
بسم الله الرحمن الرحيم

Constipation
(Medical Aspects)

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Anatomy of the anorectum

The rectum is 12-15 cm. long. It connects with the sigmoid colon by the rectosigmoid junction which is believed to have a high pressure zone and to act as a physiological sphincter.

The rectum connects with the anal canal by the anorectal angle which measures 80-100^{o} and which is caused by the puborectalis sling.

the anal canal is 4cm. long. It extends from the anorectal ring to the anal margin. Its proximal end corresponds to the level of the levator ani. It is embraced above by the puborectalis muscle and below by the external anal sphincter (EAS).

during rest, the anal canal is collapsed and the anus is reduced to a slit *(Shafik,1975).*

A schematic illustration showing the functional zones of the anorectum:

A: sacrum.

B: sacral portion of the rectum.

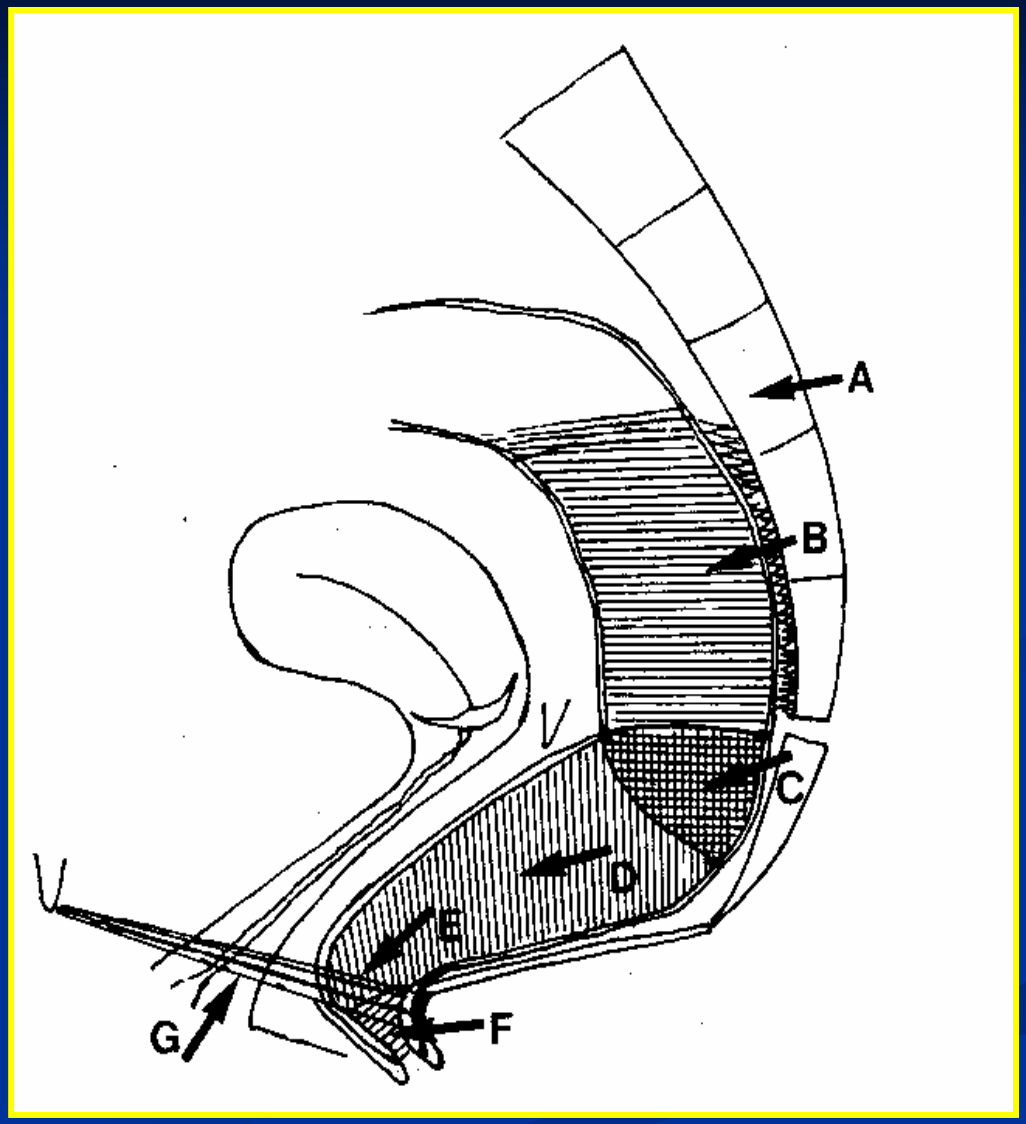
C: transitional zone.

D: ampullary portion of rectum.

E: anorectal junction (hiatus).

F: anal canal.

G: puborectalis muscle.



Innervation of the anorectum

- Myenteric plexus → motility.
- Submucous plexus → absorption and secretion.

- Excitatory neurotransmitters: mainly A.C and sub.P.
- Inhibitory neurotransmitters: mainly NO and VIP.

several neuro-modulators affect the actions of these neurotransmitters as 5-hydroxytryptamine (5-HT), and cholecystokinin (CCK), somatostatin and others *(Sun et al 2002).*

Mechanism of Defecation

- Mass contractions of left colon
- Mechanical stimulation of the rectum and pelvic floor muscles.
- Reflex activity of the anal sphincters
- Defecatory sensations evoked by rectal filling
- Voluntary response to the defecatory urge
- Post-defecatory reflexes *(Bayler, 2004).*

Defecatory urge

Most persons feel the urge if 60-100 ml of feces is present in the rectum. The maximal tolerable volume and pressure is 250-400 ml.

The rectal wall is supplied by autonomic innervation and is sensitive only to stretch and squeeze in contrast to the anal mucosa which is supplied by somatic innervation and responds to pain, touch and temperature.

Defecatory sampling

The process of fecal contact with the anal mucosa before actual entry of the fecal mass into the anal canal is referred to as "sampling". By sampling the anal canal can recognize the consistency of the oncoming fecal material and can differentiate solids and liquids from gases. This differentiation is important because gases can be expelled at any time and anywhere without much social embarrassment but solids and liquids are expelled only in toilets.

Voluntary suppression

Prolonged suppression leads to one of two consquences; either loss of the defecatory urge or forceful involuntary expulsion if the rectal pressure becomes too high. This particularly occurs in IBS due to diminished rectal compliance. Habitual suppression leads to irreversible dilatation of the rectum and increased compliance (megarectum). This is perhaps one of the commonest causes of constipation. If one resists the urge to expel gas, the urge will also subside within a short time. The gas will be absorbed and exhaled in the breath. This practice seems to be harmless.

Definition

- A perception of abnormal defecation that may include decreased frequency of bowel movements, a sensation of incomplete evacuation, painful defecation, straining or hard stools.
- The frequency of normal bowel movements is broad, ranging from 3 to 12 per week.
- The normal stool weight varies from 30 – 450 gm per motion.
- More common among women than men.

Pathogenesis of constipation

I. Defective fecal propulsion

1. Colonic Dysmotility
2. Colorectal Dysmotility
3. Whole gut Dysmotility

II. Defective fecal expulsion (Obstructed defecation).

1. Rectal dysfunction
2. Anal dysfunction
3. Pelvic floor dysfunction *(Abdel-Hamid, 2000)*

Aetiology

- Lifestyle.
- Medications.
- Structural abnormalities.
- Systemic disease.
- Causes of refractory constipation.

Lifestyle

- Low fiber.
- Inadequate fluids.
- Poor toilet habits.
- Inability to sit on toilet.
- Inadequate exercise.

Medications

- Anticholinergics
  - Antidepressants
  - Neuroleptic agents
  - Antihistamines
  - Antiparkinsonian drugs
- Antihypertensives
  - Calcium channel blockers
  - Clonidine
- Cation-containing agents
  - Iron supplements
  - Calcium supplements
  - Aluminum-containing antacids, sucralfate
- Opiates
  - Morphine
  - Codeine
  - Diphenoxylate

Structural abnormalities

- **Perianal disease**: fissure, thrombosed hemorrhoid
- **Obstructing colonic carcinoma**
- **Colonic stricture**: diverticular, radiation, ischemia.
- Idiopathic megarectum

Systemic disease

- **Metabolic and endocrine.**
  - Hypothyroidism
  - Hypercalcemia.
  - Chronic renal failure.
  - Diabetes mellitus
- **Neurologic disorders**
  - Spinal cord lesions.
  - Multiple sclerosis.
  - Parkinson's disease.
  - Hirschsprung's disease.
  - Autonomic neuropathy
  - Prior pelvic surgery with disruption of parasympathetics
- **Others**
  - Amyloidosis.
  - Dermatomyositis
  - Progressive systemic sclerosis.
  - Depression
  - Dementia.

Causes of refractory constipation

- **Slow colonic transit**
  - Idiopathic
  - Chronic intestinal pseudo-obstruction
- **Anorectal outlet disorders**
  - Rectocoele.
  - Rectal intussusception
  - Rectal prolapse
  - Perineal descent.
  - Anismus

Clinical approach and Diagnosis

- **HISTORY**
  - **Onset and course.**
    1. Age at onset.
    2. History of difficult labors, drug intake, or immobilization.
    3. Associated urinary trouble.
    4. Associated episodes of diarrhea **or incontinence.**
  - **Defecatory pattern**
    1. Defecatory urge, straining, manipulations, pain
    2. Fecal morphology
  - **Gastrointestinal symptoms**
    1. Abdominal pain.
    2. Recurrent diarrhea
  - **General symptoms**
    1. Symptoms of hypothyroidism
    2. Symptoms of diabetes mellitus, etc...

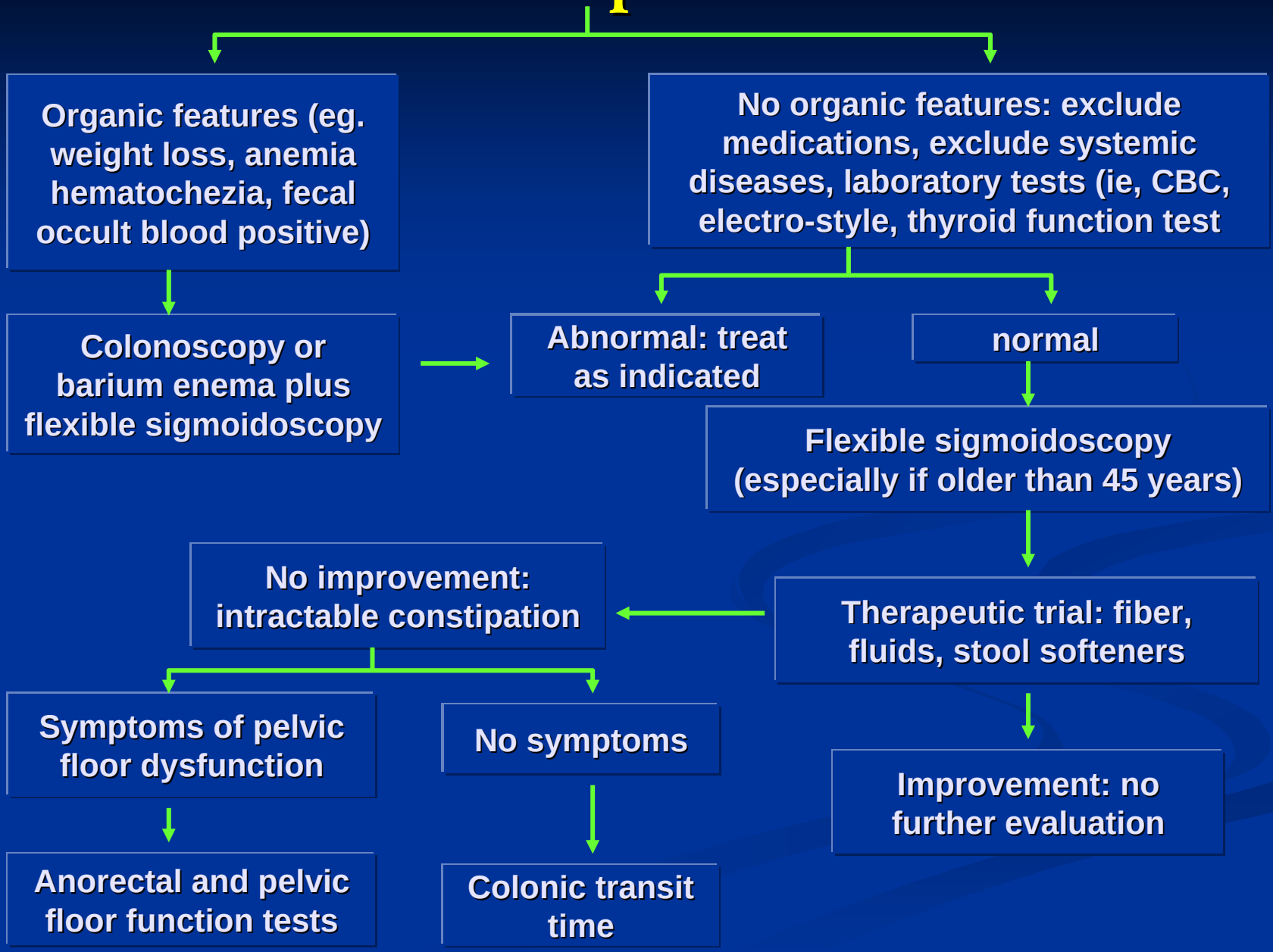
- **PHYSICAL EXAMINATION**
  - **Abdominal examination**
    1. Abdominal tympany.
    2. Colonic masses (fecal mass).
  - Examination of the rectum and the pelvic floor
    1. External anal sphincter (EAS)
    2. Perineal descent
    3. Visceral descent
    4. Rectal contents

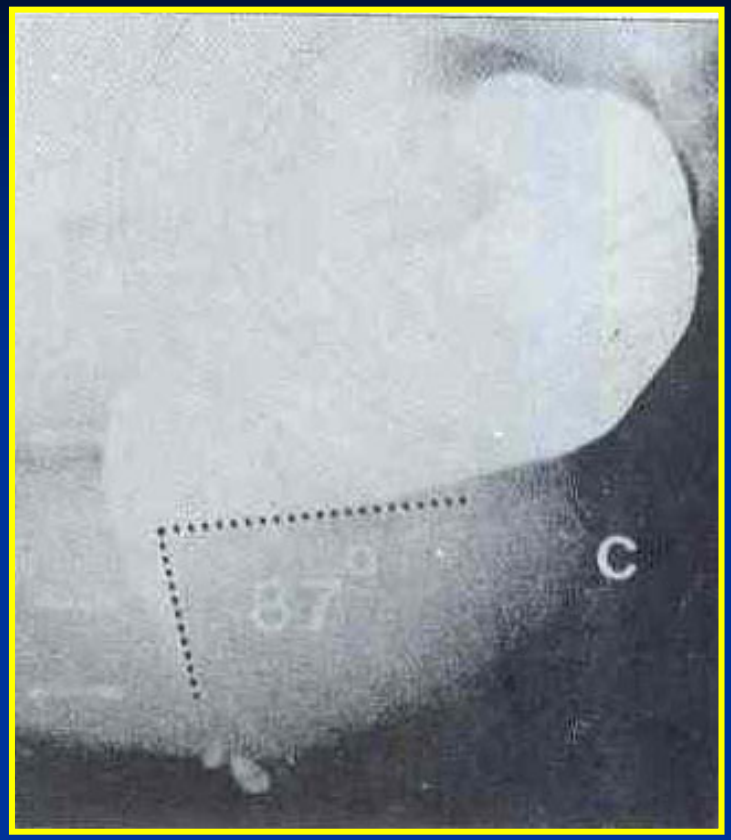
- **INVESTIGATIONS**
  - **Radiological studies**
    1. Barium enema
    2. Barium followthrough
    3. Colonic transit studies
    4. Defecography or evacuation proctography
  - **Rigid sigmoidoscopy and proctoscopy**
    1. Organic lesions.
    2. Rectal prolapse on straining.

- **Anorectal motility studies**
  1. Anorectal manometry.
  2. Sphincteric electromyography (EMG).
  3. Rectal sensitivity testing.
  4. Rectal expulsion test.

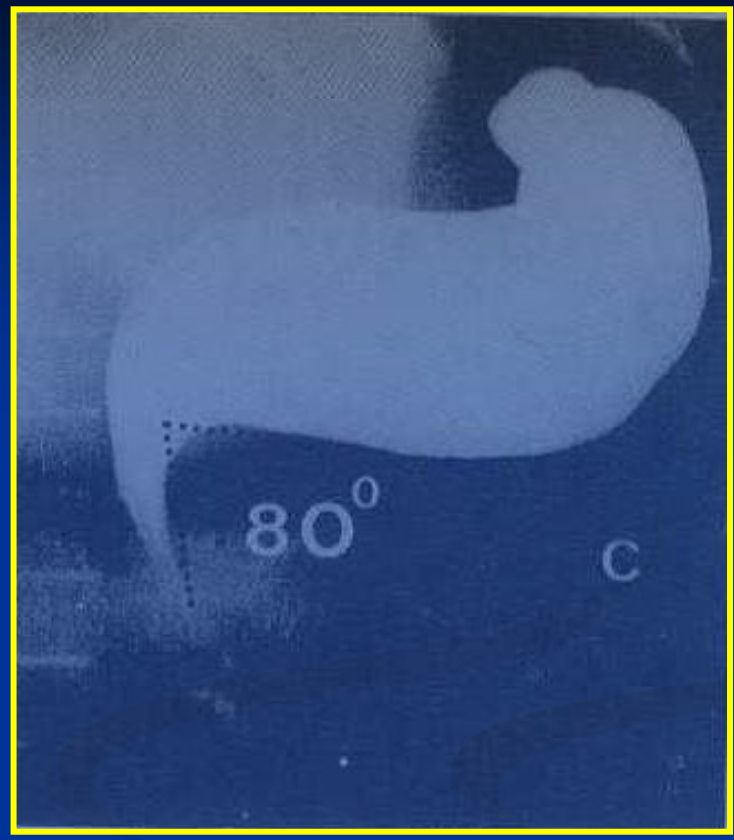
- **General metabolic and hormonal tests**
  1. Tests for hypothyroidism
  2. Tests for diabetes, etc...

Constipation





Normal defecogram. In the resting state.



Normal defecogram. The subject resists defecation by retaining or squeezing. The puborectal muscle is then extra powerfully contracted as a result of which the anorectal angle is smaller than in the resting state.

Normal defecogram. A healthy volunteer strains and the puborectal muscle and the levator ani muscle relax . As a result, the pelvic floor descends and the anorectal angle opens fully out.

Diagnostic criteria for the irritable bowel syndrome (Rome II consensus).

At least 12 weeks in the preceding 12 months of abdominal discomfort or pain that has two of these features:

- Relieved with defecation.
- Onset associated with a change in frequency of stool.
- Onset associated with change in form of stool.

Associated with these supportive symptoms:

- Fewer than three bowel movements a week.
- More than three bowel movements a day.
- Hard or lumpy stools.
- Loose or watery stools.
- Straining during a bowel movement.
- Urgency.
- Feeling of incomplete evacuation.
- Passing mucus during a bowel movement.
- Abdomenal fullness, bloating or swelling.

In IBS, the non-propulsive or the segmenting contractions are increased and retard colonic transit leading to a general increase in colonic motility but with slow transit.

There is also an increased rectal sensitivity in IBS. These patients, though constipated, go to the toilet several times a day often with unsatisfactory results. Their hypersensitive or irritable rectums are stimulated by minimal fecal materials that fail to stimulate a normal rectum. They often strain to evacuate an almost empty rectum.

Constipation in IBS is also attributed to another contributory factor related to the morphology of the stools. The rectum finds more difficulty in expelling the small fecal pellets of IBS than expelling normal- sized stools.

Treatment

A: Lifestyle

- Physical activity *(Tuteja et al. 2005)*
- Avoid medications
- Correct metabolic abnormalities.

B: Dietary modifications

- Ample amounts of liquids (at least 1500 ml/day).
- Regular meals.
- ↑dietary fibers between 20 and 30g/d: (NSP) wheat, raw, bran, fruits, vegetables, oats, corn and legumes *(Wiston and Messner, 2005).*

C: laxative

- Bulking agents (Bran).
- Unabsorbed sugars (Lactulose).
- Unabsorbed salts (Magnesium).
- Anthranoid laxatives (Senna, Aloe, Cascara).
- Polyphenolic compounds (Bisacodyl).
- Lubricants (Liquid paraffin).

D: Prokinetic drugs

- Dopamine receptor antagonists

  (Metochlopramide and domperidone).

- 5-hydroxytryptamine agonists

  (Tegaserod) *(Muller et al, 2005).*

- Cholecystokinin-1 antagonists

  (Dexloxiglumide) ***(Cremonini et al., 2005).***

E: Biofeedback.

(Behavioral therapy) it aims at teaching the patient how to relax his pelvic floor muscles in response to straining.

It is mainly indicated in cases of pelvic floor dyssynergia (anismus) satisfactory results were achieved in variable numbers of cases *(Croffie et al 2005)*


Thank
you