

# Small and Large Intestinal pathology, part 1

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# Diseases of the intestines

- ▶ Intestinal obstruction
- ▶ Vascular disorders
- ▶ Malabsorptive diseases and infections
- ▶ Inflammatory bowel disease.
- ▶ Polyps and neoplastic diseases

# Intestinal obstruction

- ▶ Mechanical obstruction:

- ▶ Intussusception

- ▶ Hernias.

- ▶ Adhesions.

- ▶ Volvulus

- ▶ Tumors.

- ▶ Diverticulitis

- ▶ Infarction

- ▶ Non-mechanical obstruction

- ▶ Hirschsprung disease

- ▶ Neurological disorders.

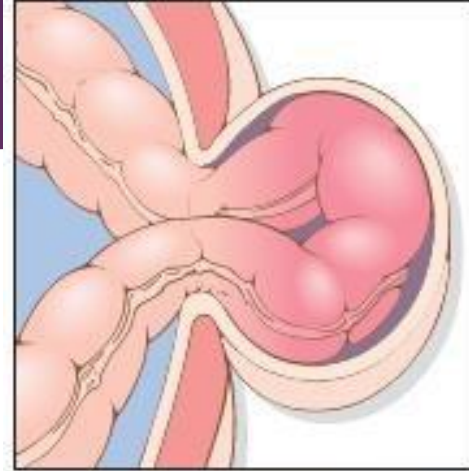
- ▶ Drugs....etc

# Clinical picture of intestinal obstruction.

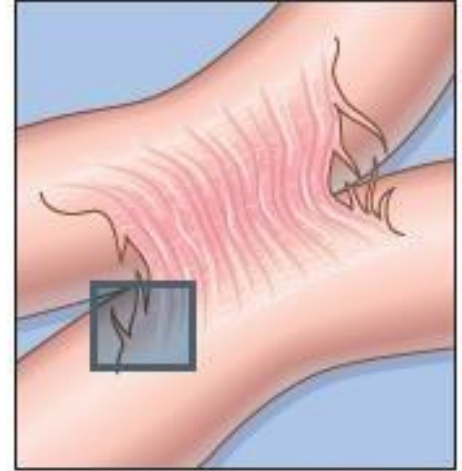
- ▶ Abdominal pain
  - ▶ Distention
  - ▶ Vomiting
  - ▶ Constipation.
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- ▶ Acute or chronic.

80% of mechanical obstructions

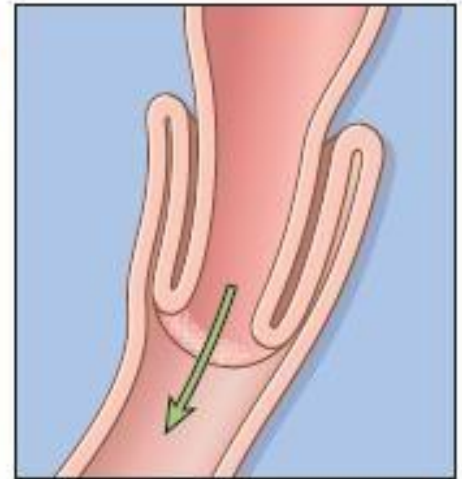
Herniation



Adhesions



Volvulus



Intussusception

# Intussusception

- ▶ Segment of the intestine constricted by a wave of peristalsis, telescopes into the immediately distal segment.
- ▶ Once trapped, invaginated segment is propelled by peristalsis, and pulls mesentery with it.
- ▶ **Most common cause of intestinal obstruction in children younger than 2 years of age.**
- ▶ Untreated progresses to infarction.

# Causes of intussusception

- ▶ < 2years : **Idiopathic in most cases.**
- ▶ Peyer patches hyperplasia (rotavirus vaccine, viral infections)
- ▶ Meckles diverticulum (ileum)
- ▶ Old children & adults: Intraluminal mass or tumors

# Clinical features:

- ▶ **Abdominal swelling**
- ▶ **Vomiting**
- ▶ **Passing stools mixed with blood and mucus (currant jelly stool)**
- ▶ **Pain.**

# Management

- ▶ Contrast enemas in uncomplicated idiopathic cases.
- ▶ Surgery if complicated or if masses are the leading point.

# Hirschsprung Disease

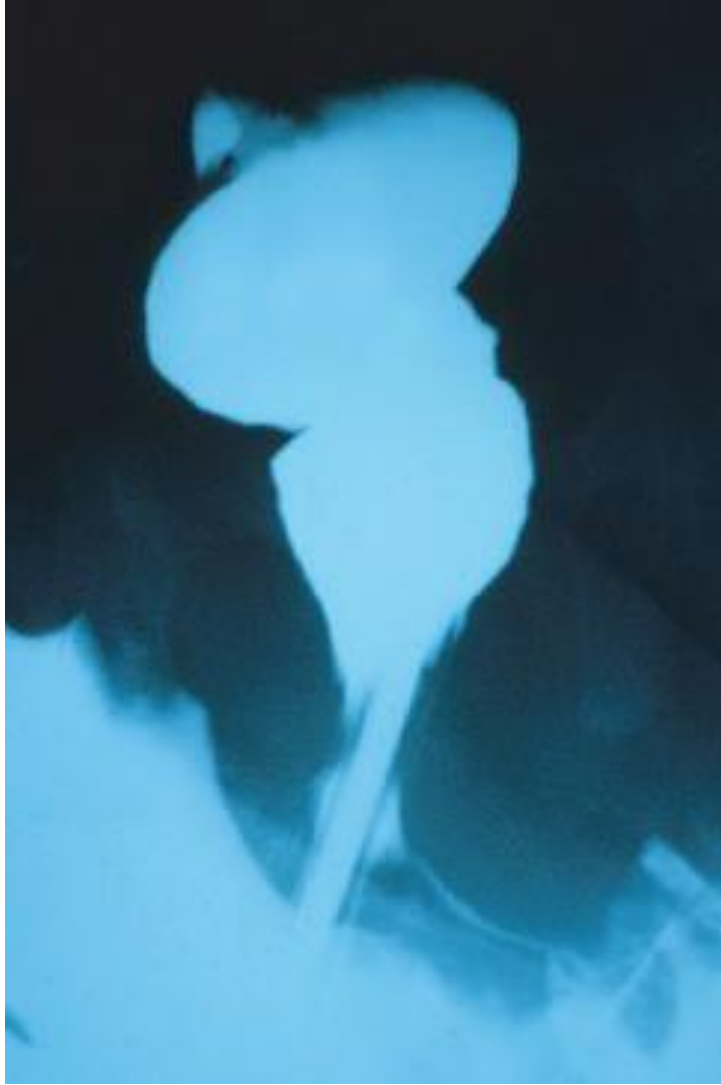
- ▶ Congenital defect in colonic innervations
  - ▶ Congenital aganglionic megacolon
  - ▶ More common in males
  - ▶ More severe in females
  - ▶ Risk increase in siblings.
- 
- ▶ **Typical presentation:**
- 
- ▶ Neonatal failure to pass meconium
  - ▶ Obstructive constipation.

# Pathogenesis

- ▶ During embryogenesis
  - Disrupted migration of neural crest cells from cecum to rectum.
- ▶ Lack of Meissner submucosal plexus and the Auerbach myenteric plexus.
- ▶ Failure of coordinated peristaltic contractions.
- ▶ Mutations in RET: in familial cases and 15% of sporadic
- ▶ Other genes and environmental factors play role.

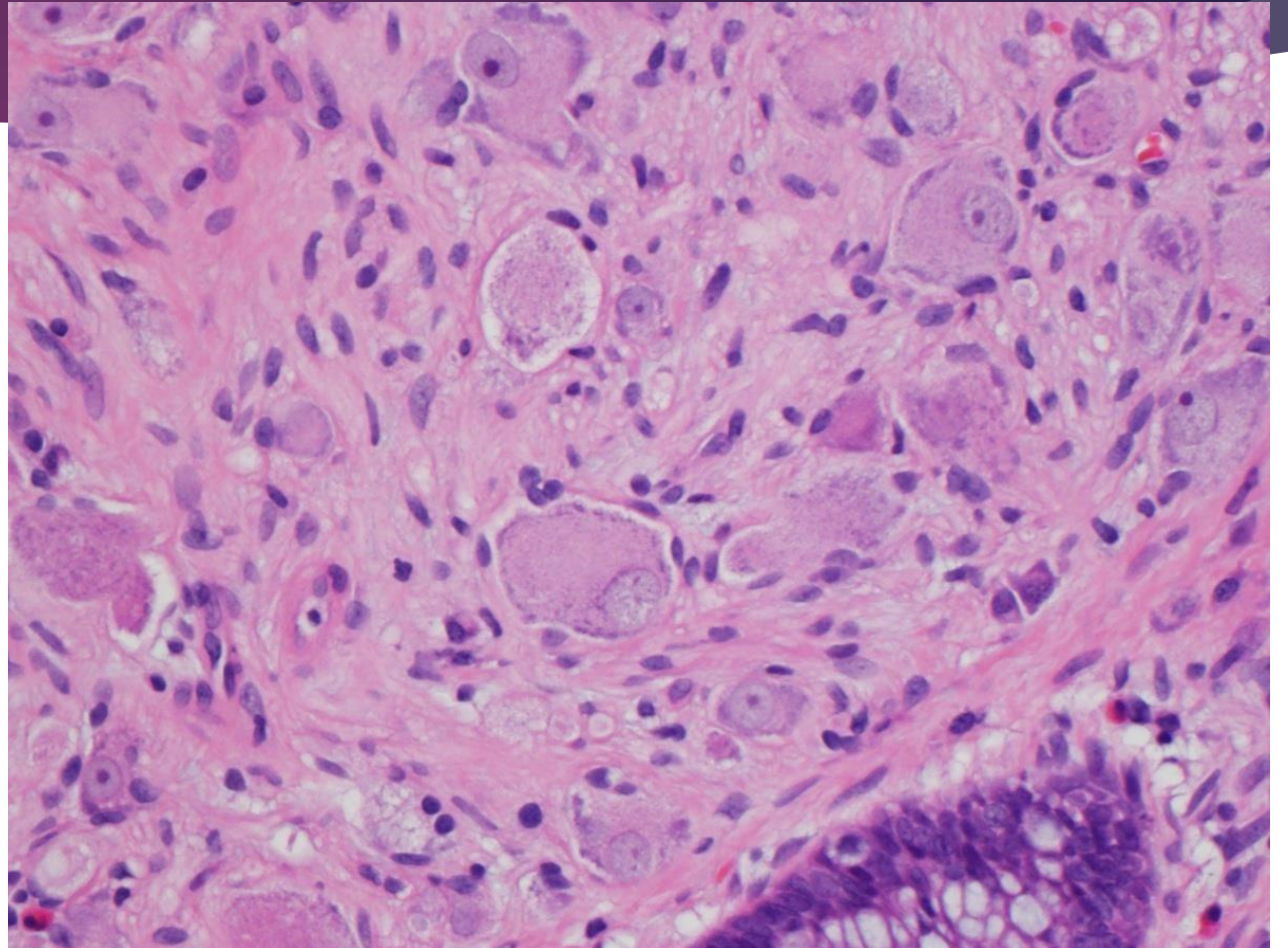
# Morphology

- ▶ Rectum always involved.
- ▶ Extent is variable.
- ▶ Most cases in rectosigmoid.
  
- ▶ **Macroscopic**
- ▶ Aganglionic region normal or contracted
- ▶ Proximal normal segment progressively dilated.
  
- ▶ **Diagnostic workup: barium enema and BIOPSY.**



Robbins Basic Pathology 10th edition

# ganglion cells



<http://www.pathologyoutlines.com>

# Complications

- ▶ Enterocolitis
  - ▶ Fluid and electrolyte disturbances
  - ▶ Perforation
  - ▶ Peritonitis
- 
- ▶ **Treatment:**
  - ▶ Surgical resection of aganglionic segment and anastomosis of normal segments.

# VASCULAR DISORDERS OF BOWEL

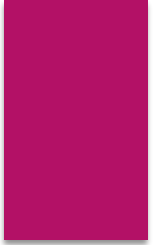
- ▶ Ischemic Bowel Disease
- ▶ Hemorrhoids

# Hemorrhoids

- ▶ Dilated anal and perianal collateral vessels that connect the portal and caval venous systems.

## **Predisposing factors:**

- ▶ Constipation and straining
  - ▶ Venous stasis of pregnancy,
  - ▶ Portal hypertension.
- 
- ▶ External and internal hemorrhoids

- 
- ▶ Thin -walled, dilated, submucosal vessels beneath anal or rectal mucosa.
  - ▶ **Symptoms:** Bleeding, pain, thrombosis and inflammation

# DIARRHEAL DISEASE

- ▶ Diarrhea: increase in stool mass, frequency or fluidity.
- ▶ Dysentery: painful , bloody, small volume diarrhea.

- ▶ **Malabsorptive Diarrhea**

Pancreatic insufficiency.

Celiac disease

Crohn disease

Cystic Fibrosis

Lactase (Disaccharidase) Deficiency

Abetalipoproteinemia

- ▶ **Infectious Enterocolitis**

- ▶ **Inflammatory bowel diseases.....**

# Malabsorptive Diarrhea

- ▶ **Chronic.**
- ▶ Defective absorption of fats, fat- and water-soluble vitamins, proteins, carbohydrates, electrolytes, minerals and water
- ▶ **Hallmark is : steatorrhea.**

# Malabsorptive diarrhea

Defect in one of the following:

- ▶ Intraluminal digestion.
- ▶ Terminal digestion.
- ▶ Transepithelial transport.
- ▶ Lymphatic transport.

# Manifestations:

- ▶ Weight loss, anorexia,
- ▶ Flatus, abdominal distention,
- ▶ Borborygmi, Muscle wasting
- ▶ Anemia and mucositis (iron, pyridoxine (VB6), folate, or vitamin B12 deficiency)
- ▶ Bleeding (vitamin K deficiency)
- ▶ Osteopenia and tetany (calcium, magnesium, or vitamin D deficiency)
- ▶ Neuropathy (vitamin A or B12 deficiency)
- ▶ Skin and endocrine disorders.

# Cystic Fibrosis

- ▶ Mutations in cystic fibrosis transmembrane conductance regulator (CFTR)
- ▶ Defects in ion transport across intestinal and pancreatic epithelium.
- ▶ Thick viscous secretions.
- ▶ Mucus plugs in pancreatic ducts >>> pancreatic insufficiency (80% of patients).
- ▶ Defect in intraluminal digestion.

# Celiac Disease

- ▶ *Gluten sensitive enteropathy*
- ▶ Immune mediated enteropathy
- ▶ Wheat, rye or barley.
- ▶ Genetically predisposition, HLA-DQ2 or HLA-DQ8.
- ▶ Treatment: gluten free diet.
  
- ▶ Association with: type 1 diabetes, thyroiditis, and Sjogren syndrome

# Pathogenesis

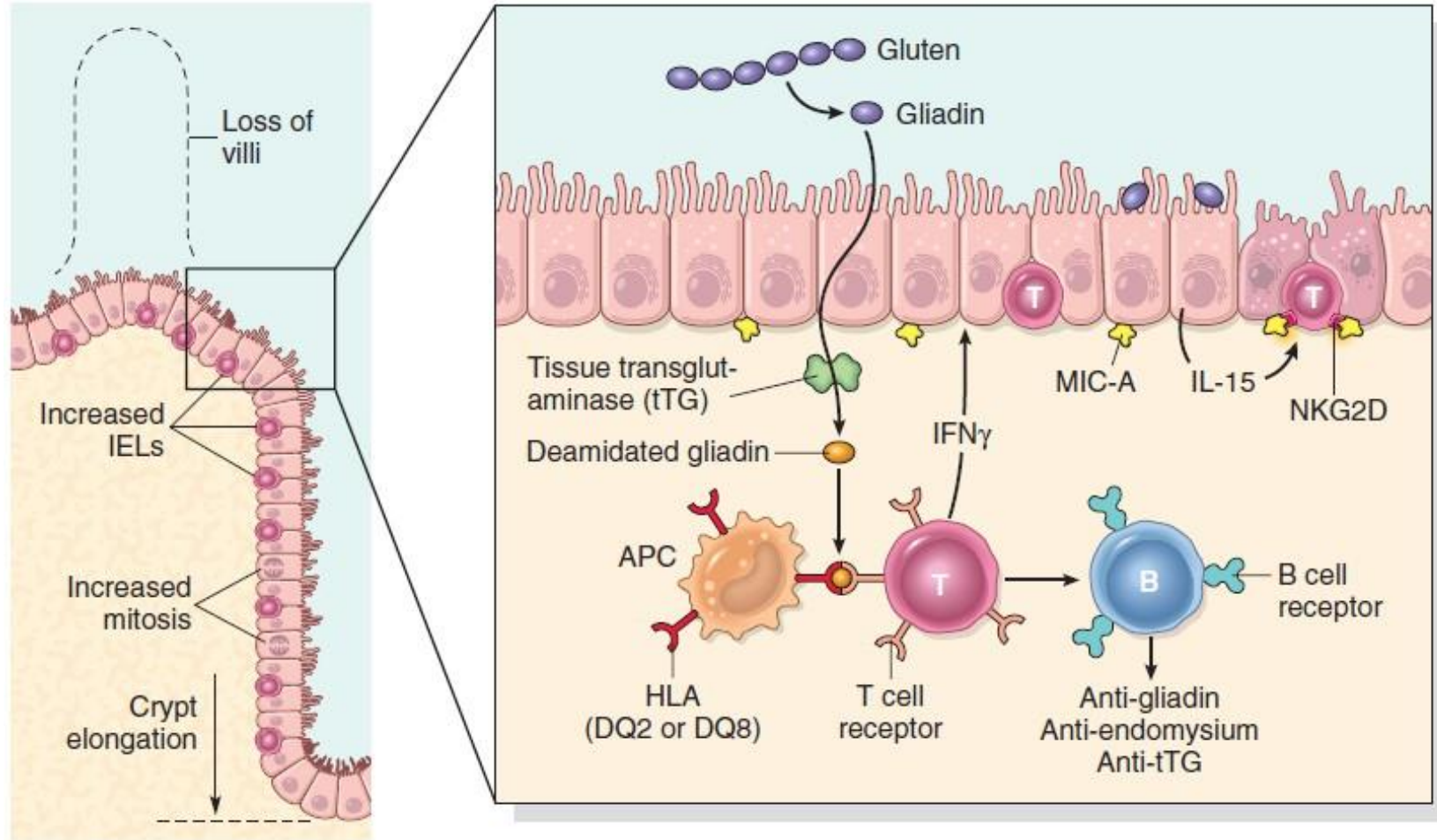
- ▶ Gluten >>> gliadin >>> react with HLA-DQ2 or HLA-DQ8 on antigen-presenting cells >>> CD4+ T cells activation >>> cytokines >>> tissue damage.

- ▶ Serology:

Anti- tissue transglutaminase antibodies

Anti-gliadin antibodies.

Anti -endomysial antibodies



# MORPHOLOGY

- ▶ Second portion of the duodenum or proximal jejunum.
- ▶ **Triad:** intraepithelial lymphocytosis (CD8+ T cells), crypt hyperplasia, and villous atrophy.
- ▶ Lamina propria: lymphocytes, plasma cells, eosinophils.....
- ▶ IEL & villous atrophy are not pathognomonic, seen in viral enteritis.
  
- ▶ Diagnosis: Clinical, histologic and serologic correlation.

**Normal**



**Celiac Disease**



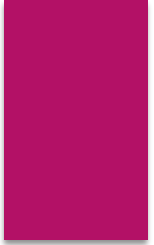
UCLA

# Clinical Features

- ▶ Children 6-24 months : classical or non classical symptoms
- ▶ Classical: Irritability, abdominal distention, anorexia, diarrhea, failure to thrive, weight loss, or muscle wasting
- ▶ Non-classical: abdominal pain, nausea, vomiting, bloating, or constipation.
- ▶ Blistering skin lesion, dermatitis herpetiformis, in 10% of Pnts.

# Dermatitis herpetiformis.



- 
- ▶ Adults (30-60 years)
  - ▶ Anemia: iron deficiency
  - ▶ B12 and folate deficiency: less common.
  - ▶ Diarrhea , bloating, and fatigue.
  - ▶ Missed diagnosis: Silent celiac or latent celiac.
  
  - ▶ Increased risk of enteropathy associated T cell lymphoma & Small intestinal adenocarcinoma

# Diagnosis:

## 1. Non invasive serologic tests:

### ▶ Most sensitive:

Anti tissue transglutaminase antibody, IgA

Anti deamidated gliadin antibodies, IgA & IgG

### ▶ Most specific, but less sensitive

Antiendomysial antibody.

## 2. Invasive tests: small bowel biopsy.

# Lactase (Disaccharidase) Deficiency

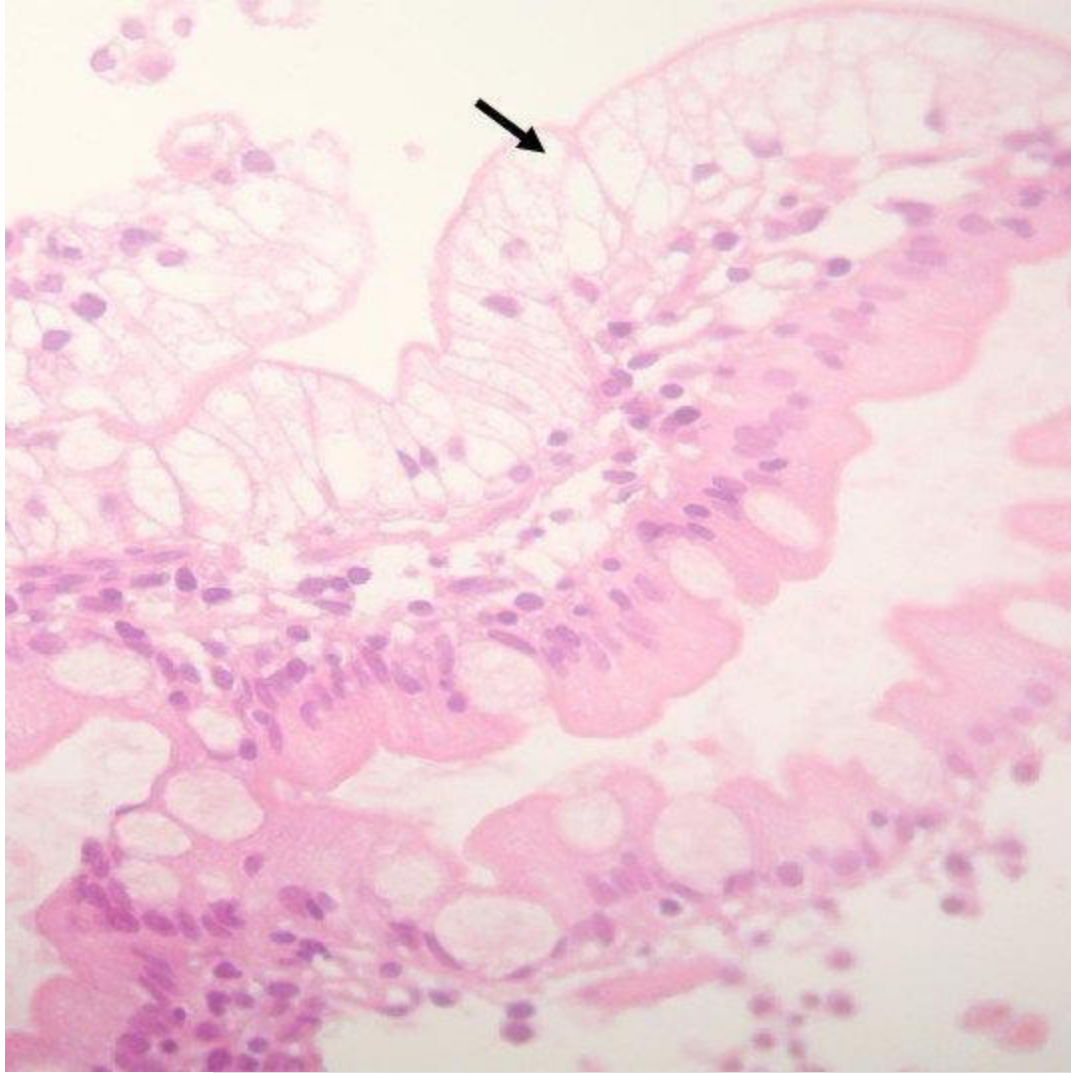
- ▶ Osmotic diarrhea
- ▶ Lactose remains in the gut lumen.
- ▶ Lactase found at apical brush border membrane
- ▶ Normal biopsy findings.
- ▶ Two types:

*Congenital* : AR, genetic mutation, rare, explosive diarrhea, watery, frothy stools & abdominal distention, after milk ingestion

*Acquired* : follow viral or bacterial enteritis, after childhood.

# Abetalipoproteinemia

- ▶ Autosomal recessive, rare.
- ▶ Infants w/ failure to thrive, diarrhea, and steatorrhea
- ▶ Lack of absorption of fat and fat soluble vitamins
  
- ▶ Inability to synthesize triglyceride-rich lipoproteins.
- ▶ Transepithelial transport defect of TG and FAs.
- ▶ Monoglycerides and triglycerides accumulate in epithelial cells.



Micrograph showing enterocytes with a clear cytoplasm (due to lipid accumulation) characteristic of abetalipoproteinemia.