

Motility Disorders of the Gastrointestinal Tract

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Educational Goals

By the completion of the section on motility disorders of the GI tract you should know:

1. The clinical presentation and causes of delayed gastric emptying.
2. The causes of chronic constipation.
3. The symptom profile of irritable bowel syndrome (IBS), especially those symptoms that are suggestive of IBS vs. those suggestive of organic disease.

Key Words:

- anal manometry
- anismus
- antacids
- anticholinergics
- barium x-ray
- biliary dyskinesia
- chronic idiopathic intestinal pseudoobstruction
- colonic inertia
- constipation
- defogram
- diabetes
- fiber supplement
- gastric emptying
- gastric emptying scan
- gastric outlet obstruction
- gastroparesis
- Hirschprung's disease
- hypothyroidism
- infectious gastroenteritis
- irritable bowel syndrome
- lactase insufficiency
- Manning criteria
- marker study
- noncardiac chest pain
- nonulcer dyspepsia
- pelvic floor dysfunction
- phenothiazines
- prokinetic agents
- pyloric stenosis
- rectal biopsy
- scleroderma
- tricyclic antidepressants

Motility disorders of the GI tract are common problems that are often poorly understood. The etiology is often not defined, and the therapies are often nonspecific. I have selected a few of the most common or most important disorders that will be useful to understand.

A. **Delayed gastric emptying**, a commonly occurring disorder

1. Symptoms - bloating, nausea, even vomiting after meals. Classic symptom is vomiting undigested food one hour after eating. Usually not associated with abdominal pain.
2. Diagnosis is made by demonstrating delayed gastric emptying on a nuclear medicine - gastric emptying scan.
3. Differential diagnosis is:
 - a. Gastric outlet obstruction
 1. Pyloric stenosis due to chronic scarring from peptic ulcer disease.
 2. Extrinsic compression - most common is pancreatic cancer.
 3. Evaluate by endoscopy preferable to UGI (barium x-ray)
 4. Treatment is correction of obstructing problem, never prokinetic agents.
 - b. Gastroparesis (motility disorder) - consider after gastric outlet obstruction has been ruled out.
 1. Diabetic
 2. Idiopathic: may be "hypomotility" or "hypermotility" with incoordinated contractions
 3. Diagnosis is made by delayed emptying on scan and ruling out gastric outlet obstruction. More specific testing is not yet available.
 4. Treatment is prokinetic agents.

B. **Chronic idiopathic intestinal pseudoobstruction (CIIP)** - a rare disorder of motility of the small intestine. Can involve colon and stomach motility as well. Occurs in patients with

scleroderma or diabetes, or can be idiopathic. Clinically, can be confused with small bowel obstruction.

C. Chronic constipation

1. Definition - a significant change from ones stable bowel pattern
2. Etiologies (many causes, here are a few important ones):
 - a. Usually due to colonic inertia (hypomotility)
 - b. Medication related:

Antacids containing aluminum or calcium	Opiate analgesics
Anticholinergics	Monoamine oxidase inhibitors
Anticonvulsants	Phenothiazines
Diuretics	Parkinsonism drugs
Ganglionic blockers	Tricyclic antidepressants
Iron supplements	
 - c. Obstructing lesions such as colon cancer
 - d. Hypothyroidism
 - e. Hirschprung's disease - nonrelaxation of internal anal sphincter
 1. Rather rare disease
 2. Typically presents in early childhood, but can present later
 3. Diagnosis made by typical appearance on barium enema, demonstrating incomplete relaxation of the IAS on anal manometry, rectal biopsy
 4. Treatment is surgical (removing the narrow nonrelaxing part not the dilated actually normal colon).
 - f. Outlet obstruction due to pelvic floor dysfunction, such as failure to relax (or spasm of) the puborectalis muscle. Also called anismus, or puborectalis spasm, or pelvic floor dysfunction.
3. Evaluation constipation
 - a. Exclude obstruction lesions with barium enema or colonoscopy (if heme positive stool choose colonoscopy)
 - b. Review medications !!!
 - c. Exclude hypothyroidism
 - d. Anorectal manometry-essential for ruling out Hirschprung's disease. Helpful in evaluating for pelvic floor dysfunction.
 - e. Marker study (or other transit studies if available) to demonstrate the slow transit and to try to define the site of the hang up.

Marker study - eat 20 little plastic markers which are provided in a capsule in radiology. Then get serial flat plate of the abdomen x-rays. I usually get one x-ray about 1-2 hours after eating the capsule to confirm they've been eaten and then repeat x-rays on days 3,4&5.
 - f. Defogram-most useful in evaluating for outlet obstruction due to pelvic floor dysfunction
1. Treatment - correct underlying etiology if possible and find a bowel regimen that works.

D. Irritable bowel syndrome is a functional bowel disorder

1. Functional bowel disorders are defined as disorders for which no structural, biochemical or infectious etiology has been found. There are a variety of functional bowel disorders, the most important ones are:
 - irritable bowel syndrome
 - noncardiac chest pain
 - nonulcer dyspepsia
 - biliary dyskinesiaThey may be related, and may represent manifestations of similar underlying pathophysiological mechanisms, just affecting different parts of the bowel.
2. Epidemiology - very common disorders with worldwide distribution. Irritable bowel syndrome alone is the diagnosis in up to 50% of patients seeing a gastroenterologist. More prevalent among young women, but can affect any age both sexes.
3. Pathophysiological mechanism is not understood

- a. Probably a disorder of GI motility or visceral sensation.
 - b. Recent studies have suggested that infectious gastroenteritis may increase the likelihood that IBS will develop later in life.
 - c. Psychosocial factors can play an important role in determining which people with these symptoms seek medical attention.
 - d. Possible higher prevalence of previous physical or sexual abuse in patients (primarily women) with IBS.
4. Prognosis is generally excellent. The issue is dealing with the symptoms
 5. The symptoms of IBS are abdominal pain with altered bowel habits (diarrhea alternating with constipation, diarrhea that is usually intermittent or constipation). Altered bowel habits with no abdominal pain may be same syndrome. Constipation alone is considered a different disorder.
 6. Symptoms suggestive of IBS (Manning criteria) are:
 - a. Abdominal distension
 - b. Pain relief with bowel action
 - c. More frequent stools with the onset of pain
 - d. Looser stools with the onset of pain
 - e. Passage of mucus
 - f. Sensation of incomplete evacuation
 7. Suggested evaluation of patients with symptoms of IBS – The goal of this evaluation is to establish the diagnosis early, do appropriate evaluation to exclude other etiologies and to avoid unnecessary testing.
 - a. History
 1. Presence of typical symptoms for at least three months
 2. Identify Manning criteria (see above)
 - b. Exclude symptoms suggestive of organic disease:
 1. visible or occult blood in the stool
 2. weight loss
 3. fever

1-3 are never explained by IBS alone, must evaluate for other causes

 4. pain awakening patient from sleep
 5. pain that interferes with normal sleep patterns
 6. diarrhea that awakens patient from sleep
 - c. Dietary history to exclude lactase insufficiency or excessive use of sorbitol or fructose
 - d. Review medications for gastrointestinal side effects
 - e. Identify psychosocial factors precipitating presentation
 - f. Consider depression or panic disorders - may have presentation similar to IBS
 - g. Physical Exam should be unremarkable; significant findings require further evaluation
 - h. Laboratory examination
 1. Complete blood count, erythrocyte sedimentation rate, chemistry panel
 2. Flexible sigmoidoscopy; colonoscopy if age > 50 or age >40 plus family history of colorectal neoplasm
 3. If diarrhea-predominant:
 - examination of stool for ova and parasites, fecal leukocytes, excessive fat
 - thyroid function tests
 - sigmoidoscopic biopsies
 8. Treatment
 - a. Establish a therapeutic physician-patient relationship
 - b. Trial of fiber supplement
 - c. Trial of one of a variety of medications. Focus on treating the predominant complaint.

Suggested Reading:

1. Lynn RB and Friedman LS. Current Concepts: Irritable bowel syndrome. N Engl J Med 329:1940-1945, 1993.

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3. Owyang, C. Irritable Bowel Syndrome. In Harrison's Textbook of Medicine, 16th edition, eds. D.L. Kasper et. al. Chap. 277.
4. Mertz HR. Drug therapy: irritable bowel syndrome. N Engl J Med 2003;349:2136-46