

## Questions 1 through 6

1. Which one of the following is the *MOST* likely diagnosis?
  - (A) Granulomatous colitis
  - (B) Acute vascular occlusion
  - (C) Ulcerative colitis
  - (D) Amebic colitis
  - (E) Cathartic colon
2. The *MOST* common complication of granulomatous colitis is
  - (A) hemorrhage
  - (B) fistula
  - (C) obstruction
  - (D) carcinoma
  - (E) perforation
3. Which one of the following roentgenographic signs is *MOST* characteristic of acute vascular occlusion of the colon?
  - (A) "Collar button" ulcers
  - (B) "Thumbprinting"
  - (C) "String" sign
  - (D) "Stack of coins"
  - (E) "Coil spring"
4. Which one of the following findings is *LEAST* characteristic of ulcerative colitis?
  - (A) Involvement of the rectum
  - (B) Circumferential involvement
  - (C) "Skip" areas
  - (D) Diffuse dilatation
  - (E) Perforation

5. The *LEAST* frequent single site of extracolonic involvement in amebiasis is the
- (A) lung
  - (B) brain
  - (C) liver
  - (D) peritoneum
  - (E) small bowel
6. Which one of the following roentgenographic findings is *LEAST* characteristic of a cathartic colon?
- (A) Smooth contours
  - (B) Effaced mucosa
  - (C) Inconstant areas of narrowing
  - (D) Poor evacuation of barium
  - (E) Ulceration

## Discussion

### QUESTION 1

These illustrations show evidence of ulcers distributed throughout almost the entire colon. The ulcers are largest on the left side where several are undermined (*arrows* in Figure 2B), whereas on the right side the ulcers are smaller and somewhat spiculated in appearance (*arrows* in Figure 2A). The undermining of the ulcers often produces the so-called "collar button" appearance (*white arrows* in Figure 2B, and in Figure 2C which is an enlargement of one of the undermined ulcers). Note that the disease involves the *entire circumference* of the colon as manifested by the fact that multiple *marginal* ulcers are seen in *all* projections. The circumferential distribution of the disease and the continuous involvement of one segment of the colon (in this case from the cecum to the sigmoid) are characteristic of acute ulcerative colitis, which is the diagnosis in this case. Therefore, **the correct answer to question 1 is (C)**. It is also typical for this disease to be associated with a rather patulous ileocecal valve and a somewhat dilated terminal ileum (the so-called "backwash ileitis") which is well shown in Figure 2B ("*T.I.*").

## Questions 7 through 10

7. Which one of the following is the *MOST* likely diagnosis?
- (A) Monilial esophagitis
  - (B) Esophageal varices
  - (C) Carcinoma
  - (D) Scleroderma
  - (E) Reflux esophagitis
8. Which one of the following is *LEAST* characteristic of monilial esophagitis?
- (A) Pain
  - (B) Associated debilitating systemic diseases
  - (C) Oral involvement
  - (D) Esophageal spasm
  - (E) Hemorrhage
9. "Down-hill" varices occur in which one of the following conditions?
- (A) Obstruction of the superior vena cava
  - (B) Obstruction of the portal vein
  - (C) Obstruction of the inferior vena cava
  - (D) Obstruction of the hepatic vein
  - (E) None of the above
10. Which one of the following statements concerning esophageal carcinoma is *MOST* likely?
- (A) It most commonly occurs in the proximal one third
  - (B) It is most often polypoid
  - (C) Adenocarcinoma is the most common cell type
  - (D) There is a higher incidence in achalasia
  - (E) Lesions in the distal one third have the best prognosis

## Questions 11 through 14

11. Which one of the following is the *MOST* likely diagnosis?
- (A) Benign gastric ulcer
  - (B) Ulcerated carcinoma
  - (C) Ulcerated leiomyoma
  - (D) Diverticulum
  - (E) Ulcerated lymphoma
12. Which one of the following roentgenographic signs is *MOST* suggestive of a benign ulcer?
- (A) Penetration beyond the gastric wall
  - (B) Crater less than 3 cm. in diameter
  - (C) Meniscus sign
  - (D) Lesser curvature location
  - (E) Abrupt transition between normal gastric mucosa and mound of tissue which surrounds the crater
13. Which one of the following roentgenographic signs is *MOST* suggestive of a malignant ulcer?
- (A) Greater curvature location
  - (B) Antral location
  - (C) Carman's sign
  - (D) Hampton's line
  - (E) Smooth mound of tissue around the ulcer
14. Which one of the following statements concerning gastric diverticula is *INCORRECT*?
- (A) Congenital (true) gastric diverticula are considered to be incomplete duplications
  - (B) Most gastric diverticula are located on the posterior wall of the cardia near the lesser curvature
  - (C) The most common complication is hemorrhage
  - (D) Acquired (false) diverticula are usually located near the pylorus
  - (E) Gastric diverticula have a tendency to empty rapidly

## Questions 15 through 19

15. Which one of the following is the *MOST* likely diagnosis?
- (A) Multiple adenomatous polyps
  - (B) Colitis cystica profunda
  - (C) Pseudopolyps of granulomatous colitis
  - (D) Pneumatosis cystoides intestinalis
  - (E) Acute vascular occlusion
16. Which one of the following statements concerning adenomatous polyps of the colon is *MOST* likely?
- (A) They are usually benign if pedunculated
  - (B) They are more common in the proximal than in the distal colon
  - (C) Pedunculated and sessile polyps have the same incidence of malignancy
  - (D) An increase in size indicates malignancy
  - (E) Lesions 2 cm. or larger are usually malignant
17. Which one of the following statements is *LEAST* characteristic of colitis cystica profunda?
- (A) It occurs primarily in the lower part of the colon
  - (B) The cysts commonly contain mucus
  - (C) The cysts are numerous
  - (D) It is primarily a disease of adults
  - (E) It is a precancerous condition
18. Which one of the following disorders is *MOST* commonly associated with pneumatosis cystoides intestinalis?
- (A) Constipation
  - (B) Infection of the wall of the colon
  - (C) Obstructive bronchopulmonary disease
  - (D) Vascular insufficiency
  - (E) Volvulus

19. Which one of the following statements concerning acute vascular occlusion of the colon is *LEAST* likely?
- (A) The sigmoid colon is the most common site
  - (B) It may be reversible with complete return to normal
  - (C) It may result in mucosal ulceration with subsequent stricture formation
  - (D) It may result in necrosis and perforation
  - (E) An arteriogram is helpful in confirming the diagnosis

## Discussion

### QUESTION 15

**The correct answer to question 15 is (D).** This case of pneumatosis cystoides intestinalis (pneumatosis coli) is shown to emphasize the importance of careful observation as well as differential diagnostic acumen. If you have not seen such a case before, it is understandable how you may have missed the diagnosis. After having seen this example you will be aware of the condition and remember the importance of carefully looking for the intramural "gas cysts" when you see multiple "polypoid" lesions in the sigmoid colon. Note that the "polypoid" lesions which indent the barium column in the sigmoid (Figure 7) have an appearance which, at first glance, might raise several diagnostic possibilities including multiple adenomatous polyps, the pseudopolyps associated with ulcerative and granulomatous types of colitis, and the "thumbprinting" seen in acute vascular occlusion of the sigmoid colon. However, in the case shown here the radiolucencies which indent the barium have *gas* density as proven by the fact that their *outer* margins (*arrows* in Figure 7A) are clearly demarcated from the adjacent water-density tissues. Such an appearance is diagnostic of the interesting condition termed pneumatosis coli or "pneumatosis cystoides intestinalis" of the colon. In this disease there are multiple gas-containing cysts of various sizes located most commonly in the subserosa, but sometimes in the submucosa. The overlying mucosa is entirely normal, as is the muscularis. Water-density lesions such as polyps, intramural hemorrhage ("thumbprinting"), and "pseudopolyps" can all be excluded once the gaseous density of the "polyps" has been noted. However, if you did *not* notice that these polypoid indentations of the intraluminal barium were due to gas cysts, it might be well to briefly consider the other roentgenological and clinical features which might help to exclude most of the other water-density

## Questions 20 through 24

20. Which one of the following is the *MOST* likely diagnosis?
- (A) Crohn's disease
  - (B) Sprue
  - (C) Hodgkin's disease
  - (D) Zollinger-Ellison syndrome
  - (E) Whipple's disease
21. Which one of the following statements concerning the roentgenographic findings in Crohn's disease is *LEAST* likely?
- (A) It may involve the stomach
  - (B) "Skip" areas are common
  - (C) There are often excessive secretions in the stomach and small intestine
  - (D) It may first present as an intestinal obstruction
  - (E) The most common site of involvement is the small bowel
22. Which one of the following combinations of small bowel roentgenographic signs is *MOST* characteristic of sprue?
- (A) Dilatation, abnormal amount of fluid, and segmentation
  - (B) "Thumbprinting", abnormal amount of fluid, and "skip" areas
  - (C) "Thumbprinting", abnormal amount of fluid, and segmentation
  - (D) Dilatation, "string" sign, and segmentation
  - (E) Dilatation, "cobblestoning", and segmentation
23. In the Zollinger-Ellison syndrome, which one of the following is produced by non-beta islet cell tumors of the pancreas?
- (A) Pancreatin
  - (B) Trypsin
  - (C) Secretin
  - (D) Gastrin
  - (E) Histamine

24. Which one of the following is *MOST* typical of Whipple's disease?

- (A) Granulomatous changes in the small bowel
- (B) Periodic acid-Schiff (PAS)-positive material in the macrophages
- (C) Stenotic "skip" areas
- (D) Polypoid hyperplasia of the mucosa
- (E) Predominant ileal involvement

## Discussion

### QUESTION 20

**The correct answer to question 20 is (D).** These illustrations show several characteristic signs of the Zollinger-Ellison syndrome. Note the enlargement of the gastric mucosal folds (Figure 8), the large amount of gastric fluid (Figure 9-1), and the considerable enlargement of the mucosal folds in the jejunum (*arrows*, Figure 10C). In addition there is an abnormal narrowed area in part 3 of the duodenum (Figure 10B, *lower white arrows*) in the center of which a small barium collection indicates a shallow ulcer (Figure 10B, *upper white arrow*). Although this region is narrowed due to the edema and spasm associated with the ulcer, the mucosal folds around the ulcer are still largely intact and do not exhibit the type of destruction usually associated with carcinoma. Distal to the ulcer the jejunum is somewhat dilated and the enlarged sharply defined jejunal mucosal folds (*arrows* in Figure 10C) are highly suggestive of edema. Note also that the barium in the lumen of the somewhat dilated jejunum is diluted due to fluid (Figure 10B). When one tries to explain all of these findings on the basis of *one* etiologic mechanism, the most likely diagnosis is the Zollinger-Ellison syndrome. It is significant that there is no obstruction at the gastric outlet in this case, the pylorus (*vertical arrows* in Figures 10A and B) being normally patent, thus indicating that the large amount of gastric fluid (Figure 9-1) is probably on the basis of gastric hypersecretions rather than pyloric obstruction. Although gastric and/or duodenal ulcers are often seen in patients with the Zollinger-Ellison syndrome, none is demonstrated on these illustrations. Although the ulcers in the stomach and duodenal bulb in patients with this disease are no different in appearance from those seen in patients with ordinary peptic ulcer disease, the demonstration of a

## Questions 25 through 29

25. Which one of the following is the *MOST* likely diagnosis?
- (A) Pancreatitis
  - (B) Emphysematous cholecystitis
  - (C) Duodenal obstruction
  - (D) Appendicitis
  - (E) Obstruction of the transverse colon
26. Which one of the following conditions is *LEAST* likely to produce pancreatitis?
- (A) Diabetes
  - (B) Alcoholism
  - (C) Gallstones
  - (D) Abdominal surgery
  - (E) Trauma
27. Emphysematous cholecystitis is associated *MOST* frequently with which one of the following?
- (A) Common duct stricture
  - (B) Gallstones
  - (C) Diabetes
  - (D) Adenomyomatosis
  - (E) Ascending cholangitis
28. In a patient with right lower quadrant pain, the single roentgenographic finding which is *MOST* suggestive of appendicitis is
- (A) failure to fill the appendix on a barium enema
  - (B) air-fluid levels in the right lower quadrant
  - (C) an oval calcification in the right lower quadrant
  - (D) loss of the right psoas shadow
  - (E) loss of the peritoneal fat line

29. Dilatation of the transverse colon is *LEAST* commonly produced by which one of the following?
- (A) Carcinoma of the colon
  - (B) Pancreatitis
  - (C) Acute cholecystitis
  - (D) Amebiasis
  - (E) Ileocolic intussusception

## Discussion

### QUESTION 25

Figures 11, 12, and 13 demonstrate an air-filled structure within the right upper quadrant which shows an air-fluid level on the upright projection. In the recumbent view (Figure 11), gas can be seen within the wall of this structure. Several small bowel loops in the same area are dilated.

**The correct answer, therefore, to question 25 is “emphysematous cholecystitis” (B),** as these are the roentgen manifestations of this condition. The dilated small bowel loops represent localized ileus in response to the adjacent inflammatory reaction of the gallbladder.

Your first impression might be a dilated duodenum because of the location of the gas-filled gallbladder. However, the lack of evidence of gastric obstruction or a dilated duodenal bulb is against this diagnosis.

Although pancreatitis and appendicitis may be associated with localized dilatation of small bowel loops (“sentinel loops”), the identification of the gas-filled gallbladder excludes these diagnoses.

### QUESTION 26

In question 26, alcoholism, gallstones, abdominal surgery, and trauma are all frequently associated with or causes of pancreatitis. Although severe pancreatitis may result in the development of diabetes, diabetes itself is not a cause of pancreatitis. Therefore, **your answer to question 26 should be (A).**

## Questions 30 through 35

30. Which one of the following is the *MOST* likely diagnosis?

- (A) Carcinoma
- (B) Villous adenoma
- (C) Lymphosarcoma
- (D) Hemangioma
- (E) Metastasis

For each of the numbered clinical disorders listed below (Questions 31–34), select the *one* lettered characteristic (A,B,C,D,E) that is *MOST* closely associated with it. Each lettered characteristic may be selected once, more than once, or not at all.

- (A) Frequent calcification
- (B) Angulation of loops
- (C) Softness and pliability
- (D) Marked mesenteric involvement
- (E) Often circumferential

31. Carcinoma

32. Villous adenoma

33. Lymphosarcoma

34. Metastasis

35. Which one of the following statements concerning villous adenomas is *MOST* likely?

- (A) They are firm in consistency
- (B) They are most common in the cecum
- (C) They are often pedunculated
- (D) They may be associated with serum electrolyte imbalance
- (E) They have a low potential for malignancy

## Questions 36 through 40

36. Which one of the following is the *MOST* likely diagnosis on the basis of the roentgenographic findings?
- (A) Annular pancreas
  - (B) Duodenal atresia
  - (C) Midgut volvulus
  - (D) Duodenal band
  - (E) Communicating duplication
37. Duodenal atresia is *MOST* commonly associated with which one of the following conditions?
- (A) Mongolism
  - (B) Prematurity
  - (C) Maternal diabetes
  - (D) Meconium ileus
  - (E) None of the above
38. Which one of the following statements concerning congenital duodenal bands is *MOST* likely?
- (A) They usually obstruct the first portion of the duodenum
  - (B) They usually produce complete obstructions
  - (C) They are not usually associated with malrotation
  - (D) They are often seen in patients with midgut volvulus
  - (E) They are a common cause of meconium ileus
39. Which one of the following statements concerning midgut volvulus is *INCORRECT*?
- (A) It is characterized by obstruction of the third part of the duodenum
  - (B) It characteristically persists until corrected surgically
  - (C) It occurs in both infants and adults
  - (D) The cecum usually is high in the left upper abdomen
  - (E) It is often associated with obstructing peritoneal bands

40. Which one of the following statements concerning annular pancreas is *INCORRECT*?
- (A) It is discovered more frequently in infants than in adults
  - (B) It usually affects the second (descending) portion of the duodenum
  - (C) It most commonly causes a partial obstruction
  - (D) The usual roentgenographic manifestation is an indentation of the outer (convex) portion of the duodenum
  - (E) Peptic ulcer is often an associated complication

## Discussion

### QUESTION 36

**The correct answer to question 36 is (B).** In this condition there is atresia of the duodenum distal to the duodenal bulb, and in about 80 per cent of the cases the atretic segment is located distal to the ampulla of Vater. Duodenal atresia is the most common cause of congenital obstruction of the duodenum, and since the obstruction is always *complete* in duodenal atresia, there is no evidence of gas distal to the proximal part of the duodenum (the smallest "bubble" in Figures 16 and 17). Thus, the presence of the characteristic "double bubble" during the first few days of the infant's life, particularly when there is no roentgenographic evidence of gas distal to the distended duodenum, makes the diagnosis of duodenal atresia by far the most likely possibility.

The vast majority of patients with duodenal atresia have the onset of their symptoms within 24 hours following birth. It is also important to remember that in duodenal atresia the obstruction is so *high* in the gastrointestinal tract that the associated frequent vomiting and inability to retain fluids and electrolytes can cause the infant's condition to deteriorate rapidly unless a duodenoduodenostomy or a duodenojejunostomy is performed promptly. Therefore, an early diagnosis is not only important, but also possible in the vast majority of cases because of the presence of the so-called "double bubble" sign in an infant with symptoms of high obstruction. The largest "bubble" on the left side of the abdomen is the gas in the distended stomach, whereas the gas in the considerably distended first portion of the duo-

## Questions 41 through 46

41. Which one of the following is the *MOST* likely diagnosis?

- (A) Twisted ovarian cyst
- (B) Pseudocyst of the pancreas
- (C) Small bowel obstruction
- (D) Tubo-ovarian abscess
- (E) Massive ascites

For each of the numbered clinical disorders listed below (Questions 42–46), select the *one* lettered roentgenographic sign (A,B,C,D,E) that is *MOST* closely associated with it. Each lettered roentgenographic sign may be selected once, more than once, or not at all.

- (A) "Pseudotumor"
- (B) "Football"
- (C) "Ground glass"
- (D) "Coffee bean"
- (E) "Dog ear"

42. Sigmoid volvulus

43. Strangulating small bowel obstruction

44. Pneumoperitoneum

45. Ascites

46. Pelvic fluid

## Questions 47 through 54

47. Which one of the following is the *MOST* likely diagnosis?

- (A) Sprue
- (B) Regional enteritis
- (C) Scleroderma
- (D) Whipple's disease
- (E) Zollinger-Ellison syndrome

For each of the numbered disease entities listed below (Questions 48–52), select the *one* lettered feature (A,B,C,D,E) that is *MOST* closely associated with it. Each lettered feature may be selected once, more than once, or not at all.

- (A) "Creeping fat"
- (B) "Pseudo-obstruction"
- (C) Arthralgia
- (D) Peptic ulceration of the jejunum
- (E) "Moulage"

48. Sprue

49. Regional enteritis

50. Scleroderma

51. Whipple's disease

52. Zollinger-Ellison syndrome

53. Which one of the following is *LEAST* likely to occur in sprue?

- (A) Intussusception
- (B) Mucosal atrophy
- (C) Segmentation
- (D) Ulceration
- (E) Widening of mucosal folds

## Questions 55 through 58

55. Which one of the following is the *MOST* likely diagnosis?
- (A) Giant hypertrophic gastritis
  - (B) Zollinger-Ellison syndrome
  - (C) Superficial spreading carcinoma
  - (D) Lymphosarcoma
  - (E) Eosinophilic gastroenteritis
56. Which one of the following is *MOST* commonly associated with giant hypertrophic gastritis?
- (A) Multiple ulcers
  - (B) Islet cell tumor of the pancreas
  - (C) Excessive gastric secretion
  - (D) Gastric bleeding
  - (E) Involvement mainly of the lesser curvature
57. In the differential diagnosis between the Zollinger-Ellison syndrome and gastrointestinal lymphoma, which one of the following roentgenographic findings is *MOST* suggestive of the Zollinger-Ellison syndrome?
- (A) Multiple ulcerations
  - (B) Gastric hypersecretion
  - (C) Retrogastric mass
  - (D) Enlargement of the gastric mucosal folds
  - (E) Abnormal small bowel mucosal pattern
58. Which one of the following statements about eosinophilic gastroenteritis is *LEAST* likely?
- (A) Usually the entire stomach is involved
  - (B) It is not premalignant
  - (C) It is not related to granuloma with eosinophils
  - (D) A history of allergy is usually present
  - (E) A peripheral eosinophilia is frequently seen

## Questions 59 through 63

59. Which one of the following is the *MOST* likely diagnosis?
- (A) Lymphosarcoma
  - (B) Tuberculosis
  - (C) Carcinoma
  - (D) Intramural hemorrhage
  - (E) Granulomatous colitis
60. Which one of the following statements concerning primary lymphosarcoma of the colon is *LEAST* likely?
- (A) It occurs more commonly in the cecum than in other parts of the colon
  - (B) It generally involves a longer segment than does carcinoma
  - (C) It often produces widening of the lumen at the site of the lesion
  - (D) It is common in children
  - (E) It is less common than primary lymphosarcoma of the small intestine or stomach
61. Which one of the following is *MOST* likely to mimic ileocecal tuberculosis?
- (A) Granulomatous ileocolitis
  - (B) Amebiasis
  - (C) Ulcerative colitis
  - (D) Carcinoma of the cecum
  - (E) Lymphogranuloma venereum
62. The *MOST* suggestive roentgenographic manifestation of an intramural hemorrhage due to venous or arterial occlusion is
- (A) "thumbprinting"
  - (B) multiple ulcerations
  - (C) rigidity
  - (D) spasm
  - (E) fixation of the involved segment

## Questions 64 through 68

64. Which one of the following is the *MOST* likely diagnosis?
- (A) Meconium peritonitis
  - (B) Meconium ileus
  - (C) Necrotizing enterocolitis
  - (D) Aganglionosis
  - (E) "Meconium plug" syndrome
65. Meconium peritonitis is *MOST* frequently associated with which one of the following?
- (A) Pneumoperitoneum
  - (B) Malrotation
  - (C) Mucoviscidosis
  - (D) Small bowel atresia
  - (E) Prematurity
66. Meconium ileus is associated with which one of the following conditions?
- (A) Meconium peritonitis
  - (B) Small bowel atresia
  - (C) Fibrocystic disease
  - (D) Biliary atresia
  - (E) Gas in the wall of the gut
67. Which one of the following is *LEAST* characteristic of necrotizing enterocolitis?
- (A) Intramural gas
  - (B) Perforation
  - (C) Prematurity
  - (D) Severe diarrhea
  - (E) Respiratory distress

68. Which one of the following statements concerning congenital aganglionosis of the colon is *INCORRECT*?

- (A) The aganglionic segment is not dilated
- (B) It is limited to the rectum and a contiguous portion of the sigmoid in most patients
- (C) It is not related to congenital microcolon
- (D) Excessive retention of barium in the colon for more than 24–48 hours after barium enema is an early finding in young infants
- (E) It may involve the entire colon

## Discussion

### QUESTION 64

**The correct answer to question 64 is (C)**, this being a typical example of necrotizing enterocolitis of the newborn. The illustration of the film dated 4-11-71 (Figure 29) shows no abnormal findings in the chest or abdomen. However, on the photograph of the film dated 4-13-71 (Figure 30) there are several important radiological findings which indicate the presence of a significant and dangerous condition which threatens the infant's life. In the newborn it is normally difficult, if not impossible, to differentiate small bowel and colon gas, and this is true on the first illustration (Figure 29). However, 2 days later (Figure 30) the colon can be recognized because of its distention by what, at first glance, *appears* to be a mixture of solid fecal material and gas. It is unusual for the colon of a newborn infant to be so clearly depicted on plain roentgenograms. It is also abnormal for such an infant's colon to be filled with what appears to be the solid adult-type of fecal material mixed with gas, since infant stools are usually quite liquid in consistency.

How, then, does one explain these findings? First, the somewhat "bubbly" appearance of the colon is not due to the adult-type of formed stools but is due to a combination of findings which includes intraluminal blood, sloughed colonic mucosa, intraluminal gas, and some fecal material. One of the reasons the colon is so well outlined is that there is *gas* in the wall, which is particularly well seen on the lateral margin of the descending

## Questions 69 through 72

69. Which one of the following is the *MOST* likely diagnosis?
- (A) Familial polyposis
  - (B) Granulomatous colitis
  - (C) Ulcerative colitis
  - (D) Lymphosarcoma
  - (E) Colitis cystica profunda
70. Which one of the following is *LEAST* characteristic of familial polyposis?
- (A) Involvement of the small bowel
  - (B) Development of carcinoma before age 40
  - (C) Tiny sessile polypoid lesions
  - (D) Absence of rigidity
  - (E) Normal length and caliber of the colon
71. Which one of the following roentgenographic findings is *LEAST* common in granulomatous colitis?
- (A) Involvement of the rectum
  - (B) Associated involvement of the terminal ileum
  - (C) Large pseudopolyps
  - (D) Limitation to the right half of the colon
  - (E) "Skip" areas
72. Which one of the following is the *MOST* common manifestation of lymphoma of the colon?
- (A) Multiple small polypoid lesions
  - (B) Single large bulky mass
  - (C) Diffuse infiltration of the wall
  - (D) Multiple ulcerations
  - (E) Obstruction

## Questions 73 through 77

73. Which one of the following is the *MOST* likely diagnosis?
- (A) Ulcerative colitis
  - (B) Granulomatous colitis
  - (C) Polyposis
  - (D) Peutz-Jeghers syndrome
  - (E) Scleroderma
74. Which one of the following is *MOST* suggestive of ulcerative colitis?
- (A) Pseudodiverticula
  - (B) Eccentric involvement
  - (C) Undermining ulcers
  - (D) Stenotic disease of the terminal ileum
  - (E) Predominant involvement of the right side of the colon
75. In the differential diagnosis of ulcerative and granulomatous colitis, which one of the following statements is *LEAST* likely?
- (A) Toxic megacolon is diagnostic of ulcerative colitis
  - (B) Granulomatous colitis generally occurs in a younger age group than ulcerative colitis
  - (C) Carcinoma of the colon is a more common complication of ulcerative than of granulomatous colitis
  - (D) Distal colonic involvement is less characteristic of granulomatous than of ulcerative colitis
  - (E) Massive hemorrhage may occur in both ulcerative and granulomatous colitis
76. Which one of the following is *MOST* characteristic of familial polyposis?
- (A) It is first discovered in infancy
  - (B) The polyps are usually greater than 1 cm. in diameter
  - (C) Carcinoma frequently develops before middle age
  - (D) Hemorrhage occurs frequently
  - (E) There are associated small bowel polyps

## Questions 78 and 79

78. Which one of the following is the *MOST* likely diagnosis?

- (A) Pneumatosis coli
- (B) Small bowel obstruction
- (C) Retroperitoneal hematoma
- (D) Retroperitoneal perforation of the duodenum
- (E) Intramural hematoma of the colon

79. Which one of the following roentgenographic findings is *LEAST* significant in the diagnosis of retroperitoneal hematoma?

- (A) Obliteration of psoas muscle shadow
- (B) Presence of a soft tissue mass
- (C) Lateral displacement of the kidney
- (D) Displacement of the duodenum
- (E) Fractures of lumbar transverse processes

## Questions 80 through 85

80. Which one of the following is the *MOST* likely diagnosis?
- (A) Adenomyoma
  - (B) Gallstone
  - (C) Cholesterol polyp
  - (D) Adenomatous polyp
  - (E) Carcinoma
81. Which one of the following statements is *INCORRECT*?
- (A) Unconjugated Telepaque is fat soluble
  - (B) Orally-administered Telepaque is absorbed by the intestinal mucosa
  - (C) After absorption, Telepaque is bound to serum albumin
  - (D) The Telepaque excreted into the bile is water soluble
  - (E) Conjugated Telepaque is easily absorbed by the intestinal mucosa
82. Which one of the following procedures is the single *MOST* helpful part of intravenous cholangiography?
- (A) Roentgenography of the erect patient
  - (B) Right lateral decubitus roentgenography
  - (C) Tomography
  - (D) Compression roentgenography
  - (E) Roentgenography after a fatty meal
83. In a patient who has *not* had a cholecystectomy, which one of the following disorders is indicated by good visualization of the common bile duct without corresponding visualization of the gallbladder during cholangiography?
- (A) Carcinoma of the ampulla of Vater
  - (B) Stone impacted in the distal common bile duct
  - (C) Obstruction of the cystic duct
  - (D) Carcinoma of the pancreas
  - (E) None of the above

## Questions 86 and 87

86. Which one of the following is the *MOST* likely diagnosis?

- (A) Metastatic melanoma
- (B) Kaposi's sarcoma
- (C) Leiomyosarcoma
- (D) Lymphosarcoma
- (E) Ectopic pancreas

87. Which one of the following neoplasms has the highest incidence in the ileum?

- (A) Kaposi's sarcoma
- (B) Leiomyosarcoma
- (C) Fibrosarcoma
- (D) Lymphosarcoma
- (E) Adenocarcinoma

## Discussion

### QUESTION 86

Did you look carefully at Figure 41? If you did you saw several ulcerated lesions in the small bowel as well as one involving the stomach (indicated by arrows on Figure 41A). In addition, there are multiple nodules within the right lung base seen through the liver.

Because of their appearance these lesions have been called "bull's-eye lesions". Although not pathognomonic for metastatic melanoma, multiple nodules within the lungs and the intestinal tract, and their "bull's-eye" na-

## Questions 88 through 90

88. Which one of the following is the *MOST* likely diagnosis?
- (A) Intussusception
  - (B) Small bowel obstruction due to adhesion
  - (C) Mesenteric infarction
  - (D) Appendicitis with ileus
  - (E) None of the above
89. Which one of the following statements about intussusception of the small intestine in adults is *MOST* likely?
- (A) It is rarely associated with a lead mass
  - (B) It is most easily demonstrated with a retrograde barium study
  - (C) It is most often ileocolic
  - (D) It is most often acute in onset
  - (E) It is more often associated with a benign than with a malignant process
90. Which one of the following signs *MOST* strongly suggests mesenteric infarction in a patient with an acute abdomen?
- (A) Dilatation of the small bowel and ascending and transverse colon
  - (B) Marked vascular calcification
  - (C) Fluid-filled loops
  - (D) A "sentinel" loop
  - (E) Linear gas shadows in the periphery of the liver

## Questions 91 through 93

91. Which one of the following is the *MOST* likely diagnosis?
- (A) Paralytic ileus
  - (B) Gallstone ileus
  - (C) Obstruction of the small bowel
  - (D) Pseudo-obstruction of the small bowel
  - (E) Vascular occlusion
92. Which one of the following conditions is *LEAST* likely to be associated with ischemic necrosis of the bowel?
- (A) Intussusception
  - (B) Volvulus
  - (C) Gallstone ileus
  - (D) Obstruction due to adhesion
  - (E) Incarcerated hernia
93. Which one of the following is *LEAST* characteristic of mechanical obstruction of the small intestine?
- (A) Long air-fluid levels
  - (B) "Step-ladder" pattern of distended loops
  - (C) Separation of loops
  - (D) Absence of gas in the colon
  - (E) Dilated fluid-filled loops

## Questions 94 through 97

94. Which one of the following is the *MOST* likely diagnosis?
- (A) Carcinoma
  - (B) Intussusception
  - (C) Meckel's diverticulum
  - (D) Stricture
  - (E) Gallstone ileus
95. Intussusception in the adult is *MOST* commonly due to
- (A) Meckel's diverticulum
  - (B) benign small bowel tumor
  - (C) malignant small bowel tumor
  - (D) lymphoid hyperplasia
  - (E) adhesions
96. Which one of the following is the *DEFINITIVE* diagnostic sign of gallstone ileus?
- (A) Gas in the biliary ducts
  - (B) Small bowel obstruction
  - (C) Annular calcification within the abdomen
  - (D) Air-fluid levels in the gallbladder
  - (E) None of the above
97. Which one of the following complications of Meckel's diverticulum is *LEAST* common?
- (A) Intestinal obstruction
  - (B) Peptic ulcer
  - (C) Bleeding
  - (D) Perforation
  - (E) Calcified enteroliths

## Questions 98 through 101

98. Which one of the following is the *MOST* likely diagnosis?

- (A) Malignant ulcer
- (B) Benign ulcer
- (C) Retrogastric mass
- (D) Intramural mass
- (E) Ectopic pancreas

99. Which one of the following roentgenographic findings is *MOST* suggestive of a malignant gastric ulcer?

- (A) Penetration beyond the wall of the stomach
- (B) An ulcer greater than 3 cm. in diameter
- (C) A profiled ulcer which lies within the lumen
- (D) Abrupt transition between normal mucosa and the soft tissue mound surrounding the crater
- (E) Folds radiating into the crater

100. Which one of the following statements about gastric ulcers is *CORRECT*?

- (A) Ulcers which become larger during therapy are malignant
- (B) Ulcers which become smaller during therapy are benign
- (C) Ulcers on the greater curvature are usually malignant
- (D) Gastric ulcers should be considered malignant and treated surgically
- (E) None of the above

101. Which one of the following statements concerning leiomyomas is *INCORRECT*?

- (A) The roentgenographic differential diagnosis from leiomyosarcomas is usually impossible
- (B) Ulceration and mucosal bleeding are characteristic
- (C) They are less common in the stomach than in any other part of the gastrointestinal tract
- (D) They may contain calcification
- (E) They usually show the roentgenographic features of submucosal tumors

## Question 102

102. Which one of the following is the *MOST* likely diagnosis?

- (A) Carcinoma of the jejunum
- (B) Lymphoma of the jejunum
- (C) Intussusception
- (D) Regional enteritis
- (E) Gallstone ileus

## Discussion

The small bowel series films in Figures 49 and 50 demonstrate incomplete obstruction of the jejunum secondary to **intussusception (C)**. The roentgen manifestations of intussusception of the small bowel using contrast media from above are characteristic but differ somewhat from those demonstrated by barium enema.

Schatzki, in his classic description of the roentgen findings of intussusception shown by barium enema, defined three concentric cylinders at the intussusception site (Figure 50A): (1) a central canal, (2) a peripheral sheath separated by (3) a space which contains the intussuscepted mesentery lined by the serosa of the two telescoped intestinal segments. Barium enema reveals the distal end of the intussusceptum as a cup-shaped filling defect. Often a tumor mass is seen as an added filling defect. Barium in the peripheral sheath outlines the circular bands of crowded haustra in the intussuscipiens resulting in a spiral or coiled spring appearance. Occasionally the central canal of the intussusceptum is seen.

## Questions 103 through 106

103. Which one of the following is the *MOST* likely diagnosis?
- (A) Leiomyoma
  - (B) Villous adenoma
  - (C) Endometriosis
  - (D) Adenomatous polyp
  - (E) Lipoma
104. Which one of the following is *MOST* characteristic of villous adenoma?
- (A) Multiple separate lesions
  - (B) Marked radiolucency
  - (C) Copious mucous secretions
  - (D) A smooth surface
  - (E) Most commonly found in the small intestine
105. Which one of the following statements concerning endometriosis is *LEAST* likely?
- (A) It may cause obstruction
  - (B) Its most common intestinal location is the colon
  - (C) It appears as an intramural mass
  - (D) It is not usually associated with symptoms
  - (E) The lesions may be multiple
106. Which one of the following is the *MOST* common location of lipomas?
- (A) Esophagus
  - (B) Stomach
  - (C) Duodenum
  - (D) Jejunum and ileum
  - (E) Colon

## Questions 107 through 109

107. Which one of the following is the *MOST* likely diagnosis?
- (A) Renal abscess
  - (B) Ileocolic intussusception
  - (C) Gastric outlet obstruction
  - (D) "Closed loop" obstruction
  - (E) Suprarenal hematoma
108. Which one of the following is *LEAST* likely to be associated with a soft tissue mass seen on plain roentgenograms of the abdomen?
- (A) Hydronephrosis
  - (B) Intussusception
  - (C) Appendicitis
  - (D) Hypertrophic pyloric stenosis
  - (E) Choledochal cyst
109. Which one of the following statements concerning the use of enemas in ileocolic intussusception in young children is *CORRECT*?
- (A) A carefully performed barium enema is effective and accepted treatment in many cases
  - (B) It should not be used as treatment for intussusception
  - (C) A barium enema can be used to reduce the intussusception, but this should always be followed by surgical exploration
  - (D) If the intussusception cannot be reduced easily, the barium enema fluid pressure should be increased
  - (E) Postevacuation films are of little use

## Questions 110 and 111

110. Which one of the following is the *MOST* likely diagnosis?
- (A) Carcinoma of the pancreas
  - (B) Pseudocyst of the pancreas
  - (C) Emphysematous gastritis
  - (D) Abscess of the lesser sac
  - (E) Perforated duodenal ulcer
111. A decrease in serum calcium level in a patient with an "acute abdomen" should *MOST* likely suggest which one of the following diagnoses?
- (A) Small bowel obstruction
  - (B) Acute pancreatitis
  - (C) Pseudocyst of the pancreas
  - (D) Acute pyelonephritis
  - (E) Perforated hollow viscus

## Discussion

### QUESTION 110

Figures 54 and 55 show numerous gas bubbles behind the anteriorly displaced stomach extending both to the right and left of the spine. **The most likely diagnosis with this roentgen finding is an abscess of the lesser sac (D).**

Although carcinoma or pseudocyst of the pancreas could cause such displacement, the gas bubbles essentially exclude these diagnoses.

Emphysematous gastritis is an unusual variant of phlegmonous gastritis due to invasion of the gastric wall by gas-forming organisms. Onset of the disease is explosive and the course fulminating, with a high mortality rate. Generally the condition follows a pre-existing gastrointestinal illness, opera-

## Questions 112 through 117

112. Which one of the following is the *MOST* likely diagnosis?

- (A) Congenital antral diaphragm
- (B) Hypertrophic pyloric stenosis
- (C) Annular pancreas
- (D) Jejunal atresia
- (E) Ileal atresia

For each of the numbered clinical disorders listed below (Questions 113–117), select the *one* lettered clinical roentgenographic manifestation (A,B,C,D,E) that is *MOST* closely associated with it. Each lettered clinical roentgenographic manifestation may be selected once, more than once, or not at all.

- (A) Frequently diagnosed by clinical manifestations alone
- (B) Decreased iliac index
- (C) Obstructing peritoneal band
- (D) Severe microcolon
- (E) Obstruction relieved by Gastrografin or other enema

113. Duodenal atresia

114. Midgut malrotation

115. "Meconium plug" syndrome

116. Ileal atresia

117. Hypertrophic pyloric stenosis