



# GI PATHOLOGY

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# Small and Large Intestinal pathology, part 1

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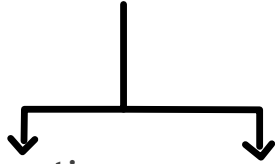
University of Jordan, School of medicine

# Diseases of the intestines

- \* The small intestine has three parts. The first part is called the duodenum. The jejunum is in the middle and the ileum is at the end
- \* large intestine is formed of caecum, ascending colon, transverse colon, descending colon, sigmoid and rectum
  - Intestinal obstruction
  - Vascular disorders
  - Malabsorptive diseases and infections
  - Inflammatory bowel disease.
  - Polyps and neoplastic diseases

} → surgical speciality's

# Intestinal obstruction like esophagus any hollow organ may get obstructed



- **Mechanical obstruction:** anything impedes the lumen will cause obstruction (like masses, tumors and polyps), there's physical blockage.

- **Intussusception**

- **Hernias.**

- **Adhesions.**

- **Volvulus**

80% of  
intestinal  
obstruction

- **Non-mechanical obstruction:(functional)**

there is no physical blockage, however, the bowels are not moving food through the digestive tract

- **Hirschsprung disease**

- **Neurological disorders.**

- **Drugs....etc**

- **Infarction** infarction: gangrenous necrosis of the intestine due to loss of blood supply (no contractions)
- **Tumors.**

- **Diverticulitis** Will be discussed later

# Clinical picture of intestinal obstruction. regardless of cause

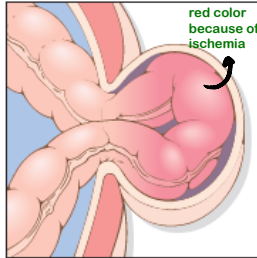
- discomfort, colicky pain → because the intestine will start to contract to increase the peristaltic movement in order to over compensate the obstruction
- Distention → <sup>نفخة</sup>proximal to the site of obstruction (no passage of stool or content) -like Achalasia of esophagus-
- Vomiting → if obstruction was severe enough
- Constipation → no passage of food, stool

• Acute or chronic. ↓  
Acute obstruction you will see the patient at emergency room, symptoms start suddenly

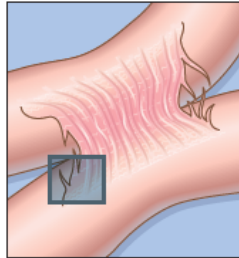
↓  
chronic obstruction you will see the patient at clinic, gradual symptoms of chronic constipation and distention

# 80% of mechanical obstructions

Herniation



Adhesions



**ADHESIONS:** between 2 bowel lobes  
result of previous inflammation at the site (fibrosis), previous perforation or surgery?  
it causes impedance to the content flow → obstruction

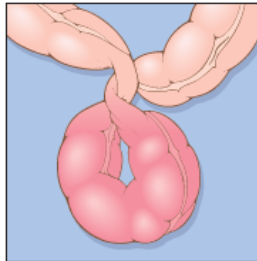
**HERNIATION:** when part of the bowel enters to defect area in the abdominal wall it becomes incarcerated there, which will decrease Venous drainage and blood supply  
may lead to ischemia and cause infraction, rupture, perforation

hernia itself isn't considered emergency while ischemic hernia is emergency (needs surgical intervention to save the bowel)

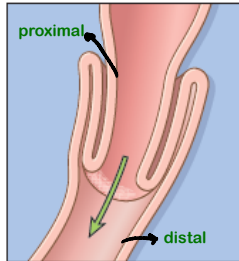
**VOLVULUS:** (twisting) ( بلف بولف على بعضها )

venous drainage stops  
engorged with blood (even blood flow stops)  
no drainage of blood → state of ischemia, infraction, perforation

\*surgical emergency  
in early stages → surgeon will untwist the bowel  
Advanced → ? surgeon will have to remove part of bowel



Volvulus



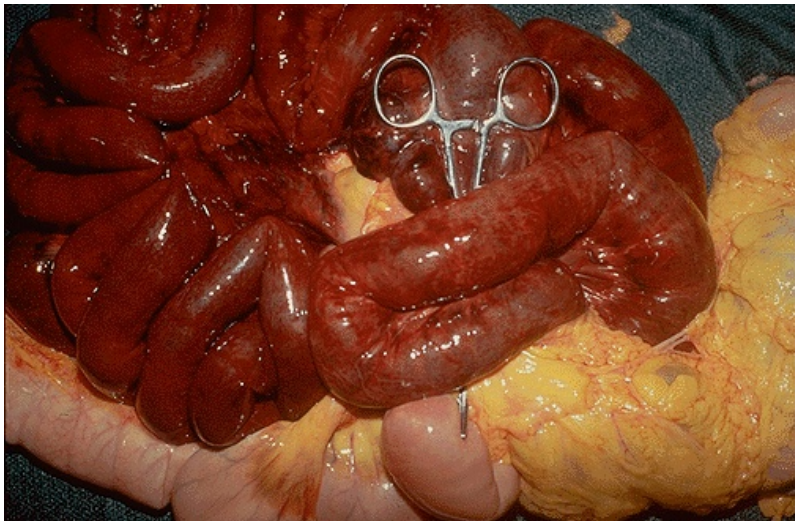
Intussusception

**INTUSSUSCEPTION:** when a proximal part of bowel enters in the distal more dilated part (it telescopes inside it like when you close a telescope)  
\*\*with each peristaltic movement there is propel of the bowel more distally  
\*\*one part of the bowel will be inserted in the other part  
\*\*the longer the intussusception area, the lesser reversibility  
توضيح من الدكتورة: زي كإنك بتدخل إصبع ال gloves بنفسه



# Bowel infarction

removing part of the bowel  
\*\*advanced stage of volvulus



for more clarification: <https://youtu.be/5KvJ3iJnCQk>

# Intussusception

**smaller** Segment of the intestine constricted by a wave of peristalsis, telescopes into the immediately distal segment, **that is bigger in diameter**

- 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.
  
- **any child < 2 years old came with obstruction symptoms you have to exclude intussusception first**



# Causes of intussusception

<2 → idiopathic

>2 → you search for cause (mostly cancer)

- < 2years : Idiopathic in most cases, no underlying cause

pre  
deposing  
factor → Peyer patches hyperplasia (rotavirus vaccine, viral infections) <sup>side effect of</sup> can act as leading point of intussusception

- 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) **means a blood stained stool**
- Pain.
- **irritability**
- **distended abdomen**

# Management depends on the stage (early, advanced)

•  
for early/  
short  
segment

contrast enemas is a test applied when intussusception is suspected by injecting a colored fluid or material in the rectum for diagnostic and therapeutic reasons

Contrast enemas (diagnostic and therapeutic) in uncomplicated idiopathic cases.

↳ the colored material appears on x-ray

↳ to give high pressure in order to reduce intussusception

•  
for advanced/  
longer  
segments

Surgery if complicated by infarction or if masses are the leading point.

during surgery

↳ manual reduction (in case of healthy bowel)

↳ resection (in case of infarcted bowel)

another disease that causes functional obstruction (not a mass)

# Hirschsprung Disease

neurological disease in the intrinsic nervous system of the bowel

**note:** The small and large intestine are mainly formed of these tissue types : mucosa, submucosa, muscular layer and serosa

present immediately after birth, may present later (depending on the degree)

↷ Congenital defect in colonic innervations

• (Congenital aganglionic megacolon) another name of hirschsprung disease

• More common in males

• More severe in females

• Risk increase in siblings.  
because it's a congenital disease

• Typical presentation:

▶ Later: Obstructive constipation.

• Neonatal failure to pass (meconium)

↷ the first stool passed by neonatal immediately after birth

this disease is marked by the absence of ganglionic cells in the submucosal or myenteric plexuses which may prevent peristaltic contraction [state of obstruction, the bowel proximal to this aganglionic segment will be distended bowel]

ganglionic cells exist in the submucosal and myenteric plexuses between muscles layers

biopsy from large intestine → no ganglionic cells → high probability of hirschsprung disease

# Pathogenesis

it's an innervation problem, ganglionic cells should migrate from the cecum to the rectum during embryogenesis, for some reasons this migration is interrupted at some point

والمرضى يحظه: and as doctor said:

interruption very proximal in the colon results in very long aganglionic segment

interruption in the sigmoid or upper rectum results in short aganglionic segment

where the migration of ganglionic cells stops, determine the length of the disease. and the longer the segment, the more severity of the disease

- 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. **these ganglionic cells are needed for peristaltic contractions**
- Mutations in RET:(in **more** familial cases) and 15% of sporadic
- Other genes and environmental factors play role.

# Morphology

- **the most distal part of bowel**  
(Rectum) always involved.
- Extent is variable.
- Most cases in rectosigmoid, **some all colon**
  
- **Macroscopic**
- Aganglionic region normal or contracted **not dilated**
- Proximal normal segment progressively dilated. **megacolon**
- ▶ **Diagnostic workup: barium enema, BIOPSY, microscopic.**

## modalities of diagnosis

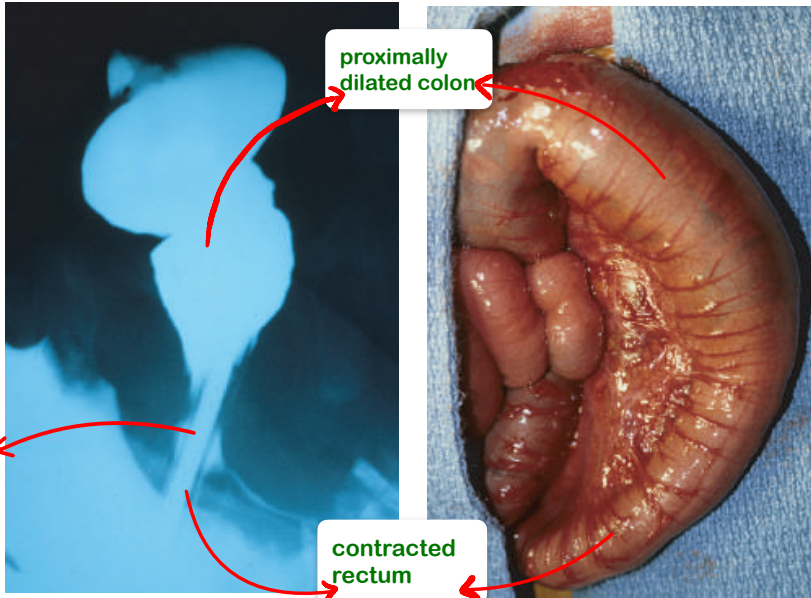
gold standard modality: biopsy (thick full biopsy from mucosa, submucosa and muscularis, otherwise it will be insufficient like if it was only mucosa we can't determine if there is ganglionic cells or not - must be taken from myenteric and submucosal plexuses)

barium enema, like barium swallow in achalasia, they inject barium through the anus then x-ray for the patient so we see dilated megacolon where enema builds up

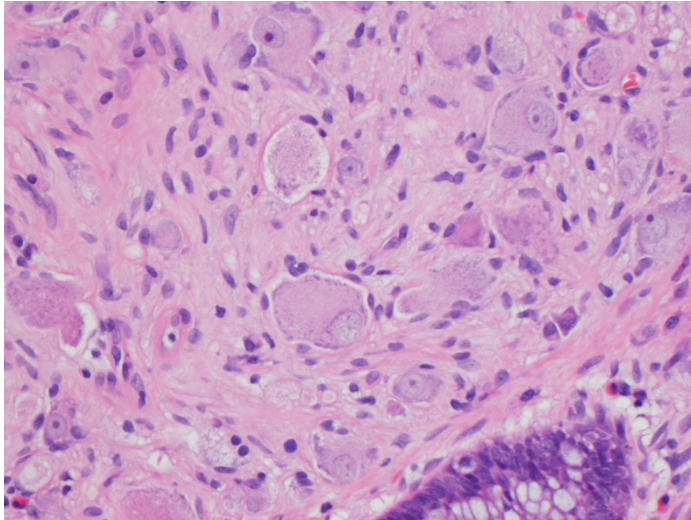
microscopic (histological evaluation)

barium enema

macroscopic appearance



# ganglion cells neurons



ganglionic cells which  
what we look for in  
suspected hirschsprung  
disease



# Complications

- Enterocolitis infection (bowel is distended and there's stagnation of stool → risk of bacterial overgrowth and infection)
- Fluid and electrolyte disturbances
- Perforation (bowel could be ruptured causing)
- Peritonitis

- **Treatment:** it's not easy surgery (more than step surgery)
- Surgical resection of aganglionic segment and anastomosis of normal segments.

they open the stroma through the abdomen to do resection to the aganglionic segment then -through second surgery- reanastomosis of the ganglionic area to the anal canal (patients can live near normal later on)

# VASCULAR DISORDERS OF BOWEL

- Ischemic Bowel Disease
- Hemorrhoids

# Hemorrhoids

like paresis in esophagus it's a dilated tortuous veins but in the anorectal area

- Dilated anal and perianal collateral vessels that connect the portal and caval venous systems.
- Predisposing factors: **underlying cause**

**chronic** Constipation and straining

- Venous stasis of pregnancy, **very common in pregnancy**
- Portal hypertension.

**There are 2 types of hemorrhoids:**

- **1)** External (below anorectal line) **2)** and internal (above anorectal line) hemorrhoids

veins so easy bleeding

- Thin -walled, dilated, submucosal vessels beneath anal or rectal mucosa.  
patient come with lower GI bleeding
- Symptoms: [most important representation (fresh blood)]
- Bleeding, pain, thrombosis and inflammation  
if it's complicated
- Treatment: depends on hemorrhoids extent
- Sclerotherapy, rubber band ligation, infrared coagulation. Hemorrhoidectomy.

v2

added → **(later: obstructive constipation)**  
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