ANSWERS: CHAPTER 7

MATCHING

1. d 5. m 9. n 13. j
2. f 6. l 10. i 14. g
3. h 7. a 11. c
4. b 8. k 12. e

IMAGE LABELING

1A. Common hepatic duct
1B. Common bile duct
1C. Main pancreatic duct
1D. Accessory duct
2A. GB
2B. Porta hepatis of the liver
2C. Spleen
2D. Left kidney
2E. Duodenum
3A. Pancreatic head
3B. Pancreatic neck
3C. Pancreatic body
3D. Pancreatic tail
3E. Uncinate process
4A. Portal confluence
4B. Splenic vein
4C. SMA
4D. Left renal vein
4E. Aorta
4F. IVC

MULTIPLE CHOICE

1. b 6. d 11. b 16. b
2. a 7. b 12. d 17. a
3. c 8. a 13. c 18. b
4. d 9. b 14. c 19. c
5. b 10. d 15. a 20. d

FILL-IN-THE-BLANK

1. Aorta; superior mesenteric; left renal
2. Splenic; stomach; kidney
3. Duct, Wirsung; common bile duct; duodenum
4. Langerhans; endocrine
5. Negative; rise; fall
6. Diabetes
7. Carbohydrates; lipase; proteins
8. Hypoechoic
9. Head; body; tail
10. Upright
11. Epigastric; back; sits up or bends at the waist
12. Amylase; lipase
13. Hypoechoic; irregular; pancreatic duct
14. Pseudocysts
15. Chronic pancreatitis
16. Fifth; uncommon
17. Exocrine, endocrine
18. Body; tail; small
19. Microcystic; malignant mucinous
20. Polycystic

SHORT ANSWER

1. A curved array transducer is typically used to evaluate the pancreas. A 2 to 5 MHz is typically used for the adult patient, whereas a higher frequency can be used in children. The patient should be NPO for 8 to 12 hours prior to the examination to minimize gas in the stomach and duodenum. When performing a complete abdominal examination, the pancreas should be evaluated first to limit the amount of air caused by the patient taking in multiple deep inspirations during the exam. The examination of the pancreas is normally begun with the probe in a transverse plane in the epigastric area just below the xiphoid process. The probe may be rotated counterclockwise slightly to image the entire gland. The left lobe of the liver can be used as a window in many patients and having the patient take in a deep breath can enhance its usefulness. The tail may be visualized by scanning through the patient’s left side. If the pancreas is difficult to visualize, having the patient drink water and then scanning the patient in the upright position may help.

2. The islets of Langerhans are part of the endocrine system, which produces hormones that help regulate the blood glucose level: insulin, glucagon, and somatostatin. The acini cells are part of the exocrine system, which secretes digestive enzymes into the pancreatic duct. The enzymes that the exocrine system produces include amylase, lipase, trypsinogen, and chemotrypsinogen, which are essential for the body’s digestion and absorption of essential nutrients.

3. Serum amylase and lipase are used to evaluate for pancreatic disease. Serum amylase usually rises within 3 to 6 hours of the first onset of clinical symptom, reaching a maximum level within 20 to 30 hours. Urine amylase is slower to rise and may remain elevated for longer than serum amylase. Lipase is slower to rise, typically within 24 to 48 hours after the onset of symptoms, and can remain elevated for longer than amylase.
4. Biliary tract disease and excessive alcohol intake are the most common causes of pancreatitis, but it can also be caused by abdominal trauma, drugs, and viral infections. Complications of acute pancreatitis can include pancreatic abscess, peri-pancreatic fluid collections, pancreatic pseudocyst formation, phlegmonous pancreatitis, dehydration, renal failure, pulmonary edema, and chronic pancreatitis.

5. A large mass located within the head of the pancreas may compress and obstruct the distal common bile duct as it enters into the duodenum. With distal common bile duct obstruction, the gallbladder is the first part of the biliary tree to dilate. A large, thin-walled gallbladder caused by a mass in the head of the pancreas is referred to as Courvoisier gallbladder.

**IMAGE EVALUATION/PATHOLOGY**

1. The calipers are measuring an echogenic stone, which likely entered the pancreatic duct through the biliary tree. The normal measurement of the main pancreatic duct is less than 2 mm. This duct is dilated.

2. A thick-walled complex mass is seen in the left upper quadrant. Multiple cystic areas are noted along with solid components. The mass is seen to compress the left kidney. With a history of severe pancreatitis and its location near the pancreatic tail, this mass most likely represents a pancreatic pseudocyst.

3. A well-circumscribed hypoechoic mass is seen in the region of the pancreatic head. Adenocarcinoma occurs most commonly in the pancreatic head.

4. Calcifications are seen throughout the neck, body, and tail of the pancreas. The pancreatic head appears normal. This is consistent with chronic pancreatitis, which can occur in patients with chronic cholecystitis or chronic alcohol abuse. It can also occur in patients with hypercalcemia or hyperlipidemia.

5. The mass is small, well-circumscribed, and hypoechoic. The mass is located in the neck of the pancreas. The solid mass is most likely an adenocarcinoma of the pancreas. On further examination, it was determined to be an islet cell tumor.

**CASE STUDY**

1. A complex mass with a large cystic component is seen. Complications of acute pancreatitis include: pancreatic abscess, left pleural effusion, splenic vein thrombosis and splenomegaly, phlegmonous pancreatitis, dehydration, and chronic pancreatitis.

2. A is the common bile duct, B is the GDA, and C is a dilated main pancreatic duct. A large, irregular, hypoechoic mass is seen in the region of the pancreatic head. The most likely diagnosis is an adenocarcinoma of the pancreas. The gallbladder must be evaluated, as it may be dilated in cases of a large pancreatic head mass. The liver should be evaluated for metastasis and the surrounding area for lymphadenopathy.