibiotics – ciprofloxacin and antidiarrheal agents –loperamide

If the medical management is ineffective in Crohn's disease treatment then the surgical method is sought.

## Surgical management

Surgery doesn't cure Crohn's disease. It involves the resection of the affected bowel, Ileocolonostomy/proximal loop ileostomy, Bypass surgery or strictureplasty