Gastrointestinal Motility
Questions, Answers and Critiques

1. Which of the following statements regarding the UES is false?
   A. The UES is attached to the larynx, obligating it to move in unison with the larynx during swallowing
   B. Zenker's diverticula form proximal to the UES
   C. A cricopharyngeal bar is thought to be the precursor of a Zenker's diverticulum
   D. UES relaxation is uncoordinated with the pharyngeal contraction in Zenker's diverticula patients
   E. The muscular elements of the UES are striated muscle

   The recommended response is D.

The UES is a highly asymmetric structure with the posterior and lateral walls composed mainly of the cricopharyngeus muscle that attaches in a C configuration to the lateral aspects of the cricoid plate. Thus, the sphincter has a slit-like appearance with the anterior wall being cartilaginous, is entirely composed of striated muscle, and is obliged to move with the larynx during swallow-related movement. There has been no demonstration of any contractile abnormality with either a cricopharyngeal bar or a Zenker's diverticulum. Rather, the cricopharyngeus sustains degenerative changes with resultant fibrosis leading to reduced compliance during swallowing and the appearance of a cricopharyngeal bar (Figure 7). The presumed etiology of a Zenker's diverticulum is related to the subsequent pressure stresses on the pharyngeal wall proximal to the cricopharyngeus.

2. The nerve network situated between the longitudinal and circular layers of the muscularis propria is named:
   A. Meissner's plexus
   B. Laimer's plexus
   C. Auerbach's plexus
   D. The triangular plexus
   E. The brachial plexus

   The recommended response is C.

Auerbach's plexus, also known as the myenteric plexus. Meissner's plexus is the submucosal plexus; the others are not enteric structures.

3. The gastric sling and clasp fibers:
   A. Constitute the inferior aspect of the LES
   B. Suspend the stomach from the diaphragm
   C. Maintain the angle of His but do not function as a sphincter
   D. Oppose each other at the angulus incissura
E. Are continuous with the circular muscle layer of the esophageal muscularis propria

The recommended response is A.

The clasp and sling fibers constitute the inferior (gastric) portion of the LES, which in the process, also maintains the angle of His. The esophagus is suspended from the diaphragm by the phrenoesophageal ligament and the incisura angularis divides the body and antrum of the stomach. Although part of the sphincteric mechanism, the clasp and sling fibers are a third, incomplete, muscular layer of the stomach situated between the equivalent of the longitudinal and circular muscle layers of the esophageal muscularis propria.

4. The mechanism by which a peristaltic contraction is propagated in the smooth muscle part of the tubular esophagus is:
   
   A. A myogenic mechanism related to progressively more negative membrane potentials toward the distal esophagus
   B. A result of sequential activation of the myenteric plexus by the vagus nerves
   C. A result of sequential activation of the musculature by the vagus nerves
   D. A function of the balance between inhibitory and excitatory myenteric plexus neurons at each esophageal locus
   E. Under complete control of the CNS at the level of the medulla

The recommended response is D.

The sequencing of peristalsis is a result of increasing dominance of inhibitory neurons toward the distal esophagus with the effect of delaying the excitation.

By experimentally eliminating the influence of the inhibitory neurons, the result is a simultaneous contraction. Removing the vagal influences (and hence CNS influences) altogether does not change the propagation of peristalsis, though it does prevent deglutition-induced primary esophageal peristalsis.

5. All of the following are characteristic of idiopathic achalasia except:
   
   A. Retained food in the esophagus during endoscopy
   B. Impaired LES relaxation during manometry
   C. Aperistalsis of the distal esophagus
   D. Resistance to the passage of an endoscope into the stomach
   E. Rarely found in individuals less than 18 years old

The recommended response is D.

Most cases of achalasia are associated with esophageal dilatation but in early achalasia or with vigorous achalasia, this is often not the case. Finding food within the esophagus (and stomach) is typical in achalasia when there is esophageal dilatation. It is for this reason that manometry is a more sensitive means of detecting the disease. The essential
manometric features of achalasia are impaired LES relaxation and aperistalsis, although there may well be non-peristaltic contractility in the esophagus (Figure 5, Table 2). In idiopathic achalasia, there should be minimal resistance to passage of an endoscope because, although the LES does not relax normally, it has a contractile pressure low enough so that it is easily overcome. If there is more than the most minimal resistance, this should raise a red flag, suggesting the presence of pseudoachalasia or secondary achalasia, which is usually a consequence of malignant infiltration of the esophagogastric junction (most commonly caused by a malignancy of the gastric cardia). Achalasia is equally common in men and women and equally likely to occur in each decade of life.


6. A 40-year-old woman with intermittent heartburn and dysphagia to liquids and solids is seen in consultation. Review of systems reveals she has occasional arthralgias and Raynaud's phenomenon. The esophageal manometry in this patient would be characterized by:
   A. Hypertensive LES with normal esophageal peristalsis
   B. Hypertensive EUS with incomplete relaxation
   C. Hypotensive LES and aperistalsis in esophageal body
   D. Increased frequency of transient LES relaxation
   E. Normal peristalsis in the distal smooth muscle portion of the esophageal body

The recommended response is C.

In scleroderma of the esophagus, collagenous deposits in the smooth muscle of the LES eventually prevent the smooth muscle from contracting and result in hypotensive LES and aperistalsis in the esophageal body. The aperistalsis in the esophageal body results from both loss of neural elements in the esophageal wall as well as loss of smooth muscle and contractility of the esophageal wall. In scleroderma, the striated muscle function in the proximal esophageal body maintains normal contractility. Thus, esophageal dysphagia resulting from scleroderma can involve both decreased peristalsis in the esophageal body and various degrees of peptic stricture in the LES area due to gastroesophageal acid reflux. The best option is C.


7. During the ingestion of food, the initial motility response of the stomach is:
   A. Relaxation of the LES
   B. Inhibition of the pyloric sphincter
   C. Relaxation of the fundus and antrum
   D. Initiation of the MMC
   E. Relaxation of the colonic tone

The recommended response is C.
The initial motility response of the stomach to the ingestion of food is relaxation of the fundus. This is a vagal-mediated relaxation of the muscle of the fundus to accommodate the volume of ingested food and avoid increased intragastric pressure and excess distention of the fundic muscle. The LES relaxes in response to a swallow, but this is an esophageal response rather than a stomach response. The antrum of the stomach does not dilate, but produces peristaltic contractions that triturate or mix the ingested food with acid and pepsin. The pyloric sphincter does not contract immediately after ingestion of food but it may relax or contract later after ingestion depending upon the fat content of the food and whether more mixing is needed before emptying occurs. Colonic tone increases (rather than relaxing) upon food ingestion.

8. Gastric peristaltic contractions occur normally at a rate of 3 per minute, due to:
   A. Vagal excitatory innervation
   B. Gastric slow waves
   C. Antroduodenal contraction and coordination
   D. Duodenal pacemaker activity
   E. Rhythmic pyloric contractions

The recommended response is B.

Gastric peristaltic contractions occur at a rate of 3 per minute because the gastric slow waves occur at 3 cpm. Gastric slow waves are also called pacesetter potentials or electrical control activity. These electrical waves set the timing and the propagation velocity of the peristaltic contractions of the stomach. Action potentials and plateau potentials are the electrical correlate of circular muscle contractions. Antroduodenal coordination occurs with the normal emptying of the stomach but does not control the rate of contraction. The pylorus contracts in synchrony with or independently from the antrum and is not responsible for the frequency of gastric contractions. Finally, the fundus is electrically silent and does not have rhythmic electrical pacemaker activity, and the duodenal pacing does not determine the slow wave frequency of the stomach.


9. Which of the following factors promotes gastric emptying?
   A. Tachygastria
   B. High lipid content of meal
   C. High fibrous content of meal
   D. Hyperosmolality of meal
   E. Increased vagal nerve efferent activity

The recommended response is E.
Of the factors listed in this question, only vagal nerve activity would increase gastric emptying rates. Increased vagal efferent activity releases acetylcholine from the postganglionic neurons and increases gastric peristaltic contractions. Vagotomy decreases gastric emptying by decreasing contractility of the antrum. However, a number of factors clearly decrease gastric emptying and they include: high fat content of the meal, which releases cholecystokinin; increased fibrous content of the meal, which stimulates prolonged mixing to prepare the content for emptying; hyperosmolality of the meal, which stimulates duodenal receptors to delay gastric emptying; and tachygastria, a gastric dysrhythmia associated with poor antral contractility.


10. All of the following physiological defects have been described in patients with IBS without fibromyalgia except:
   A. Increased colonic motility in response to a meal
   B. Prolonged propagated contractions in the small and large intestine
   C. Increased visceral sensitivity to rectosigmoid balloon distension
   D. Increased somatic sensitivity to tactile and thermal stimuli
   E. Altered CNS activation in response to bowel stimuli as measured by PET and functional MRI scanning

The recommended response is D.

A number of both psychologic and physiologic abnormalities have been described in patients with IBS. Present understanding of the basis of IBS has shifted away from motility being the cause to motility disturbances being secondary phenomena. Visceral hypersensitivity is demonstrated in two-thirds of patients with IBS. Interestingly, somatic hypersensitivity has not been found, at least in some studies.


11. Features common to both Hirschsprung's disease and idiopathic achalasia include all of the following except:
   A. Small bowel manometry demonstrates abnormalities supporting a generalized motility disorder
   B. Defective neurally mediated inhibition of a smooth muscle sphincter
   C. Absence of nitric oxide neurons within the myenteric plexus that normally innervate the sphincter
   D. Radiographs demonstrate dilatation of the GI tract proximal to the diseased segment
E. Primarily a neuropathic rather than myopathic motility disorder

The recommended response is A.

Achalasia and Hirschsprung's disease have a number of similarities. The pathogenesis of both disorders involves loss of neurons, predominantly inhibitory, nitric oxide containing ones, from the myenteric plexus. As such, both are neuropathic motility disorders that manifest with failed relaxation of a tonically contracted sphincter. Achalasia is an acquired disorder and Hirschsprung's is congenital. Small-bowel dysmotility is not a typical feature of either disorder.

12. Select the true statement regarding the MMC.
   A. The MMC cycles every 5 minutes in the fed state.
   B. The MMC is involved with the clearance of retained food and indigestible objects in the digestive tract during the fasting state.
   C. The MMC is the dominant motility pattern in the fed state and is responsible for the mixing function of the small bowel.
   D. The MMC typically originates in the oropharynx and continues through to the anorectum.

The recommended response is B.

The MMC is a series of contractions that occur in the antrum and small bowel during fasting. The most prominent aspect of the MMC is the rhythmic burst of contractions that last from 4 to 10 minutes and migrate from the antrum to the ileum, a migration that takes almost 90 to 120 minutes, and is then followed by another sequence of migrating contractions that begin in the antrum. This cyclical burst of contractions is Phase III of the MMC. After the Phase III contractions cease, the bowel becomes quiescent and is called Phase I. Phase II is a period of 60 to 100 minutes, during which sporadic contractions occur with increasing frequency in the small intestine. Phase III moves residual undigestible materials from the stomach and small bowel into the distal small bowel and proximal colon during fasting. Thus, the MMC is characterized by its occurrence during fasting, not eating. The MMC is not associated with contractile activity of the colon and the characteristic Phase III occurs every 90 to 120 minutes, not every 9 to 12 hours. Finally, the MMC does not involve the rectosigmoid colon.


13. A 35-year-old woman with a 20-year history of diabetes presents with nausea, vomiting, solid food intolerance and weight loss of 14 lb in the past year. She reports often vomiting food eaten 1 or 2 days previously. She has hyperglycemia (glucose 145mg/dL), glycosylated Hb 7.5%, proteinuria (4 g/24 hours), and serum albumen 2.2 g/dL total cholesterol 580mg/dL and creatinine 1.5mg/dL. The most likely diagnosis is:
   A. Emesis secondary to uremia.
   B. Diabetic gastroparesis with malnutrition
C. Diabetic gastroparesis with nephrotic syndrome
D. Chronic pancreatitis and malnutrition secondary to hyperlipidemia
E. H. pylori infection without ulceration

The recommended response is C.

The patient has the classical symptoms of gastroparesis with a long standing history of diabetes and related complications, such as nephrotic syndrome. Several clinical series document the association of retinopathy, nephropathy and neuropathy with diabetic gastroparesis. However, delayed gastric emptying also occurs with type II diabetes. Associated risk factors include vagal neuropathy, hyperglycemia, and effects of medications including exenatide used for postprandial hyperglycemia.

14. In the patient described in question 13, upper gastrointestinal endoscopy shows the presence of retained undigested food, and no evidence of ulceration, or pyloric obstruction. CLO test on a gastric mucosal sample is positive. The most appropriate test to assess the cause of the vomiting is:

A. No tests, but eradication of H. pylori and review after 6 weeks
B. Gastric emptying test for solids or solids and liquids
C. Brain MRI including special “Cuts” to visualize vagal nuclei
D. CCK-secretin stimulated measurement of pancreatic exocrine function
E. Antropyloroduodenal manometry or, if unavailable, autonomic function test and surface electrogastrography

The recommended response is B.

Pancreatic function and brain imaging are not indicated based on the clinical history. Autonomic reflex screen and EGG would provide corroborative evidence of a disturbance in neural control of gastric function. Manometry is invasive and only available at specialized centers; it provides detailed physiological data, but does not necessarily assess severity of the gastroparesis or change patient’s management. Gastric emptying measurement appraises the severity of the gastric stasis and helps guide nutritional and pharmacological management.


15. A 48-year-old male patient with a 25-year history of diabetes presents with a 2-year history of chronic diarrhea: watery to loose, occasionally nocturnal, no blood, no mucus, rarely floats or contains undigested food. He denies incontinence, and diarrhea did not improve while he was given a broad spectrum antibiotic for a chest infection. Abdominal and rectal exams are normal. His chart includes his HLA haplotype (A1B8). His most likely diagnosis is:

A. Celiac disease
B. Chronic pancreatic insufficiency
C. Diabetic diarrhea
D. Bacterial overgrowth
E. Pudendal neuropathy secondary to longstanding diabetes

The recommended response is C.

The most likely is diarrhea due to diabetes, with no associated complications such as celiac sprue, bacterial overgrowth, or pancreatic insufficiency. A large proportion of
patients with type I diabetes and celiac disease have HLA-B8 haplotype.


16. A 32-year-old woman presents with constipation since she was in her mid-teens. The problem started in high school, was worse in college (where she lived in a dorm), and is now so severe that she has to spend 30 minutes per day trying to have a bowel movement, has a spontaneous bowel movement only once per 14 days, needs to digitate the rectum to facilitate passage of stool, or has to take a PEG preparation in high volume to “flush” her system. She denies any sexual or emotional abuse. She has not had any pelvic surgery or vaginal deliveries.

On examination, what do you NOT expect to find:

A. Palpable masses from stool in the cecum and sigmoid colon
B. High anal sphincter tone at rest
C. Normal or high anal squeeze pressures
D. Perineal descent 5cm on straining
E. Tightness and tenderness of the puborectalis muscle posteriorly on digital examination of the rectum

The recommended response is D.

All the features described are typical of the patient’s diagnosis of an evacuation disorder secondary to puborectalis and anal sphincter spasm, except for the excessive perineal descent (normal 1-4 cm). With puborectalis spasm, perineal descent is typically <1.5 cm. Excessive perineal descent is a feature of descending perineum syndrome which is a cause of constipation in older, typically multiparous women.


17. A 65-year-old male who weighs 300 lb and underwent total hip arthroplasty for DJD of the right hip 3 days ago, complains of significant bloating, failure to pass gas, and failure to have a bowel movement for 5 days. He has discomfort but denies crampy abdominal pain. His last suit trousers were 43 inch waist. He is taking no antihypertensive medications; the surgery was performed under spinal anesthesia, and he is presently slowly tapering morphine analgesia. The abdomen is markedly distended with a circumference of 50 inches. Bowel sounds are absent.

The most likely diagnosis is:

A. Colon cancer
B. Diverticular stricture
C. Acute colonic pseudo-obstruction
D. Opiate induced constipation
E. Peritonitis

The recommended response is C.

While opiates are contributing to the diagnosis, the most likely diagnosis is a multifactorial acute colonic pseudo-obstruction, a known complication after orthopedic procedures including those performed under spinal anesthesia. However, treatment should start with avoidance or stopping agents that interfere with gastrointestinal motility.
18. The morphine was stopped. The next morning, the patient in 5-18 had an abdominal radiograph. There was colonic gas down to the rectum, dilatation of the entire colon and a cecal diameter of 16 cm. The total white count is $8.3 \times 10^9/L$ with normal differential. The physical examination findings are unchanged. The orthopedic surgeons would like the patient confined to bed, preferably on his back. The most appropriate next management is:

A. Transfer the patient to the endoscopy unit for immediate colonoscopic decompression and placement of a large bore red rubber catheter

B. Emergency endoscopy on the orthopedic ward, keeping the patient on his back while doing an unprepared colonoscopic decompression and placement of soft tube for decompression over the next 24 hours

C. Cardiac and blood pressure monitoring with 1.0 mg neostigmine i.v.

D. Percutaneous cecostomy in the radiology suite

E. A cocktail of antibiotics and probiotics to change the colonic flora

The recommended response is C.

A trial of neostigmine is indicated before any decompressive procedure. The patient should also have daily abdominal examination, radiograph and white count to assess progress and identify any signs of peritoneal irritation or viscus perforation. Monitoring is essential, especially in the elderly, as the anticholinesterase effect of neostigmine can result in bradycardia. If the patient becomes hypotensive, atropine should be used to reverse the effect of neostigmine.


19. A 62-year-old male has lost 15 kg in the last 6 months, without dieting. He has chronic nausea of 3 months’ duration, aggravated after meals. He gives a 30-pack per year history of smoking. Hematology and chemistry group are unremarkable, except for serum albumen of 3.0 g/dL with no proteinuria. Chest x-ray is reported negative. CT abdomen is negative. The most likely diagnosis is:

A. Idiopathic gastroparesis

B. Chronic idiopathic intestinal pseudo-obstruction

C. Amyloidosis

D. Paraneoplastic pseudo-obstruction

E. Nonulcer dyspepsia

The recommended response is D.

The heavy smoking and significant weight loss are worrisome features suggestive of
paraneoplastic pseudo-obstruction. The most likely underlying malignancy is small cell lung cancer. Rarer associations are carcinoid and ovarian tumors. A blood test (antineuronal nuclear antibody) can be used to screen for the paraneoplastic syndrome. Mediastinal CT may be necessary, as the small cell lung cancer may not be visible on a chest radiograph.


20. A 38-year-old woman with 4 prior vaginal deliveries and episiotomies and with a past history of cold hands that turn intensely blue and painful in cold water presents with diarrhea, foul smelling floating stools, and occasional nocturnal stool incontinence. She denies difficulty swallowing. X-rays of her hands show calcifications. Rectal examination: normal anal squeeze pressure. The most likely diagnosis is:

A. Hyperparathyroidism and malabsorption  
B. Celiac disease  
C. Postpartum external anal sphincter damage  
D. Progressive systemic sclerosis  
E. Crohn’s disease with small joint arthropathy

The recommended response is D. 

The clinical features suggest bacterial overgrowth and internal anal sphincter weakness due to scleroderma. The normal anal squeeze pressure suggests normal external sphincter, unlikely to be associated with partum injury. About 5% of patients with gut scleroderma do not have esophageal involvement. In this patient, the peripheral manifestations and any positive serology will obviate the need for gastrointestinal manometry. If there is dilation of the gut (esophagus, small bowel) on x-ray, no further test is usually needed.

21. The patient in question 20 underwent small bowel examination which showed multiple diverticulosis, dilated loops, packing of valvulae conniventes in some segments. She was treated with daily clindamycin for 4 weeks, and the diarrhea stopped for 3 weeks. She was admitted with 3 days of blood diarrhea, temperature of 104° F, diffuse abdominal tenderness. The patient underwent colonoscopy. The most likely diagnosis is:

A. Amoebic dysentery  
B. Clostridium difficile-induced pseudomembranous colitis
22. A 38-year-old man reports with longstanding constipation and marked abdominal distension. He reports that his father and 2 of 4 elder siblings have had their thyroids removed for a problem that runs in the family. On examination, blood pressure is 230/120 and, after he gets over anxiety associated with being in the doctor’s office, the pressure is measured at 140/90. The abdomen is grossly distended, tympanitic and non-tender. The most likely diagnosis is:

A. Familial goiter, hypothyroidism and constipation
B. Medullary carcinoma of thyroid and megacolon
C. Multiple endocrine neoplasia type IIA
D. Multiple endocrine neoplasia type IIB
E. Familial thyrotoxicosis

The recommended response is D.

The patient has MEN IIB and should have colon evaluation, serum calcitonin, urinary metanephrines, ultrasound of thyroid and adrenal glands since 100% of patients develop medullary carcinoma of the thyroid and about 60% develop phaeochromocytome.

23. An 18-year-old freshman in college presents with “reflux” of food unresponsive to a proton pump inhibitor taken at full dose t.i.d. The problem started during her first semester in college; she is 5 ft. 4 in. tall and weighs 170 lb. Her roommate is a junior who is a cheerleader for the college. The patient denies heartburn at night and complains that food comes up, almost without any antecedent nausea or retching. Your surgical colleague wants to offer her a once-and-for-all operation for reflux. She has lost 14 lb. Optimal management is:

A. Full fundoplication
B. Loose fundoplication (e.g., Toupet procedure) to avoid postoperative dysphagia
C. Referral to a psychologist for behavioral therapy
D. A prokinetic (e.g., tegaserod 6 mg) before each meal
E. Partial gastrectomy with Roux-Y reconstruction to avoid bile reflux gastritis.

The recommended response is C.

The history is highly suggestive of rumination syndrome due to social pressures. Behavioral therapy such as teaching postcibal diaphragmatic breathing is indicated. Fundoplication should be avoided at all costs. It stops the food regurgitation, but replaces that symptom with severe nausea, upper abdominal pain, gas, and bloating with inability to belch.


24. A 24-year-old male presents with severe malnutrition, known small bowel diverticulosis, prior surgeries for intra-abdominal abscesses around perforated diverticula. Pupillary reaction to light is absent, and he has lateral rectus palsy in both eyes. Any physical exercise results in severe skeletal muscle cramps and pain. He has a past history of lactic acidosis and seizures in childhood. The most likely diagnosis is:

A. Mitochondrial cytopathy
B. Systemic sclerosis
C. Jejunal diverticulosis (idiopathic) with malnutrition
D. Polymyositis with gastrointestinal involvement
E. Duchenne dystrophy with gastrointestinal involvement

The recommended response is A.

The patient has mitochondrial cytopathy with multiple organs affected including GI, skeletal muscle, external ophthalmoplegia, encephalopathy. This is a genetic disorder; screening tests include searching for acidosis (lactate, pyruvate), skeletal muscle injury, elevated cPK (ragged red fibers on biopsy), and mitochondrial DNA test. Genetic counseling is required.

25. A 45-year-old woman presents for an evaluation of progressive dysphagia for 2 years. She complains of symptoms with both solids and liquids. Occasionally, she develops regurgitation of undigested foods 10-15 minutes after meals. Figure 12A shows the endoscopic view of the distal esophagus. Figure 12B shows the finding of barium esophagogram. Which of the following is the most likely diagnosis?

A. Schatzki ring  
B. Adenocarcinoma of the esophagogastric junction  
C. Achalasia  
D. CREST syndrome  
E. Hiatal hernia with gastroesophageal reflux disease

The recommended response is C.

The endoscopic figure shows a “rosette” appearance of the lower esophageal sphincter that remains closed with air insufflation. However, the endoscope can easily traverse with gentle pressure allowing examination of the stomach. The barium esophagogram shows the dilated esophagus ends in a so-called pointed bird’s beak that represents the nonrelaxing lower esophageal sphincter. These features are consistent with achalasia. The disease affects both sexes equally and can occur at any age. Onset is usually in the third to fifth decades. The duration of symptoms at presentation averages 2 years. Dysphagia is almost uniformly the predominant symptom, with solids in nearly all patients and with liquids in at least two thirds. The combination of dysphagia for both liquids and solids
has some utility in suggesting achalasia over obstructive strictures or tumors. The severity of dysphagia fluctuates and often accompanies chest pain, regurgitation, weight loss, nocturnal coughing spells, and bronchopulmonary complications. The diagnosis is suspected from a compatible clinical history and confirmed by typical findings in barium esophagogram, EGD, and manometry.


26. A 65-year-old woman presents with long standing history of diarrhea and urgency. She reluctantly admits to being incontinent for semi-formed stool on several occasions in the past 6 months. She has 3 vaginal deliveries with episiotomies but no muscular tear. Anal endosonography is performed and shows in Figure 13. Which of the following is the finding from anorectal function test of this patient?

A. Decreased resting pressure
B. Decreased squeezing pressure
C. Decreased rectal compliance
D. Failed expulsion of balloon
E. Absence of rectoanal inhibitory reflex

The recommended response is B.

An endosonographic figure shows a large, wedge-shaped anterior defect of external anal sphincter, characteristic for childbirth injury from episiotomies. Fecal incontinence is defined as either the involuntary passage or the inability to control the discharge of fecal matter through the anus. Three clinical subtypes have been described, including passive incontinence, urge incontinence, and fecal seepage. Detailed history and physical examination play an important role in evaluation of patients with fecal incontinence. Several modalities have been developed in order to identify the mechanism and etiology of fecal incontinence. The American Gastroenterological Association (AGA) has published the technical review on anorectal testing techniques providing the detailed
descriptions of the process and clinical significance of these tests, including anorectal manometry, anal endosonography, MRI, and pudendal nerve terminal motor latency.

Anal endosonography is a very useful technique for demonstrating anal sphincter anatomic features, both the thickness and structural integrity. Normal findings have been described, and sphincter defects due to scarring, loss of muscle tissue, and other local pathology have been demonstrated to correlate with surgical findings. This test is usually performed with a 7.5-MHz radial endosonographic probe, providing 360-degree view. Higher-frequency probes (10-15 MHz) are now being used for better delineation of the sphincter complex. A high concordance rate was established for identifying sphincter defects in the studies comparing anal endosonography with the other modalities, including EMG mapping, MRI, and anorectal function test. The advantage is that the test is simple, inexpensive, widely available, and less painful than needle insertion for EMG. However, the identification of abnormalities is dependent on the training and experience of the operator, and the test is subject to interobserver variability. In addition, anatomic variations with aging and gender differences may influence the interpretations.

In patients with external anal sphincter defect, the squeezing pressure during voluntary contraction is often reduced, whereas decreased resting pressure can be detected in patients with internal anal sphincter defect. Decrease rectal compliance is often seen in conditions associated with fibrosis (postradiation) or inflammatory (proctitis). Failure to expel the balloon may indicate underlying pelvic floor dysfunction or dyssynergic defecation, while the absence of rectoanal inhibitory reflex is pathognomonic for
anorectal aganglionosis (Hirschsprung’s disease). Both conditions usually result in constipation rather than fecal incontinence.


Figures

Figure 12 A
Figure 12 B
Figure 13