Volume two of Clinical Examination and Applied Medicine: Gastroenterology Series deals with radiology, endoscopy, and a picture quiz with multiple-choice questions related to gastroenterology. Numerous diagrams and figures have been included to stimulate understanding and learning.

The brief facts given with each image should help answer most bedside queries and problems. The text serves as an indispensable resource for preparation of undergraduate and postgraduate examinations. It includes a collection of facts and relevant details in the clinical assessment of patients with gastroenterological disorders. It should be complemented with volume one of Clinical Examination and Applied Medicine: Gastroenterology Series to learn the skills and foundations in gastroenterological examination and bedside assessment of the patients.

Dr Mushtaq Haroon, born in Pakistan, is an academician, educationist, and consultant in medicine for over 25 years with over 10 years experience as professor of medicine at various medical colleges in Pakistan. To his credit, he has 25 publications in peer-reviewed medical journals and published five medical books as first author. He completed his early training in medical unit 1 of Services Hospital attached to Allama Iqbal Medical College, Lahore and went to UK for higher training. He passed MRCP in 1988 and was awarded FRCP from London in 2000. Dr Haroon has been a pioneer in computer-based medical education, having developed a vast collection of software for teaching. He was awarded the Life Time Achievement Award for the most distinguished Iqbalian for professional excellence by the Chief Minister of Punjab in Dec 2008. He is presently consultant in Pakistan Kidney and Liver Institute and Research Centre, Lahore Pakistan.
Clinical Examination and Applied Medicine
Clinical Examination and Applied Medicine

Gastroenterology Series

Volume II

Mushtaq Haroon
This book is dedicated to my loving wife, Romana.

Abstract

This is the Volume II of Clinical Examination and Applied Medicine–
Gastroenterology Series, which deals with radiology, endoscopy, and a
picture quiz with multiple choice questions in gastroenterology. A wealth
of diagrams and figures have been included to stimulate understanding
and learning. As a stimulus for learning, picture test and MCQs have
been added.

A medical student or a postgraduate doctor studying for higher exam
is expected to broaden his or her knowledge about common and uncom-
mon gastrointestinal diseases, improve clinical skills, formulate a good
differential diagnosis, and finally, reach a conclusive diagnosis. The brief
facts given with each image should help answer most bedside queries and
problems. It will hopefully serve as an indispensable resource for prepara-
tion of undergraduate and postgraduate examinations.

The book is not a replacement for standard textbook on the subject,
but it is hoped that it would serve as a collection of facts and relevant
details in clinical assessment of the patient.

Keywords

Endoscopic images, esophageal diseases, gastroenterology images, GI CT
scan, GI diseases, GI endoscopy, GI images, GI photo quiz, GI radiology,
GI X-rays, intestinal diseases, liver diseases, liver diseases, pancreatic dis-
eases, stomach diseases
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PART I

Radiology Section
X-ray Int Interpretations

The standard plain x-ray of abdomen are supine AP and erect AP views. If the patient cannot stand, a lateral decubitus view may be taken. In the plain film of the abdomen, identify and look for the following:

Screening:

1. The lateral border of psoas muscle may be hazy in retroperitoneal abnormalities.
2. Sub-diaphragmatic areas may contain gas due to rupture of an abdominal viscous (Figure 58). An air–fluid level can be appreciated in case of an abscess.

Figure 58 There is air under the diaphragm (arrows), suggesting a leak from an abdominal viscus. The patient had obstipation, vomiting, fever, and abdominal tenderness with rigidity

3. The diaphragm may also be raised due to absorption collapse of the lung or from push from the abdomen as with enlarged liver (liver abscess), or gross splenomegaly. It may also be seen with weakness of the diaphragmatic muscle (eventration of the diaphragm).
4. Renal outline may be enlarged in hydronephrosis.
5. Ureteric and urinary bladder areas may demonstrate calcific areas due to stones. Calcification is seen with stones in the gallbladder and urinary tract. Phleboliths, fecoliths, mesenteric lymph nodes, blood vessels, adrenal glands (TB), uterus (fibroids), liver, spleen, and pancreas may also demonstrate calcific areas.

Figure 59 Eventration of the diaphragm on the left, with raised right hemidiaphragm in patient with gross hepatomegaly on the right top. On the bottom left to right, plain x-ray abdomen showing bilateral kidney stones with two kidney stones on CT in the middle and kidney and gall stones on the right.
6. Liver and splenic enlargement may be visible as a soft tissue mass in the respective hypochondrium.

7. Dilatation and fluid levels may be seen in obstruction of the large and small bowel (Figure 60). In toxic dilatation of the colon, as in ulcerative colitis, Crohn’s disease, or severe diarrhea, the transverse colonic diameter is more than 6 cm (Figure 68).

8. Spine and sacroiliac joints may also demonstrate abnormalities on a plain x-ray of the abdomen.
Barium swallow is done to detect esophageal pathologies like esophageal stricture (smooth outline), carcinoma (irregular margin with overhanging edges), and motility disorders (producing a corkscrew appearance). In achalasia, the proximal part is markedly dilated with distal tapering (Figure 52 in Volume I). At times, there may be indentation of the esophageal outline, for example, along the upper margin in aortic dilatation and along the middle in left atrial enlargement.

![Figure 61](image.png)

**Figure 61** On the left, a barium meal shows a typical peptic ulcer crater on lateral view. On the right, a barium meal shows a thinned stomach with reduced capacity. This is seen in infiltrating cancer called linitis plastica.

Malignancy in stomach is best diagnosed on endoscopy (see Figures 91, 103, and 107 in the endoscopy section. Also see page 97 in Volume I). Features suggesting on barium study are given as follows:

1. Irregular filling defect.
2. Irregular edges.
3. Location at the antrum or greater curvature is more commonly malignant.
4. The mucosal folds do not reach the edge of the ulcer in malignancy.
5. Linitis plastica (infiltrating adenocarcinoma in Figure 61).
Carcinoma of the colon may present with an obstructing mass with shouldering sign (overhanging edges) and irregular pattern (Figure 62 and page 121, Volume I). The diagnosis is established on colonoscopy and biopsy (Figure 101).

Figure 62 Barium enema showing classical mass and filling defect with shouldering (arrow) and over-hanging edges. An apple core appearance is also seen when there is annular constriction. This was carcinoma of the colon
Ulcerative colitis is characterized by uninterrupted inflammation and ulceration of the colon. These continuous lesions especially involve the rectum. The ulcers are usually shallow, with granularity of the wall, loss of haustrations, and hosepipe-like colon on barium study, in later stages (Figure 63). The colon may be narrowed and shortened. Pseudopolyps are swollen mucosa between areas of ulcerations that project into the lumen (Figure 63). Also see endoscopic features in Figure 99 in the endoscopy section and details on page 108, Volume I.

Figure 63 Barium enema in advanced ulcerative colitis with hosepipe-like large bowel and total loss of haustration in pancolitis on the left. In the middle, showing granularity (small black arrows), pseudopolyps (white arrows), and extensive ulceration (black large arrows). On the right, CT showing colon from the mid descending down to the rectum moderately thickened (inflamed) in a patient with chronic bloody diarrhea, characteristic of ulcerative colitis
Crohn’s disease is associated with transmural inflammation, fibrosis, narrowing, producing skip lesions (normal intervening bowel). Sinus tracts, micro-perforations, and fistula may be seen. It classically involves the terminal ileum, but may involve any part of the gut. About 20 percent have disease limited to the colon and one-third have perianal disease (skin tags, fissure, abscess, and fistula). Fatigue, chronic diarrhea, crampy abdominal pain, weight loss, and fever, with or without overt bleeding (uncommon), are the hallmarks of Crohn’s disease. The major signs are stricture and mucosal lesions. Strictures are of variable length and are responsible for the string sign (Figure 64). Fine ulcerations produce a cobblestone appearance. Rose thorn ulcers are characteristic. Thickening of the bowel wall and inflammation produce displacement of the bowel. Malabsorption may be present. Extraintestinal manifestations include eye, skin, joint involvement. Also see endoscopic features in Figure 88 in the endoscopy section and page 108, Volume I for details.

Lymph node biopsy and MBTB PCR may be necessary to make a definitive diagnosis.

Figure 64  CT abdomen with IV and oral contrast, showing terminal ileal concentric mural thickening and narrowing (arrows) and multiple small abdominal lymph nodes. Differential diagnosis could be Crohn’s disease, tuberculosis terminal ileitis, and lymphoma
Malabsorption is suggested by shortening of the transit time of the barium, dilatation, scattering, flocculation, and feathery pattern of the barium with thickening of the mucosal folds.

Esophageal varices are best seen on endoscopy (Figure 87) when they can be counted and graded according to the size in relation to the lumen of the esophagus. They are characteristically seen in chronic liver disease with portal hypertension. Any other cause is rare. A barium esophagogram with varices is shown in Figure 65 and page 66, Volume I for details.

Figure 65 Barium swallow showing variable worm-like filling defects classical for esophageal varices. Esophageal varices are best evaluated by endoscopy where they can be numbered and classified according to the size and position (see Figure 101). Signs of threatening bleeding can be identified and therapeutic intervention (band ligation or sclerotherapy) offered at the same time.
Intestinal tuberculosis (tuberculous enteritis) classically affects the terminal ileum and may be indistinguishable from Crohn's disease. The lesions can be ulcerative, hyperplastic, or a combination. The caecum exhibits irritability, causing the barium to rush off. Intestinal tuberculosis (TB) may also take the form of ascites, lymphadenopathy, or miliary dissemination. It is important to remember that the terminal ileum is involved classically in both TB and Crohn's disease, which even might look similar on endoscopy. Colonoscopy and biopsy of the area should, therefore, be done and stained for acid-fast bacteria, culture, and PCR for mycobacteria done. Lymphoma and malignancy need to be excluded. A missed diagnosis of Crohn's disease and use of steroids in TB may be disastrous. Also see page 134 in Volume I for workup of tuberculosis.

Short bowel syndrome usually occurs when less than 120 cm of small bowel remains functional. It may be associated with GI operations (cancer, mesenteric vascular disease, inflammatory bowel disease, bariatric surgery, strangulated hernia, bowel injury, volvulus, and radiation or may be congenital) (Figure 66).
Complications and problems associated with short bowel syndrome include:

- Watery diarrhea due to loss of small intestinal surface and bacterial overgrowth and electrolyte disturbance with metabolic acidosis.
- May require parenteral nutrition, which may be associated with sepsis, liver disease, gallbladder disease, and nephrolithiasis.
- Hepatic failure in severe cases.
- Vitamin and mineral deficiency and metabolic bone disease.
- Gastric hypersecretion (requires acid suppression).
- Anastomotic ulcers.
- Allergic, eosinophilic disorders, and dental disorders are more common.

Management includes proton pump inhibitors (to prevent hyperacidity), maintain fluid and electrolytes, and early enteral nutrition.
Feature of sigmoid and cecal volvulus.

- Sigmoid volvulus (Figure 67A) results from the colon twisting about its mesentery. Clinically, it presents with gradual progressive abdominal pain, nausea, abdominal distension, and constipation or sudden onset of acute severe pain, obstruction, and vomiting. A flexible sigmoidoscopic detorsion may be successful as a treatment.
- A cecal volvulus (Figure 67B) occurs due to twisting of the mobile cecum and ascending colon. The result may be bowel obstruction, bowel ischemia, and eventually, perforation. Clinical presentation ranges from insidious or intermittent episodes of abdominal pain to an acute abdominal crisis.
Toxic megacolon occurs as a complication of inflammatory bowel disease (IBD), infectious colitis (especially clostridium difficile), diverticulitis, obstructive colonic cancer, and volvulus.

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- Patients present with severe bloody diarrhea.
- In IBD, the complication develops early, that is, in one-third, within three months of diagnosis, and in about two-third, in the first three years.
- Management consists of fluid resuscitation and correction of electrolytes. Broad-spectrum antibiotics along with intravenous corticosteroids are started. The bowel is completely rested and decompressed with a nasogastric or long intestinal tube, and a surgical consultation is done.
Paralytic ileus (pseudo-obstruction) may be due to a medical or surgical cause. The commonest medical cause is severe hypokalemia. Other causes include drugs (opioids, calcium channel blockers, anticholinergics). However, one needs to rule out acute surgical abdomen, spinal injury, postoperative cases, retroperitoneal bleeding, acute pancreatitis, post-delivery and diabetic coma. Postoperative ileus is associated with obstipation and intolerance of oral intake after an abdominal or nonabdominal surgery (usually prolonged abdominal or pelvic surgery). Other causes need to be excluded by a thorough history and examination along with laboratory tests (CBC, electrolyte panel including magnesium, BUN, liver function tests, amylase, and lipase).
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HCC diagnosis is usually delayed by 6 to 20 months due to absence of specific symptoms. Its size > 2 cm, vascular invasion into hepatic or portal vein, metastasis, and poor functional state, all contribute to poor outcome. Any sign of worsening of the chronic liver disease should prompt the doctor to look for HCC. Also see pages 76 and 78 in Volume I for hepatic mass and details of HCC.
Any patient presenting with fever, pain in the right iliac fossa, vomiting with signs of inflammation (tenderness and guarding with rebound) should immediately be surgically evaluated and managed or CT abdomen done if in doubt. Patients are hydrated, electrolytes corrected, given IV antibiotics, kept nil orally, and prepared for laparoscopic or open appendectomy. Also see details on page 126 in Volume I of the book.
These patients present either asymptomatic, change in bowel habit, blood in stool, abdominal pain, anemia, tenesmus, or with complications like obstruction, peritonitis of frank hemorrhage. They should get a CT abdomen, pelvis, and chest with carcinoembryonic antigen (CEA). It is important to take a family history of cancer. Resection offers the best outcome if possible followed by postoperative chemotherapy. Also see details on page 121 in Volume I of the book.

**Applied Medicine**

There is a long segment of mucosal thickening involving sigmoid colon measuring at least 7 cm (arrows). There is associated pericolic fat stranding, and multiple mesenteric nodules associated with thickening of the mesenteric and omental fat. This is suggestive of neoplastic process with multiple mesenteric and omental nodules probably representing metastasis. Colonoscopy and biopsy confirmed adenocarcinoma of the sigmoid colon.
Possibility of invasive tumor is less likely, especially when the patient presented with pain in the right hypochondrium, vomiting, and fever of only five-day duration. The patient was managed surgically. Also see details on page 92 in Volume I of the book.
The patient had presented with severe pain in the abdomen with vomiting and constipation with history of hernia. A rapid diagnosis is necessary to reduce mortality. Also see details of intestinal obstruction on page 122 in Volume I of the book.

**Applied Medicine**

The patient had presented with severe pain in the abdomen with vomiting and constipation with history of hernia. A rapid diagnosis is necessary to reduce mortality. Also see details of intestinal obstruction on page 122 in Volume I of the book.
Morphological classification of cirrhosis into micronodular, macronodular, and mixed types has mostly been abandoned, as it is unreliable and inaccurate. Clinical features of cirrhosis may be divided into nonspecific, related to liver cell failure, related to portal hypertension, and related to the underlying cause, and lastly, those due to complications.

Common causes or features of decompensation of CLD include jaundice, ascites, hepatic encephalopathy, esophageal varices, pruritus, asterixis, fetor hepaticus, low albumin, thrombocytopenia, prolonged INR, small nodular liver, and HCC. Also see details of cirrhosis on page 61 to 70 in Volume I of the book.
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Although the most common causes of cirrhosis of the liver include chronic viral hepatitis (hepatitis B, C), alcoholic liver disease, nonalcoholic fatty liver disease, other causes are considered in selected cases depending on the history. These include hemochromatosis, autoimmune hepatitis, biliary cirrhosis, primary sclerosing cholangitis, Wilson disease, alpha-1 antitrypsin deficiency, celiac disease, drugs (like methotrexate and isoniazid), granulomatous liver disease, idiopathic portal fibrosis, polycystic liver disease, infection (like brucellosis, syphilis, echinococcosis), cardiac cirrhosis, hereditary hemorrhagic telangiectasia, and veno-occlusive disease. Also see details of cirrhosis on page 61 to 70 in Volume I of the book.
Metastasis at diagnosis is seen in about 5 to 15 percent of cases and is more common with tumors larger than 5 cm or vascular invasion. The most common sites of metastasis are to the lung, abdominal lymph nodes, bone, and adrenal gland. It should be noted that perihilar lymphadenopathy does not always represent extrahepatic spread, and in patients with cirrhosis, benign lymphadenopathy is not infrequent at the porta hepatis and portocaval sites.

Alpha-fetoprotein levels usually raised (more than 500mcg/L) in HCC, but do not correlate with size, stage, or prognosis. Levels may be normal in up to 40 percent of small HCC or fibrolamellar variety of HCC. Also see details of cirrhosis on page 76 and 78 in Volume I of the book.
Many patients have untreatable disease at diagnosis because most patients have the same symptoms as the underlying chronic liver disease. However, sudden worsening of symptoms, uncontrolled ascites, encephalopathy, and jaundice might suggest the diagnosis. Pain in the right hypochondrium, weight loss, fever, or a palpable swelling may be seen in occasional patients. Some patients manifest with a paraneoplastic syndrome, developing hypoglycemia, hypercalcemia, erythrocytosis, or watery diarrhea. Imaging of HCC usually should include an abdominal ultrasound, a triphasic CT scan, MRI, and angiography. A typical ultrasound appearance and significantly high alpha-fetoprotein in a predisposed patient is usually sufficient for diagnosis. Also see details of cirrhosis on page 76 and 78 in Volume I of the book.
Fatigue, weight loss, prolonged diarrhea with abdominal pain, and fever, with or without gross bleeding, are seen in Crohn’s disease. Transmural bowel inflammation is associated with the development of sinus tracts, abscess, and fistula. Malabsorption occurs when bile salt absorption is affected in terminal disease. Also see details of inflammatory bowel disease on page 108 to 110 in Volume I of the book.
Pancreatic adenocarcinoma is a highly malignant tumor carrying a poor prognosis. More than two-third of the patients have weakness, weight loss, and anorexia with abdominal pain. Jaundice, nausea, vomiting, and diarrhea are seen in more than 50 percent cases. A nontender but palpable distended gallbladder is called Courvoisier’s sign. Clinical features depend on the tumor location, compressive signs, and hormonal effects. A left supraclavicular lymphadenopathy (Virchow’s node) or a palpable periumbilical mass (Sister Mary Joseph node) may rarely be seen. Also see details of pancreatic cancer on page 106 in Volume I of the book.
Patient had mild abdominal pain and significant weight loss for two months with abdominal swelling and increasing jaundice.

A large complex well-defined lesion (188 × 116 × 134 mm), seen on ultrasound adjacent to the pancreatic region extending up to umbilicus showing no vascularity on color Doppler.

**Figure 80b** CT shows a large heterogeneous complex mass with cystic and solid component associated with mass effect (arrows) on the adjacent structures and surrounded by fat stranding or soft tissue omental nodularity. Probably, pancreatic neoplasm.

**Applied Medicine**

Endoscopic ultrasound-guided (EUS-guided) or percutaneous biopsy may be obtained in doubtful cases. Staging may be done via contrast triphasic helical CT scan. CA 19–9, as a tumor marker for pancreatic cancer has a sensitivity and specificity of about 70 to 90 percent. Levels are related to the size of the tumor and are not expressed in Lewis negative blood group population (5 to 10 percent). In malignant disease, the levels are usually > 37 units/ml (sensitivity about 80 percent). Also see details of pancreatic cancer on page 106 in Volume I of the book.
Cholangiocarcinomas are bile duct cancers that may be intra- or extra-hepatic or perihilar. They are best diagnosed by contrast MRI or MRCP or with multiphasic contrast-enhanced liver mass protocol. Tumor markers (CA 19–9) and CEA are raised. Also see details of gall bladder tumors on page 92 in Volume I of the book.
Figure 82  Triphasic CT abdomen showing hepatomegaly with partially defined hepatic lesion noted in liver segment 6, which appears hypodense in pre-contrast (top left) and peripheral enhancing with central hyper-attenuating regions in arterial and porto-venous phases (right). It was diagnosed as a hepatic abscess.

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Ultrasound image of the same patient showing hypoechoic focal lesion in the right lobe, with no increased vascularity. It was drained (bottom right arrow). Klebsiella pneumoniae was isolated with no association with underlying colorectal cancer, as may be seen in the Asian population. Also see details of liver abscess on page 75 in Volume I of the book.
Majority of patients are asymptomatic and a fifth will develop symptoms over 15 years. Once symptomatic, the chances of complications (acute cholecystitis, cholidocholithiasis, cholangitis, and gallstone pancreatitis) increase with time. Rarely, gallbladder cancer, gallstone ileus, or impaction of gallstone in cystic duct with compression of the biliary passage may occur. When abdominal ultrasound is negative (smaller than 3mm stones), an endoscopic ultrasound may be done (can detect up to 1mm stones). Bile microscopy for microcrystal analysis and oral cholecystrogram are rarely done nowadays. Also see details of gall bladder disease on page 92 in Volume I of the book.
Metastatic liver disease is the second commonest metastatic disease after lymph nodes. Most are multiple with only 10 percent being solitary. Metastasis only to the liver is typically seen with colon cancer, HCC, and carcinoids. Clinical features depend on the primary, but in general are hepatomegaly, abnormal LFT, and features of obstruction and ascites. Also see details of metastatic disease on page 80 in Volume I of the book.

Figure 84 Triphasic CT abdomen showing enlarged inhomogeneous liver with multiple variable sized heterogeneous enhancing ill-defined focal lesions (black arrows). There is intrahepatic biliary radical dilatation with dilated portal vein (white arrow) and mild to moderate ascites. The lesions were secondary from a colon cancer. (Other common primary sites for metastasis to the liver are the eye, stomach, pancreas, breasts, and lungs.)
The risk of colorectal cancer includes a positive family history, age, male sex, black race, inflammatory bowel disease, and a history of abdominal irradiation. Other factors that may contribute include diabetes, obesity, smoking, excessive alcohol consumption, eating processed meat, and lack of exercise. On the other hand, aspirin and NSAIDs are considered to be protective. Also see details of colon cancer on page 121 in Volume I of the book.

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Figure 85 A contrast MRI of the abdomen showing a large exophytic sigmoid colon mass (arrows) with heterogeneous signal intensity. Abnormal mucosal thickening is noted at the sigmoid colon adjacent to the mass (lower right). This was a large exophytic sigmoid neoplasm.
PART II

Endoscopy Section
Esophageal candidiasis is seen most common in patients with hematologic malignancies and human immunodeficiency virus-infected patients.

- Most patients also have oral thrush.
- Esophageal candidiasis may also be seen with steroid use, even inhaled corticosteroids.
- The most common symptom is localized retrosternal odynophagia.
- Differential diagnosis if from other infections like cytomegalovirus, herpes simplex virus, medication-induced esophagitis, and eosinophilic esophagitis.
- Diagnosis is made during upper endoscopy, showing white or yellowish plaque-like lesions on the mucosal surface. Microscopy and cultures can confirm the diagnosis, if in doubt.
Treatment of acute variceal hemorrhage.

- Hemodynamic stabilization and correction of coagulopathy and transfusion (avoid over transfusion) to target hematocrit of about 40.
- Offer terlipressin, somatostatin, or octreotide at admission, even before confirmation by endoscopy, and continue for three to five days in addition to endoscopic band ligation or sclerotherapy, depending on the expertise within 12 h of presentation. A second session may be performed, if needed.
- Balloon tamponade is reserved for unresponsive cases waiting for TIPS (transjugular intrahepatic portosystemic shunt) or surgical interventions.
Esophagitis is most commonly seen with gastroesophageal reflux disease. It may also be associated with the following conditions:

- Candidiasis.
- Medications, radiation, caustic and nasogastric tube associated.
- Infection with herpes, cytomegalovirus, and HIV infection.
- Crohn’s disease.
- Eosinophilic esophagitis.
- Tuberculosis and actinomycosis.
- Behcet’s disease, pemphigoid, and epidermolysis bullosa.
Plummer–Vinson syndrome presents as a classical triad of dysphagia, iron-deficiency anemia, and esophageal webs. Also see details of Plummer–Vinson syndrome on page 102 in Volume I.

- The syndrome is extremely rare.
- Most of the patients are white middle-aged women, in the fourth to seventh decade of life.
- The importance of Plummer–Vinson syndrome is due to the association with upper alimentary tract cancers, especially squamous cell carcinoma of the pharynx and the esophagus.
- Plummer–Vinson syndrome can be treated effectively with iron supplementation and mechanical dilation (before the development of carcinoma).

Figure 89 Endoscopy showing proximal esophageal web (narrowing), which was associated with Plummer–Vinson syndrome
Peptic ulcer disease may be asymptomatic in two-third of the patients and only present when there is a complication. Dyspepsia with upper abdominal pain and discomfort is present in 80 percent. Also see details of peptic ulcer disease on page 94 in Volume I.

- Upper GI endoscopy is best for diagnosis (Figures 93 and 94), but asymptomatic cases may be picked up on a barium study (Figure 57).
- Bleeding is manifested by hematemesis or coffee ground vomiting, and melena. Massive bleeding may lead to hematoochezia and volume loss causing postural hypotension and tachycardia.
- Gastric outlet obstruction is a feature of pyloric channel or duodenal ulcers.
- Penetration is associated with change in pattern and radiation of the pain that is not relieved. Posterior penetration may be associated with rise in serum amylase.
- Perforation most commonly is seen with duodenal ulcers accounting up to 60 percent of the cases.
- Any patient having peptic ulcer disease should be tested for *H. pylori* infection.
Peptic ulcer disease represents about 40 percent of all cases of upper GI bleeding. Also see details of peptic ulcer disease on page 94 in Volume I.

- Risk of developing bleeding peptic ulcer with steroids use is debated, but when combined with nonsteroidal anti-inflammatory drugs (NSAIDs), incidence of hemorrhage increases by tenfold.
- Peptic ulcers are very often associated with \textit{H. pylori} or NSAID uses (approximately 96 percent).
- A rapid urease test (RUT) on biopsy is done in PUD (patient should not be bleeding or taking PPI). Histology can be followed. Other option is a delayed 13C-urea breath test (UBT) and stool antigen testing or serology for \textit{H. pylori}.
- Once an infection is diagnosed, antibiotic treatment is advocated.
- Outcome of endoscopic management: Hemostasis achieved in more than 95 percent, recurrent bleeding in less than 15 percent and mortality occurs in 6 to 8 percent.
Carcinoids are neuroendocrine tumors with more than half arising from the GI tract. Gastric carcinoids (Figure 92) are of three types. Type 1 being common in women are associated with atrophic gastritis and pernicious anemia. Type 2 occurs with Zollinger–Ellison syndrome (MEN-1). Type 3 is sporadic and more malignant. Also see details of carcinoid on page 121 in Volume I.

- Gastric carcinoids represent 2 to 3 percent of all GI carcinoids, but only 0.3 percent of all gastric tumors.
- The commonest site of the tumor is the terminal ileum.
- They are usually located in the body or fundus of the stomach, and may appear polypoid.
- They arise from GI neuroendocrine cells, and some are thought to develop as a result of high circulating gastrin.
- Endoscopy often demonstrates a submucosal mass with a central umbilication.
- Biochemical diagnosis requires measurement of serum 5 hydroxyindoleacetic acid (5OH-IAA).
- Clinical triad of diarrhea, flushing, and wheezing occurs when there is hepatic metastasis.
Dieulafoy lesions are produced by large (1–3mm) aberrant submucosal blood vessel that protrude through the mucosa (Figure 93) and can erode it to cause bleeding.

- It is not associated with a peptic ulcer, but can cause massive bleeding.
- It is usually located in the gastric fundus on the lesser curve, within 6 cm of the gastroesophageal junction, but can be present anywhere in the GI tract (GIT).
- Dieulafoy lesion may bleed intermittently and can be difficult to identify at endoscopy because the overlying mucosa may appear normal if the lesion is not bleeding.
- Treatment is usually via endoclip (hemoclips) deployed via endoscopy. Other modalities of treatment can be with a heater probe, laser therapy, or banding.
- Endoscopic Doppler ultrasound can also be used to identify difficult lesions.
Gastric lymphomas are the commonest forms of extra-nodal lymphomas and account for about 10 percent of all lymphomas. Also see details of GI lymphomas on page 124 in Volume I.

- Gastric lymphomas account for about 3 to 5 percent of the gastric malignancies.
- More than 95 percent of the gastric lymphomas are of the non-Hodgkin’s type.
- They present with epigastric pain or discomfort, anorexia, weight loss with sometimes occult blood loss. There may be early satiety.
- On endoscopic ultrasound, one can determine the extent of invasion and involvement of local lymph nodes. Biopsy specimen should be large (not pinch biopsy) so that the diagnosis is not missed.
- Treatment options include *H. pylori* eradication, radiation, and chemotherapy. For low-grade disease limited to the submucosa, eradication of *H. pylori* may regress the tumor in 60 to 75 percent of the patients. Endoscopic ultrasound is helpful in objective assessment of response to therapy post treatment.

Figure 94  Endoscopy showing fungating irregular ulcerated mass on the greater curvature of the stomach. Biopsy showed gastric lymphoma. It may also present with erythema, nodularity, and thickened folds

*Gastric lymphomas* are the commonest forms of extra-nodal lymphomas and account for about 10 percent of all lymphomas. Also see details of GI lymphomas on page 124 in Volume I.
Gastrointestinal stromal tumors (GIST) are uncommon tumors of the GIT.

- More than half of the GISTs start in the stomach. Most of the others start in the small intestine, but GISTs can start anywhere along the GIT.
- GISTs occur predominantly in middle-aged and older individuals.
- Some GISTs are asymptomatic and discovered incidentally.
- More often, they are associated with nonspecific symptoms (i.e., early satiety, bloating) unless they ulcerate, bleed, or grow large enough to cause pain or obstruction.
- Resection for all localized GISTs ≥2cm in size is recommended. There is no consensus on the management of incidentally encountered smaller GISTs, and their management must be individualized.
Choledocholithiasis may be diagnosed by endoscopic retrograde cholangiopancreatography (ERCP), magnetic resonance cholangiopancreatography, and endoscopic ultrasonography with comparable sensitivity and specificity.

- Therapeutic ERCP with sphincterotomy and stone removal is the treatment of choice for choledocholithiasis with jaundice, dilated common bile duct, acute pancreatitis, or cholangitis.
- Diagnostically ERCP is performed for cancers and obtaining tissue sample from distal hepatobiliary tract. Therapeutically, sphincter of Oddi dysfunction can be treated and palliation of biliary obstruction performed.
ERCP is used for indications like pancreatic cancer, chronic pancreatitis, cholangiocarcinoma, primary sclerosing cholangitis, common bile duct stone, and sphincterotomy.

- Common complications of ERCP include pancreatitis, bleeding, infection, and perforation.
- Mirizzi syndrome is said to be present when common hepatic duct obstruction is caused by an extrinsic compression from an impacted stone in the cystic duct or gallbladder neck or infundibulum.
Crohn’s disease is associated with transmural inflammation of any part of the GIT, with 80 percent of the patients having small bowel involvement, especially terminal ileum (Figure 98). About 20 percent have only colon involved, while 50 percent have ileocolitis. Also see details of inflammatory bowel disease on page 108 to 110 in Volume I. It may lead to one or more of the following complications:

- Inflammation that can lead to ulcers and scarring with narrowing (stenosis), or ulcers may spread through the bowel wall producing fistulas (perianal fistulas being the most common).
- Bowel obstruction.
- Anal fissure.
- Malnutrition.
- Colon cancer.
- Other health problems. Anemia, osteoporosis, and gallbladder or liver disease.

**Medication risks.** Azathioprine and anti-tumor necrosis factor (anti-TNF) treatment are associated with small risk of developing lymphoma and skin cancers. They also increase risk of infection.

- Corticosteroids can be associated with a risk of osteoporosis, bone fractures, cataracts, glaucoma, diabetes, and high blood pressure.

Figure 98 Colonoscopy showing Crohn’s disease with granular or nodular appearance (cobblestone) and narrowing of the terminal ileum shown in the four bottom slides. The top two slides show normal cecum and colonic mucosal pattern.
Ulcerative colitis is characterized by recurring episodes of inflammation involving colonic mucosa continuously without skip lesions (invariably involves the rectum). Also see details of inflammatory bowel disease on page 108 to 110 in Volume I. The indications for surgery include:

- Medically refractory disease.
- Severe uncontrolled hemorrhage.
- Perforation of the gut and development of severe or toxic megacolon.
- Colonic dysplasia or cancer.
- Patient preferences to repeated flares, high cancer risk, or medication issues.
Colonic polyps (Figure 100) are commonly asymptomatic, but can ulcerate, bleed, or cause tenesmus when present in the rectum. Rarely, when very large, they can produce intestinal obstruction. Also see details of familial polyposis on page 121 in Volume I.

- Colonic polyps may be hyperplastic or non-neoplastic, which are hamartomatous like in Peutz–Jeghers syndrome, juvenile polyps, and Cronkhite–Canada syndrome. Among these, Peutz–Jeghers polyps and juvenile polyps have malignant potential.
- Neoplastic polyps may be adenomas or carcinomas and are seen as sessile, pedunculated, flat, or depressed on endoscopy.
- The chances of developing cancer in a polyp increase if there is a villous structure on histology, with increasing polyp size, or when high-grade dysplasia is present in an adenoma.
- Serrated polyps can be neoplastic or non-neoplastic.
- Submucosal polyps can also be neoplastic or non-neoplastic.
- Pathologically, they maybe tubular (most common), villous, and tubulovillous. They may have high- or low-grade dysplasia.

Figure 100 Colonic polyps from top left to right are small sessile polyp, large pedunculated inflammatory polyp, and pedunculated tubulovillous polyps
Colonic cancer is the second most common cause of death related to cancer in men in the United States, and third in women. Left-sided cancer (Figure 101), and especially rectal are increasing. Screening is recommended in less than 50 years if there is family history or a predisposing condition. Also see details of colorectal cancer on page 121 in Volume I. It is associated with the following risk factors:

- Age over 50 years: About 90 percent of the patients are over 50 years of age (average being 72 years).
- Family history of polyps.
- Family history of colon cancer, especially if diagnosed at a young age.
- Genetic alterations:
  - Hereditary nonpolyposis colon cancer (HNPCC).
  - Familial adenomatous polyposis (FAP).
- Ulcerative colitis or Crohn’s disease.
- Risk is higher if already having colon cancer.
- Diet with increased red meat and fat (especially, animal fat) and low in calcium, folate, and fiber may increase risk of colon cancer.
- Inactivity and obesity have also been linked to higher risk of colon cancer.
- Cigarette smoking.
Diverticular disease (DD) develops when small (usually 5–10mm in diameter) protuberances develop from the wall of the colon (Figure 102). The condition is called diverticulosis, but when acute inflammation sets in, it is called acute diverticulitis. Also see details of diverticular disease on page 127 in Volume I.

- Diverticulosis is mostly asymptomatic and may not be discovered unless it gets inflamed (diverticulitis) in about 15 percent of cases, or bleeds.
- It is predominately right-sided, especially affecting the sigmoid colon.
- Symptoms are nonspecific and include abdominal pain (especially, left lower quadrant) with change in bowel habit. Features of bacterial overgrowth may be present. Fever with chills and bleeding may occur when complicated by infection. Bleeding occurs in 5 to 15 percent and may be life-threatening.
- Diet rich in fiber and vegetables may help prevent symptomatic disease. Some studies suggest that probiotics may help with diverticulosis symptoms and may help in preventing diverticulosis. Smoking seems to increase the risk of complications associated with DD.
- Obesity is associated with increased risk of diverticulitis.
- Diverticulitis develops due to a small tear in the diverticulum, while bleeding is due to weakness and rupture of the artery of the diverticular wall.

Figure 102 Colonoscopy showing diverticular disease (DD)
Ischemic bowel should be considered in the diagnosis of any elderly patient with abdominal pain where the diagnosis is uncertain after basic investigations. Also see details of ischemic colitis on page 120 in Volume I.

- Risk factors include old age, atherosclerosis, atrial fibrillation, heart failure, hypotension and shock, coagulopathies, and endocarditis. Patients with ischemic heart disease, stroke, those taking oral contraceptives, with underlying cancer and inflammatory bowel disease.
- Clinical features can range from a mild bout of short-lived abdominal pain or diarrhea to bloody diarrhea or a more serious situation, such as gangrene that may require surgery and even end in death.
- An ischemic problem may be caused by an interruption in blood passage through an artery.
- Venous obstruction (thrombus) also may result in intestinal ischemia, although less commonly than arterial causes.

*Figure 103 Colonoscopy showing areas friable and necrotic areas of the colon highly suspicious of ischemic bowel*
Pseudomembranous colitis (PMC) is an acute, exudative colitis usually caused by *Clostridium difficile*, but rarely also by *Staphylococcus*, *Enterotoxigenic Clostridium perfringens*, *Salmonella*, *Campylobacter*, or *Listeria*. Also see details of acute and chronic diarrheal disease on page 110 to 118 in Volume I.

- *Clostridium difficile infection (CDI)* is associated with antibiotic-associated colitis and accounts for about 25 percent of the hospital-acquired antibiotic-associated diarrhea.
- Any antibiotic can increase the risk of CDI, including metronidazole and vancomycin, which are used in the treatment of CDI.
- PMC can occur with even a single use of an antibiotic. Anticancer drugs and proton pump inhibitors have also been associated with CDI.
- Metronidazole and vancomycin have been the mainstays of therapy.
Gastrointestinal angiodysplasia (GIAD) are aberrant blood vessels or vascular malformations that are benign and present since birth or acquired later in life (Figure 86) due to unknown cause. They account for 20 to 30 percent cases of GI bleeding.

- GIAD is present in the large intestine (75 percent), and sometimes in the small intestine (17 percent), but can be anywhere.
- It causes GI bleeding, from mild to perfuse or periodic, resulting in anemia. About half of the patients may have more than one angiodysplasia. In individuals over 60 years of age, GIAD is the second most common cause of bleeding after diverticulosis. The prevalence of GIAD is higher in end-stage kidney disease, aortic stenosis, and Von Willebrand disease.
- Symptomatic conditions may be treated via following interventions:
  - Endoscopic cautery using techniques such as argon plasma coagulation (APC).
  - Selective arterial embolization in severe cases that could not be reached by endoscopy. Angiogenesis inhibitors or octreotide have been tried.
PART III

Picture Quiz, MCQs, and Brief Information
Medical Quiz and MCQs

Q-1. This patient presented upper abdominal pain radiating to the back with abdominal distension. On examination, hepato-splenomegaly, ascites, and a palpable gallbladder were found. The patient also had peripheral edema. He recently developed jaundice. What is the likely diagnosis?

Figure 106

MCQ-1. The following are true or false for carcinoma pancreas?

1. Cigarette smoking increases the risk 1.5 times?
2. The classical triad of symptoms is pain, abdominal mass, and diarrhea?
3. Painless jaundice as a presentation for pancreatic head tumors has a poor prognosis?
4. Tumor-related antigens offer little help in diagnosis even in late disease?
 Ans-1. This patient probably has carcinoma of the pancreas (Courvoisier’s sign, that is, palpable gallbladder with jaundice is positive) and has developed inferior vena caval obstruction as evident by long dilated veins on the abdomen (it demonstrated flow downward) with ascites and edema.

Ans. to MCQ.

1. True (risk is proportional to number of cigarettes smoked).
2. False (the classical triad is pain, jaundice, and weight loss with anorexia).
3. False (it has a good prognosis, as there is early obstruction and early detection).
4. False (carcinoembryonic antigen, pancreatic oncofetal antigen, CA 19-9, DuPan-2, pancreatic cancer-associated antigen, and CA 50 offer a good chance of diagnosis, but are present late in disease).

Applied medicine. Pancreatic cancer.

• About 90 percent of the pancreatic cancers are ductal adenocarcinomas of exocrine pancreas.
• Pancreatic head tumors are twice as common.
• The five-year survival is about 5 percent.
• Risk factors include cigarette smoking, obesity, and nonhereditary chronic pancreatitis.
• Glucose intolerance can occur.
• In CT, look for pancreatic mass, dilated bile, or pancreatic ducts or evidence of metastasis.
• ERCP is also widely used for diagnosis of pancreatic cancer, especially when CT and ultrasound are negative. It can also provide brushing samples for cytology or for stenting a stricture.
• MRI does not offer any advantages over CT, but MRCP may be better than CT for defining the anatomy of the pancreatic duct and biliary tree.
• CA 19-9 has a sensitivity and specificity of about 80 to 90 percent. It is more of a prognostic indicator.

Ref: Harrison’s Principles of Internal Medicine.
Q-2. This patient had a one-week history of fever with chills, but without rigors. There were no localizing symptoms of infection. The WBC was 3800/cm with a normal differential count. What sign is shown on the abdomen that suggests the diagnosis? What further examination will help in the diagnosis and how will you confirm it?

Figure 107

MCQ-2. The following are true or false for typhoid fever?

1. Relapses usually occur at the peak of antibody titer?
2. Intestinal bleeding occurs in the first week after fever?
3. Perforation is usually sterile?
4. When Vi antigen is positive, the O and H may be negative?
Ans-2. Rose spots in typhoid fever are shown. Relative bradycardia may be observed and splenomegaly appears by the end of the first week of fever. Blood culture will confirm the diagnosis, but Typhidot or Widal will strongly suggest the diagnosis.

Ans-MCQ.

1. True.
2. False (usually in the second or third week of fever).
3. True (frank signs of peritonitis are usually lacking).
4. True (Vi antigen inhibits O and H agglutination).

Applied medicine. Typhoid fever.

- Typhoid is acquired through contaminated food or water.
- Decreasing the stomach acidity increases the susceptibility.
- Fever at presentation is present in around 75 percent of the cases. It can continue for four weeks in untreated cases.
- Abdominal pain is reported in only 30 to 40 percent.
- The incubation period is 10 to 14 days (range 3 to 21 days).
- GI symptoms included anorexia (55 percent), abdominal pain (30 to 40 percent), nausea (18 to 24 percent), vomiting (18 percent), diarrhea (22 to 28 percent), or constipation (13 to 16 percent).
- On examination, one may find a coated tongue (51 to 56 percent), splenomegaly (5 to 6 percent), and abdominal tenderness (4 to 5 percent). Rash (rose spots seen in 30 percent by the seventh day), hepatosplenomegaly (3 to 6 percent), and epistaxis. A relative bradycardia at the peak of high fever is also indicative of typhoid (also seen in viral fevers).
- Common complications include gastrointestinal bleeding (10 to 20 percent) and intestinal perforation (1 to 3 percent) usually seen in the third and fourth weeks of illness from hyperplasia, ulceration, and necrosis of the ileocecal Peyer’s patches at the initial site of salmonella infiltration.
- Neurologic manifestations occur in 2 to 40 percent and include meningitis, Guillain–Barré syndrome, neuritis, and neuropsychiatric feature (muttering delirium or coma vigil), with picking at bedclothes or imaginary objects.

Ref: Harrison’s Principles of Internal Medicine.
Q-3. This patient complained of gradual abdominal distension of three-month duration. She presented with hematemesis and was admitted in shock. What diagnosis is suggested from the sign shown?

![Figure 108](image)

**Figure 108**

MCQ-3. Give true or false in relation to cirrhosis of the liver?

1. Rarely, spider angioma may be found on the lower limbs?
2. Asterixis is present in grade IV hepatic encephalopathy?
3. Dupuytren’s contracture and parotid enlargement are predominantly seen in alcoholic cirrhosis?
4. Cyanosis with clubbing may be seen in cirrhosis?
Ans-3. The patient has spider angioma on the face with mild jaundice. This along with history of abdominal distension and recent hematemesis suggests cirrhosis and variceal bleeding.

Ans-MCQ.

1. True (this was described by Gabuzda, therefore called Gabuzda spider).
2. False (asterixis is present in grade-I and II encephalopathy. In grade IV, patient is in deep coma).
3. True (Dupuytren’s contracture is related to alcoholism and not to cirrhosis).
4. True (cyanosis is a rare feature of cirrhosis due to marked intrapulmonary shunting. It is called hepato-pulmonary syndrome. Mild clubbing is more common in primary biliary cirrhosis).

Applied medicine. Alcoholic liver disease.

- The spectrum of alcoholic liver disease varies from asymptomatic patient, fatty liver, or steatosis, acute alcoholic hepatitis to cirrhosis of the liver.
- Lab features suggesting alcohol liver disease include high gamma-glutamyl transferase, peripheral blood macrocytosis, and AST is much greater than ALT, and the ratio is usually greater than 1.5.
- Stopping alcohol is the most important step in treatment. Fatty liver might disappear within three months of abstinence.
- With acute alcoholic hepatitis about 30 percent patients may die if the PT is significantly prolonged.
- In alcoholic cirrhosis, only 50 percent patients might survive for five years.
- In alcoholic hepatitis, there is a long history of heavy alcohol intake jaundice, anorexia, fever, and tender hepatomegaly. A bruit heard over the liver in half the cases.

*Ref: Davidson principle and practice of medicine.*
Q-4. This patient gave history of recurrent deep vein thrombosis (DVT) in the past. She presents with a two-week history of progressive abdominal distension. There is no past history of jaundice or liver disease. On examination, there are no signs of chronic liver disease. What is the most likely diagnosis?

Figure 109

MCQ-4. Give true or false for each of the following statements?

1. Values of antithrombin-III only slightly below normal increasing the risk of thrombosis?
2. Portal vein thrombosis (PVT) may occur in cirrhosis?
3. Patients with antithrombin deficiency with acute thrombosis or embolism can be treated with antiplatelets?
4. Deficiency of protein C (a vitamin K-dependent hepatic protein) is associated with bleeding tendency?
Ans-4. PVT may develop in a variety of hyper-coagulable states, including polycythemia vera, essential thrombocythemia, and deficiencies of protein C, protein S, or antithrombin-III. Homocystinuria and mutations in factor V gene has also been implicated.

Ans-MCQ.

1. True.
2. True.
3. False (heparin is given).
4. False (recurrent thrombosis).

Applied medicine. Portal vein thrombosis.

- There is portal hypertension and reduction in the blood supply of the liver.
- It may be complete or incomplete. It is also important to know how extensive it is, for example, whether involving the superior mesenteric vein.
- It may be a complication of cirrhosis of liver or hepatocellular carcinoma.
- Another important underlying cause is portal pyemia from abdominal sepsis, and occasionally associated with acute pancreatitis.
- It is a known complication of splenectomy.
- Do power Doppler, while CT angiography (venous phase) is not always required.
- Patient may be asymptomatic (especially in chronic PVT) and first diagnosed after hematemesis due to bleeding esophageal varices.
- Signs of chronic liver disease are present if underlying cirrhosis is present.
- Ascites and splenomegaly may be seen.
- Acute PVT causes intestinal congestion and ischemia, which is associated with abdominal pain, diarrhea, rectal bleeding, abdominal distention, nausea, vomiting, anorexia, fever. Lactic acidosis and sepsis may be found. Splenomegaly is due to portal hypertension.

Ref: Harrison's Principles of Internal Medicine.
Q-5. This is a barium swallow of a patient with hematemesis. What does it show?

Figure 110

MCQ-5. Give true or false for each of the following statements?

1. Wedged hepatic vein pressure is normal in sinusoidal and postsinusoidal portal hypertension and elevated in presinusoidal portal hypertension?
2. Portal-systemic shunt surgery improves survival rates in patients with cirrhosis?
3. Beta-blockers reduce the splanchnic arterial and portal venous pressure?
4. Dose of propranolol is titrated to reduce the blood pressure (BP) by 25 percent?
Ans-5. Large esophageal varices. They appear as large longitudinal filling defects as the barium trickles around them.

Ans-MCQ.

1. False (elevated in sinusoidal and postsinusoidal and normal in presinusoidal portal hypertension).
2. False (only incidence of variceal bleeding is reduced, but encephalopathic complication increases).
3. True.
4. False (dose is adjusted to reduce the resting pulse by 25 percent).

Applied medicine. Esophageal varices.

- Variceal hemorrhage has 20 to 30 percent mortality with each episode of bleeding.
- About one-third of the patients with cirrhosis have varices.
- About one-third of the patients with varices will develop bleeding.
- Predictors of variceal bleeding include severity of cirrhosis (Child’s class); higher wedged-hepatic vein pressure; larger the size of varices; the location of the varix; and endoscopic stigmata like red wale signs, hematocystic spots, diffuse erythema, bluish color, cherry-red spots, or white-nipple spots. Patients with tense ascites also have an increased risk.
- Treatment of esophageal varices includes prophylaxis with beta blockade or primary prophylaxis with EVL.
  - Endoscopic variceal ligation (EVL) or endoscopic sclerotherapy.
  - Octreotide or somatostatin as splanchnic vasoconstrictors.
  - Balloon tamponade (Sengstaken–Blakemore tube or Minnesota tube) if endoscopy is not available or awaiting surgery in rare cases.
  - Transjugular intrahepatic portosystemic shunt (TIPS) is considered for patients who fail to respond to the aforementioned measures.
- Surgical esophageal transection is rarely required.

Ref: Harrison’s Principles of Internal Medicine.
Q-6. Name the three anti-ulcer medications that may be responsible for this appearance in a male patient.

Figure 111

MCQ-6. In relation to gynecomastia, give true or false.

1. In Klinfelter’s syndrome, it is bilateral and painless?
2. True gynecomastia can be separated from lipomastia by mammography or ultrasonography?
3. Early gynecomastia is characterized by proliferation in the breast of the fibroblastic stroma?
4. The normal ratio of production of testosterone to estradiol in adult men is 50:1?
Ans-6. Cimetidine, ranitidine, mesoprostal, and omeprazole.

Ans-MCQ.

1. True
2. True.
3. False (there is proliferation of both fibroblastic stroma and the ductal system).
4. False (100:1).

Applied medicine. Peptic ulcer disease.

- Duodenal and gastric ulcers are most commonly found in association with NSAID or *H. pylori*.
- The most well-known complications include bleeding, perforation, and gastric outlet obstruction.
- Tests for *H. pylori* include rapid urease, histology, serology, urea breath test, and stool antigen (all being about 90 percent specific and sensitive). Culture can also be done and may suggest the sensitivity to drugs. Serology will remain positive after previous exposure and treatment.
- The classical and historical features of peptic ulcer disease (PUD) include chronicity, periodicity, pointing sign, and relation to meals.
- Zollinger–Ellison syndrome is suspected and a fasting gastrin level sent when there are multiple ulcers, at unusual sites, strong family history of ulcer disease, there are recurrences, there is basal hyperchlorhydria, unexplained diarrhea, hypercalcemia suspicion of multiple endocrine adenomatosis, or prominent gastric or duodenal folds.
- Type A chronic gastritis affects the fundus and body with antral sparing classically associated with pernicious anemia.
- Type B chronic gastritis is antral predominant and associated with *H. pylori*.

*Ref: Harrison’s Principles of Internal Medicine.*
Q-7. This patient developed yellowness of the sclera and skin while taking chlorpromazine since the last six weeks. What complication has developed?

Figure 112

MCQ-7. In relation to jaundice, give true or false for each of the following statements.

1. Obstructive jaundice has a greenish tinge?
2. Hemolytic jaundice has an orange tinge?
3. Dark coca cola urine suggests obstructive jaundice?
4. Bradycardia is feature of hemolytic jaundice?
Ans-7. A deep jaundice with a history of taking a drug like chlorpromazine suggests a cholestatic cause of jaundice.

Ans-MCQ.

1. False (hemolytic jaundice has a greenish tinge).
2. False (obstructive jaundice has an orange tinge).
3. False (it is a feature of hemolytic jaundice).
4. False (it is a feature of obstructive jaundice).

Applied medicine. Obstructive jaundice.

- Conjugated biliary obstruction, intrahepatic cholestasis, hepatocellular injury, or an inherited condition.
- With high probability of obstruction, do ultrasound, magnetic resonance cholangiopancreatography (MRCP), endoscopic retrograde cholangiopancreatography, to look for evidence of intra- or extra-hepatic bile duct dilation.
- Also, do antimitochondrial antibody for primary biliary cholangitis.
- If negative, look for hepatocellular disease.
- With high probability of extra-hepatic obstruction, endoscopic ultrasound may be useful.
- For suspected hepatic injury, do serologic tests for viral hepatitis, antimitochondrial antibodies, antinuclear anti-smooth muscle, liver-kidney microsomal antibodies for autoimmune hepatitis, serum iron, transferrin, and ferritin for hemochromatosis. Also, do ceruloplasmin for Wilson disease, alpha-1 antitrypsin activity for alpha-1 antitrypsin deficiency, thyroid function tests, antibody screening for celiac disease, and test for adrenal insufficiency where clinically indicated.
- Inherited conditions associated with conjugated hyperbilirubinemia include Dubin–Johnson syndrome and Rotor syndrome.

Ref: UpToDate medicine.
Q-8. This patient complained of nausea, vomiting, and diarrhea followed by dryness of the mouth. The next day, she developed dizziness, blurred vision, and difficulty in speech and swallowing. After 48 hours, she further developed weakness and difficulty in raising the limbs. What is the likely diagnosis?

Figure 113

MCQ-8. In relation to the diagnosis, give true or false for each of the following statements.

1. There is history of eating canned food?
2. There is an ascending paralysis?
3. Unilateral cranial palsies are common?
4. Patients may die of cardiac failure?
**Ans-8.** Botulism (the toxin blocks nerve impulse transmission via acetylcholine at myoneuronal junction, autonomic ganglia, and parasympathetic nerve terminals) presents like a descending paralysis. This patient had a typical GI upset, motor weakness, ptosis, blurring, and other cranial nerve involvement.

**Ans-MCQ.**

1. True.
2. False (descending).
3. False (bilateral).
4. False (respiratory).

**Applied medicine. Botulism.**

- It is caused by neurotoxin elaborated by the *clostridium botulinum*. A disease acquired via contaminated food with predominant neurological features.
- It can be food-borne (enteric infectious botulism), via inhalational and through wound and rarely iatrogenic botulism via receiving the toxin for cosmetic reasons.
- Classical features include acute onset of bilateral cranial neuropathies associated with symmetric descending weakness without sensory defects. There is no fever. There may be bradycardia.
- Myasthenia gravis, Eaton–Lambert syndrome, Guillain–Barré syndrome, tick paralysis, poliomyelitis, stroke, and heavy metal intoxication need to be excluded as differential diagnosis.
- Demonstration of toxin in the blood is diagnostic. Analysis of stool, vomitus, and suspected food items may also reveal the toxin. EMG studies may help in the diagnosis.
- Patients may die of respiratory failure.
- Antitoxin with penicillin G or metronidazole is used in most cases.

*Ref: Harrison’s Principles of Internal Medicine.*
Q-9. This patient with lymphoma presented with progressive and resistant abdominal distension with ascites and right hypochondrial pain. There was no jaundice and the liver function tests were normal. He was admitted with hematemesis. What is the likely diagnosis and what simple investigation may confirm this?

Figure 114

MCQ-9. In relation to the Budd–Chiari syndrome, give true or false for each of the following statements.

1. Paroxysmal nocturnal hemoglobinuria may be responsible?
2. It may be seen in essential thrombocythemia?
3. It may be associated with lupus anticoagulant?
4. It is associated with pregnancy?
**Ans-9.** Abdominal ultrasound with Doppler may confirm the Budd–Chiari syndrome. The ascites in this case is usually resistant to diuretics and salt restriction.

**Ans-MCQ.**

1. True.
2. True.
3. True (it is associated venous and arterial thrombosis and recurrent miscarriages).
4. False.

**Applied medicine. Budd–Chiari syndrome.**

In any suspected or confirmed case, look for an underlying cause, for example, hepatocellular carcinoma (most common), other malignancies, myeloproliferative disorders, JAK2 mutation. Predisposition increases with exposure to oral contraceptives, in pregnancy, and postpartum period.

- Look for hypercoaguable states, including Factor-V Leiden gene mutation, protein C deficiency, protein S deficiency, antithrombin III deficiency, antiphospholipid syndrome, and hyperhomocysteinemia. Rarely, it may be associated with paroxysmal nocturnal hemoglobinuria and Behcet's syndrome.
- Subacute or chronic Budd–Chiari syndrome usually presents with ascites hepatomegaly and varices (right upper quadrant pain seen more with acute presentation), and normal or mild to moderate elevations liver function tests without jaundice. Encephalopathy is infrequent.
- The serum-ascites albumin gradient or gap (SAAG) in ascites has a gradient greater than 1.1.
- There is hypertrophy of the caudate lobe of the liver (separate blood supply).
- For diagnosis, one or more of the following investigations may be done. Doppler ultrasound of liver, triphasic CT abdomen, MRI with contrast, venography, and arteriography.
- Consider Budd–Chiari in the differential diagnosis of acute liver failure, acute hepatitis, or chronic liver disease especially if patient has the risk factors aforementioned.

*Ref: Harrison's Principles of Internal Medicine.*
Q-10. These reddish painful lesions developed in a patient with chronic diarrhea for five years. They were associated with pain and swelling in the left knee. What are the lesions called and name four causes?

Figure 115

MCQ-10. In relation to the preceding diagnosis, give true or false for each of the following statements.

1. It may be seen in thyrotoxicosis?
2. It may be seen in hemochromatosis?
3. It may be seen in polycythemia rubra vera?
4. It may be seen in primary biliary cirrhosis?
Ans-10. Erythema nodosum may be seen in inflammatory bowel disease, tuberculosis (TB), sarcoidosis, streptococcal infections, fungal infections, and so on. Classically, the red tender nodules are seen on the shins.

Ans-MCQ.

1. True.
2. True.
3. False.
4. True.

Applied medicine. Erythema nodosum.

- The nodules are painful.
- They are usually symmetrical.
- They can be recurrent.
- Females are more commonly affected.
- They can be idiopathic in almost half the cases and then self-limiting in three to six weeks.
- It may be associated with drugs like sulfonamides, oral contraceptives, and iodides.
- They may be associated with pregnancy.
- Common diseases associations include streptococcal infections, TB, fungal infections, inflammatory bowel disease, and sarcoidosis.
- Rare associations include chlamydial infection, Yersinia, tularemia, cat scratch disease, psittacosis, leptospirosis, and infectious mononucleosis.
- Rest, leg elevation, NSAID, and rarely potassium iodide are used for persistent lesions.

Ref: Harrison's Principles of Internal Medicine.
Q-11. This appearance of the leg was unilateral and may be seen in the following conditions associated with abdominal diseases.

Figure 116

1. Cirrhosis of the liver.
2. Cervical carcinoma.
3. Inflammatory bowel disease.
4. Budd–Chiari syndrome.

MCQ-11. In edema of cirrhosis of the liver, give true or false for each of the following statements.

1. High sinusoidal pressure in liver directly stimulates sodium and water retention by the kidney?
2. Hypoalbuminemia is always associated?
3. Hyperaldosteronism is due to reduced renal blood flow?
4. Should be treated initially with furosemide (Lasix)?
Ans-11.

1. False (edema is always bilateral).
2. True (after infiltration, there may be local blockage of lymphatics or venous flow).
3. False bilateral edema may be present with hypoproteinemia (true only if associated with DVT).
4. False (there is portal hypertension and ascites).

Ans-MCQ.

1. True.
2. True.
3. False (decreased hepatic metabolism).
4. False (initially aldosterone antagonist should be used).


In DVT edema, Homan sign, dilated veins on the foot, tenderness in the calf and a cord felt along the venous channel are characteristic signs. The local temperature may also be raised.

In relation to GI disorders, DVT may be associated with mucin-producing adenocarcinomas, pancreas and gastrointestinal tract, lung cancer, and ovarian cancer. In unprovoked or recurrent DVT or venous thromboembolic disease, thrombophilia work-up may be required, which includes deficiency of factor V Leiden, protein S, protein C, anti-thrombin III, antiphospholipid antibodies, anti-cardiolipin, beta-2 glycoprotein antibodies, anti-nuclear antibodies, prothrombin gene, homocysteine level, nephrotic syndrome work-up, TTP, and PNH work-up, plasminogen level, fibrinogen function, and so on (done as Figure 117 clinically suspected).

Ref: Harrison’s Principles of Internal Medicine.
Q-12. In this 210kg patient, the risk of the following is increased?

1. Cirrhosis of the liver?
2. Congestive cardiac failure?
3. Nephrotic syndrome?
4. Chronic kidney disease?

![Figure 118](image)

**MCQ.** In relation to obesity, give true or false for each of the following statements.

1. The normal weight/height index is 32?
2. It is associated with higher incidence of breast cancer?
3. The risk of diabetes mellitus is increased two times?
4. Incidence of cancer of the cervix is increased?
Ans-12.

1. True from NASH (gallbladder disease is also increased).
2. True (risk of hypertension in increased three times and that of ischemic heart disease 1.5 times).
3. True (massive obesity may be associated with heavy proteinuria).
4. True (via diabetes, hypertension, and focal glomeurlosclerosis).

Ans-MCQ.

1. False (normal weight height index is 20 to 24.9)
2. True.
3. False (the risk of diabetes is increased four times and that of hypertension is three times).
4. False (endometrial cancer risk is increased).

Applied Medicine. NASH (nonalcoholic steatohepatitis).

- The most common underlying abnormalities are obesity, insulin resistance, and metabolic syndrome.
- It is suspected in asymptomatic, nonalcoholic obese patients with chronically elevated SGPT with SGPT/SGOT ratio greater than 1 in the absence of viral hepatitis and hepatotoxic drugs.
- Other risk factors include total parenteral nutrition and use of steroids.
- In total, 25 percent of the general population and 70 percent of diabetics and obese develop steatosis and fatty liver, which may eventually lead to NAFLD (affects 25 percent of western population) and NASH (affects 5 to 10 percent of western population), which are risk factors for the development of cirrhosis of the liver (cryptogenic), and eventually, even hepatocellular carcinoma.
- At the stage of NASH, it is important to reduce weight and treatment with metformin may be offered.

Ref: Harrison’s Principles of Internal Medicine.
Q-13. What are the possible causes of these lesions, which tended to diminish if the abdominal muscles were made to contract?

Figure 119

MCQ-13. In relation to hepatoma, give true or false for each of the following statements.

1. Hepatoma may be associated with hyperglycemia?
2. Hepatoma may be associated with secondary polycythemia?
3. Exposure to carbon tetrachloride is associated with development of hepatoma?
4. Hepatic bruit is common in hepatoma?
Ans-13. These swellings are in the right hypochondrium. The differential diagnosis includes tumor in the liver, pancreas, stomach, colon, bone, muscle, or skin.

Ans-MCQ.

1. False (hypoglycemia may be associated).
2. True.
3. True.
4. True.

Applied medicine. Hepatic adenoma.
- Predominantly seen in young women.
- Most are solitary and located in the right lobe.
- May be associated with oral contraceptives, androgens, and with glycogen storage disorders. They are associated with the dose and duration of the drug. Continuous use of oral contraceptives is associated with a poorer prognosis and more chances of complications. Therefore, with pregnancy, there is a higher chance of hemorrhage and rupture.
- Patients maybe asymptomatic or present with abdominal pain or mass.
- Complications include spontaneous hemorrhage, rupture, and malignant transformation.
- Adenomas have to be differentiated from focal nodular hyperplasia where Liver function tests (LFTs) are usually normal. Clinical features and radiological features of both may be the same. Therefore, history of predisposition is important. Surgical resection can establish the exact diagnosis. Biopsy may result in excessive bleeding.
- Alpha fetoprotein is normal unless there is malignant transformation.
- Adenomatosis is a distinct disease associated with more the 10 adenomas on imaging and lack of correlation with drugs.
- Removal of the offending may result in regression in small tumors.

Ref: Harrison’s Principles of Internal Medicine.
Q-14. Name the abnormal physical sign that is seen. Name three causes of this appearance.

Figure 120

MCQ-14. In relation to veno-occlusive disease of the liver, give true or false for each of the following statements.

1. It may be associated with hepatic irradiation?
2. It may be associated with bush tea disease?
3. It may be associated with anticancer drugs?
4. It may be associated with hepatoma?
**Ans-14.** Dilated veins on the abdomen. They are seen in cirrhosis, vena caval obstruction, and Budd–Chiari syndrome.

**Ans-MCQ.**

1. True.
2. True.
3. True.
4. False.

**Applied medicine. Acute liver failure** (common causes).

- Acute viral hepatitis (hepatitis A, hepatitis B, hepatitis C, hepatitis D, hepatitis E, herpes simplex virus, Epstein–Barr virus, cytomegalovirus)
- Drug-induced liver injury or idiosyncratic drug reactions (including herbal supplements and illicit drugs).
- NASH.
- Acetaminophen toxicity.
- Ischemic hepatitis.
- Budd–Chiari syndrome.
- HELLP (hemolysis, elevated liver enzymes, low platelets) syndrome.
- Acute fatty liver of pregnancy.
- Wilson disease.
- Autoimmune hepatitis.
- Alpha-1 antitrypsin deficiency.
- Toxin-induced hepatitis (e.g., mushroom poisoning, carbon tetrachloride).

*Ref: Harrison’s Principles of Internal Medicine.*
Q-15. This is a classical barium enema. Give true or false for each statement.

1. In this disease, inflammation is uniform and continuous with no intervening areas of normal mucosa.
2. Rectum is usually involved in 95 percent of cases.
3. In this disease, the inflammation extends through all the layers of the intestinal wall.
4. There is cobble stone appearance of the mucosa.

Figure 121

MCQ-15. Give true or false for each of the following statements.

1. Skip lesions are only seen in Crohn’s disease?
2. Serosal inflammation is a feature of Crohn’s disease?
3. Perianal skin tags are a characteristic of ulcerative colitis?
4. Microscopically, granulomas are characteristic of ulcerative colitis?
Ans-15.

1. True.
2. True.
3. False (this is seen in Crohn's disease, which is associated with skin lesions, perianal involvement, and transmural inflammation).
4. True. Pseudopolyps occur in active and chronic cases of ulcerative colitis due to excessive inflammation and regeneration, resulting in raised tissue in a background of ulceration. A large number of pseudopolyps can give a cobblestone appearance to the mucosa.

Ans-MCQ.

1. True.
2. True.
3. False (Crohn's disease).

Applied medicine. Ulcerative colitis (fulminant disease).

- Fulminant ulcerative colitis (UC) is seen in less than 10 percent of the patients, with majority being older individuals.
- Fulminant UC is more abrupt in onset and usually associated with pancolitis.
- Rectal bleeding may be extensive, requiring blood transfusion.
- Abdominal distention and tenderness are present, but rebound tenderness is indicative of peritoneal irritation.
- Serious complications include massive hemorrhage, toxic megacolon, or bowel perforation.
- Immediate hospitalization is often necessary in these patients.
- Important differential diagnosis includes infectious colitis, ischemic colitis, NSAID enteropathy, diverticular disease.

Ref: Harrison's Principles of Internal Medicine.
Q-16. This patient had a bilirubin of 23mg percent. What investigation will help differentiate medical from surgical (obstructive) jaundice?

Figure 122

1. Urine examination?
2. Abdominal ultrasound?
3. Urinary bilirubin?
4. Degree of rise in serum bilirubin?

MCQ-16. Give true or false for each of the following statements.

1. Clinically, it appears at 2 to 2.5mg percent of serum bilirubin?
2. In anemia, it becomes apparent relatively later?
3. Unconjugated bilirubin can cross the blood brain barrier?
4. Exposure to blue light renders unconjugated bilirubin more polar and water-soluble?
Ans-16.

1. True (urobilinogen is absent in obstructive jaundice).
2. True (most important investigation to demonstrate dilated ducts).
3. True (bilirubin is absent in obstructive jaundice, but present in hemolytic and hepatic diseases associated with jaundice).
4. False (in cholestatic variety of viral hepatitis, the bilirubin is as high as in obstructive jaundice).

Ans-MCQ.

1. True.
2. False (relatively early).
3. True.
4. True.

**Applied medicine. Cholestatic jaundice** (surgical causes).

- Common bile duct stone (rarely ascariasis or others causing obstruction).
- Stone in the common hepatic or its proximal left and right branches.
- Cholangiocarcinoma.
- Cancerous bile duct (CBD) stricture.
- Choledochal cyst.
- Gallbladder cancer.
- Carcinoma head of pancreas.
- Periampullary tumor or stone.
- Lymph node causing external pressure and obstruction of CBD.
- Pancreatitis.
- Mirrizi syndrome.
- Ligation of CBD (post surgically).

These patients have high direct bilirubinemia, high urinary bilirubin, and absent urobilinogen with high alkaline phosphatase. Stools are chalky white.

*Ref: Harrison’s Principles of Internal Medicine.*
Q-17. This 13-year-old male presented with this palpable reddish rash on the legs since six days followed by colicky abdominal pain with mild nausea and vomiting for three days. On admission, he also complained of pain in the knees and ankles. There was no swelling of the joints or signs of inflammation. But, the patient was having difficulty to walk with the pain. All routine labs were normal, except mild proteinuria and hematuria. What is the diagnosis?

MCQ-17. Give true or false for each of the following statements.

1. This is an IgA vasculitis?
2. Ninety percent of cases occur in the pediatric age group?
3. Purpura is accompanied by thrombocytopenia and coagulopathy?
4. Acute abdominal pain?
Ans-17. Henoch-Schonlein purpura.

Ans-MCQ.

1. True.
2. True.
3. False. Purpura is palpable with neither thrombocytopenia nor coagulopathy.
4. True.

**Applied medicine. Henoch-Schonlein purpura**

The classic tetrad includes:

1. Palpable purpura with normal platelet count and no coagulopathy.
2. Colicky acute abdominal pain (usually diffuse and due to submucosal hemorrhage and edema).
3. Arthritis or arthralgia.
4. Renal disease with hematuria or proteinuria.

Gastrointestinal symptoms are present in 50 percent children and usually develop within a week of the rash. They may even precede the rash.

There may be nausea, vomiting, and abdominal pain, and a transient paralytic ileus maybe seen. GI Complications include:

- Gastrointestinal hemorrhage (positive occult blood in over 50 percent cases).
- Bowel ischemia and necrosis.
- Intussusception is seen in 2 to 3.5 percent cases.
- Bowel perforation.
- Protein losing enteropathy.

Increased risk of progressive renal disease occurs especially in adults. The diagnosis is clinical, but can be confirmed by kidney biopsy demonstrating IgA deposition by immunofluorescence microscopy or skin biopsy showing **leukocytoclastic vasculitis**.

*Ref: UpToDate medicine.*
Q-18. This 35-year-old female presented with long history of fatigue and shortness of breath on exertion. Over six months, she had a progressive dysphagia, which increased to the extent that she could not tolerate solids or liquids. She was admitted to the emergency room (ER) and found to be anemic (Hb 5.6 with MCV 55 and MCHC 20 with low iron and ferritin). An ENT evaluation revealed pharyngeal mass causing obstructive symptoms; therefore, a tracheostomy was done and percutaneous endoscopic gastrostomy (PEG) tube was inserted. A biopsy was taken. What diagnosis do you suspect in this neglected case?

Figure 124

MCQ-18. In the preceding case, give true or false for the following statements.

1. Leukonychia is expected?
2. Anemia work-up requires also vitamin B12 and folic acid levels?
3. Endoscopy is very sensitive?
4. The disease represents a preventable cause of cancer?

Ans-MCQ.

1. False (koilonychia is expected).
2. False (with this picture and labs B12 and folic acid levels are not usually required).
3. False (endoscopy is not sensitive for cervical webs).
4. True.

Applied medicine. Plummer–Vinson syndrome.

- It is the triad of iron deficiency anemia associated with dysphagia and cervical esophageal web.
- It is associated with a high risk for esophageal or pharyngeal squamous cell carcinoma.
- Other associations of the syndrome include glossitis, angular cheilitis, koilonychias with clinical features of anemia. There may also be splenomegaly.
- It is important to note that iron replacement may result in resolution of the dysphagia and prevention of the carcinoma.
- Diagnosis of the rings may be made by videofluoroscopy with barium esophagogram using a special technique to dilate the esophagus with valsalva maneuver after swallowing a solid food bolus while in a prone position. The esophageal rings or webs are seen as slight narrowing. Endoscopy is not very sensitive. A biopsy is necessary if malignancy is suspected and also to exclude eosinophilic esophagitis.

Ref: UpToDate medicine.
Q-19. This pale looking patient with chronic liver disease due to hepatitis C infection complains of weakness, lethargy, and fatigue. What are the underlying causes of this appearance?

Figure 125

MCQ-19. Give true or false for each of the following statements.

1. Anemia related to ribavirin is via marrow suppression?
2. Anemia related to pegylated interferon is hemolytic?
3. Aplastic anemia is well documented, but rare?
4. Hemolysis may be a feature of chronic liver disease?
5. Hemolysis is seen with hypersplenism?
6. Vitamin B12 deficiency is well recognized as a cause of anemia in chronic liver disease (CLD)?
Ans-19. Anemia associated with CLD may be multifactorial. Iron deficiency, folic acid deficiency, hemolysis, aplasia of the marrow, and hypersplenism are known mechanisms.

Ans-MCQ.

1. False (it is hemolytic).
2. False (it is bone marrow suppression).
3. True.
4. True.
5. True.
6. False.

Applied medicine. Anemia in CLD.

- Anemia (hemolytic) may be related to ribavirin.
- It may also be related to pegylated interferon (marrow suppression).
- Hepatitis-associated aplastic anemia.
- Iron deficiency anemia from GI blood loss.
- It may be related to the hypersplenism in CLD.
- Poor appetite in patients with CLD may be associated with dietary deficiencies.
- Poor absorption from the intestine due to ascites and edema of the intestinal wall may also contribute.
- Alcohol intake may be associated with folic acid deficiency and macrocytic anemia.

Ref: UpToDate medicine.
**Q-20.** This 56-year-old diabetic patient gave a six-month history of gradual distension of the abdomen with low-grade fever off and on. There is history of vague abdominal pain not related to meals and not colicky with 5kg weight loss in three months. On examination, there was tense ascites. Lab showed normochromic and normocytic anemia of 9.5gm percent, with ultrasound showing no signs of CLD, with normal X-ray chest, echocardiogram, and ECG. Serum calcium was 10.2mg percent with normal electrolytes. Ascites tap showed a serum-ascites albumin gradient of less than 1.1g/dL with lymphocytosis. What investigations will establish the diagnosis?

**Figure 126**

**MCQ-20.** In relation to the diagnosis of this patient, give true or false.

1. PPD is positive in approximately 70 percent of cases?
2. Serum CA-125 may be increased in this condition?
3. X-ray chest may be positive in 20 to 30 percent cases?
4. Peritoneal fluid interferon-gamma is increased?
5. Adenosine deaminase activity of ascitic fluid has high sensitivity and specificity?
6. ELISPOT assay on peripheral blood or ascitic fluid may prove positive?
Ans-20. Send *mycobacterium* on ascitic fluid or a laparoscopically directed peritoneal biopsy or mini-laparotomy for MBTB culture and PCR.

On laparoscopy, the visceral and parietal peritoneum is studded with multiple whitish nodules or tubercles.

Ans-MCQ.

1. True.
2. True.
3. True.
4. True.
5. True.
6. True.

**Applied medicine. Tuberculous peritonitis.**

- The risk factors for the development of tuberculous peritonitis include: cirrhosis of liver, malignancy, HIV infection, diabetes, taking anti-tumor necrosis factor agents, and in patients on continuous ambulatory peritoneal dialysis (especially in the first year).
- Infection reaches the peritoneum via reactivation of latent tuberculous foci in the peritoneum, hematogenous spread, as part of miliary TB, transmurally from infection via ingestion, or spread from neighboring organs involved with TB.
- As the peritoneum is studded with tubercles, ascites collects from exudation of proteinaceous fluid from these tubercles.
- The classical doughy abdomen feeling on palpation is associated with the fibroadhesive form of tuberculous peritonitis.

*Ref: UpToDate medicine.*
Q-21. This 48-year male has history of chronic alcohol ingestion and multiple admissions to the hospital with acute jaundice. He was admitted this time with decreased level of consciousness and having vomited large quantity of blood in the vomitus. On examination, he had mild jaundice, hepatomegaly, ascites, and splenomegaly. He had bilateral parotid swelling. What is the most likely diagnosis?

![Image of hand](image)

Figure 127

MCQ-21. In relation to his disease, give true or false for the following.

1. With alcoholic cirrhosis, protein calorie malnutrition increases the risk of major complications, such as infection, encephalopathy, and ascites?
2. Patients are only selected if they are candidates for liver transplant, if they have abstained from alcohol?
3. Colchicine has not shown to be effective in alcoholic fatty liver disease?
4. Metadoxine is an antioxidant that has been shown to improve biochemical markers?
5. Silymarin use does not affect overall mortality?
**Ans-21.** Alcoholic liver disease leading to acute fatty liver to alcoholic hepatitis to cirrhosis with possible variceal bleeding and encephalopathy.

**Ans-MCQ.**

1. True.
2. True.
3. True.
4. True.
5. True.

**Applied medicine. Alcoholic cirrhosis.**

- Abuse of alcohol may cause steatosis, steatohepatitis, cirrhosis, and eventually may lead to hepatocellular carcinoma.
- In patients with alcoholic fatty liver, 8 to 20 percent will go on to develop alcoholic cirrhosis.

Risk factors for progression to cirrhosis:

- Continued use of alcohol once liver disease develops is the most important cause of progressive disease.
- Cigarette smoking.
- Obesity, especially in females
- Superimposed hepatitis B or hepatitis C infection.

Prognosis:

- With no complications (25 percent cases), five-year mortality is above 50 percent.
- If ascites is present (55 percent cases), five-year mortality is close to 60 percent.
- If bleeding varices were present (6 percent cases), five-year mortality is 65 percent.
- With ascites and variceal (4 percent cases), five-year mortality reaches 80 percent.
- With hepatic encephalopathy alone or with other complications (11 percent cases), five-year mortality is 85 percent.

*Ref: UpToDate medicine.*
Q-22. This 10-year-old boy had diarrhea since early childhood. Passing 6–10 loose stools per day without blood and mucous. There is no history of fever, but he does complain of vague abdominal pain off and on. He says that, on taking rice, eggs, fruit, and vegetables, his symptoms improve. There is no similar family history. He recently developed these severely itchy lesions on the elbow. What is the likely diagnosis?

![Figure 128](image_url)

**Figure 128**

MCQ-22. In relation to celiac disease, give true or false for each statement.

1. Celiac disease is a T-cell mediated (autoimmune) condition?
2. The average time to diagnosis of celiac disease is about five years?
3. Selective IgA deficiency confers a 10-fold risk of celiac disease?
4. The most common complication is osteoporosis?
Ans-22. Dermatitis herpetiformis associated with celiac disease.

Ans-MCQ.

1. True.
2. False. The average time to diagnosis of celiac disease is about 13 years.
3. True.
4. True.

Applied medicine. Celiac disease.

- Classical features include diarrhea or steatorrhea related to wheat products (wheat, barley, rye, and to a minor degree, oats) with villous atrophy and resolution of symptoms usually within a few weeks to months upon withdrawal of gluten-containing foods. Antibodies against gliadin and especially tissue transglutaminase is present.
- It can occur in adults (10 to 40 years), and many patients may have only minor gastrointestinal complaints.
- IgA antibodies against endomysium and the endomysial autoantigen, that is, tissue transglutaminase (tTG) are highly sensitive and specific.
- It can be associated with nutritional deficiencies, especially iron and metabolic bone disease, autoimmune disorders, hyposplenism, and higher chance of malignancy.
- The diagnosis of dermatitis herpetiformis can be confirmed by histology and anti-tTG levels are elevated in these patients. Dermatitis herpetiformis and celiac disease are associated with the same HLA-DQ. Although the celiac disease in patients with dermatitis herpetiformis is often asymptomatic, the skin lesions in most patients respond to gluten withdrawal.

Ref: Davidson principle and practice of medicine.
Q-23. What is the abnormality shown in these patients and what bedside test might indicate the diagnosis?

![Image of patients with abnormal symptoms]

Figure 129

MCQ-23. In relation to the preceding patient, give true or false for the following statements.

1. In cirrhosis of the liver, direction of blood flow in the dilated veins is toward the umbilicus?
2. In inferior vena caval obstruction, the direction of flow in the dilated veins is downward?
3. In superior vena caval obstruction, the direction of flow in the dilated veins is upward?
4. In cirrhosis of the liver with portal hypertension, caput medusae is a periumbilical swelling with blood in the dilated veins running centrifugally?
Ans-23. Dilated abnormal abdominal veins are seen on the abdomen. Demonstration of the direction of flow is important. The normal direction is centrifugal, that is, away from the center into each quadrant.

Ans-MCQ.

1. False. The direction of flow in the dilated veins associated with cirrhosis of the liver is centrifugal, that is, away from the center in each quadrant.
2. False. With superior vena caval obstruction, the direction of flow is downward.
3. False. With inferior vena caval obstruction, the direction of flow is all upward.
4. True.

Applied medicine. Esophageal varices.

- Normal HVPG is 3–5mmHg with portal hypertension at > 5mmHg. At a pressure of 8mmHg, ascites develops, and at 12mmHg, varices are associated and chances of bleeding are greater.
- With active variceal hemorrhage, the mortality is highest in the early period and declines thereafter to baseline values by six weeks. The mortality in this period is related to severe hemorrhage, early rebleeding, and development of complications, and liver failure.
- Some endoscopic markers for increased risk of variceal bleeding include:
  - Longitudinal red streaks on varices (like the ones on corduroy wales).
  - Cherry red spots are flat and discrete spots on the varices.
  - Hematocystic spots are like blood blisters on the varices.
  - Diffuse erythema.
  - Fibrin plugs are known as the white nipple sign.

*Ref: UpToDate medicine.*
Q-24. This elderly patient gave a long history of Raynaud’s phenomenon and now has classical scleroderma. What are the skin and gastrointestinal manifestations of this disease?

![Figure 130](image)

**Figure 130**

MCQ-24. Give true or false for each of the following statements.

1. About 90 percent patients with systemic sclerosis have GI involvement?
2. About half of the patients with GI involvement are asymptomatic?
3. There is an increased risk of venous thromboembolism?
4. Pulmonary involvement is seen in one-third of the cases?
Ans-24. Scleroderma is taken from the Greek words skleros (hard or indurated) and derma (skin). There is symmetric thickening, tightening, and induration of the skin involving the fingers proximal to the metacarpophalangeal or metatarsophalangeal joints. These changes may affect the entire extremity, face, neck, and trunk. Raynaud’s phenomenon is present in most patients, while sclerodactyly, digital pitting scars or a loss of substance from the finger pad is seen in more advanced cases.

Any part of GIT may be involved. Most commonly are esophageal hypomotility and incompetence of the lower esophageal sphincter (reflux and heartburn), with subsequent chronic esophagitis, strictures, Barrett’s esophagus (dysphagia and choking with recurrent pulmonary aspiration and hoarseness). Other features include alternating constipation and diarrhea from bacterial overgrowth, pseudo-obstruction, and fecal incontinence. Angiodysplasia may be present especially in the stomach “watermelon stomach” and may be responsible for GI hemorrhage and anemia.

Ans-MCQ.

1. True.
2. True.
3. True.
4. False (it is seen in 70 percent with systemic sclerosis).

Applied medicine. Scleroderma.

- Diagnostic criteria include major and minor criteria. Bibasilar pulmonary fibrosis is may be present.
- Vascular dysfunction with occlusion of the microvasculature and deposition of collagen occurs early.
- The most common cause of mortality is due to pulmonary hypertension and scleroderma renal crisis.

Ref: UpToDate medicine.
Q-25. This patient gave a history of 10kg weight loss over one year despite a good appetite. He also gave history of increased frequency of bowel movements (2–3 per day) over the last one year without blood, mucous, or tenesmus. There is no history of fever. His appearance, skin on the shin, and nails are shown. What is the diagnosis and what typical signs are shown?

Figure 131

MCQ-25. The following are the characteristic features of this disease. Give true or false.

1. Pretibial myxedema?
2. Onycholysis?
3. Nodular goiter?
4. Thyroid bruit?
Ans-25. Exophthalmos, diffuse goiter, onycholysis, and pretibial myxedema are shown in the photo. These are typical in Grave’s disease.

Ans-MCQ.

1. True.
2. True.
3. False.
4. True.

Applied medicine. Autoimmune hyperthyroidism (Grave’s disease).

- Autoimmune thyroid disease is associated with higher prevalence of celiac disease and inflammatory bowel disease (IBD).
- Other GI features include increased gut motility with hyperdefecation and malabsorption; rare patients have steatorrhea. There is weight loss despite hyperphagia. Anorexia may be present in older patients.
- Dysphagia may be present with large goiter.
- Abnormalities in liver function tests, particularly high serum alkaline phosphatase concentrations, and rarely, cholestasis.
- Frequency of urine and nocturia are present in hyperthyroidism, may be due to polydipsia and hypercalciuria.
- In women, oligomenorrhea and anovulatory infertility may be present.
- In men, extragonadal conversion of testosterone to estradiol is increased and can cause gynecomastia, reduced libido, and erectile dysfunction. Spermatogenesis is often decreased or abnormal.

Ref: UpToDate medicine.
Q-26. This 43-year male patient with BMI of 45 had elevated liver enzymes. He does not give history of jaundice or alcohol intake. There is no exposure to drugs or new medications. He is diabetic with dyslipidemia on glimipride and metformin, but uncontrolled. What is the most likely cause of his persistently elevated liver enzymes?

Figure 132

MCQ-26. In relation to obesity, give true or false for each statement.

1. A BMI of over 25 is considered obesity in Asian population?
2. A waist hip ration of < 1 is considered normal in females?
3. Medications are indicated if BMI is 27 to 29.9 if the patient also has comorbidities?
4. Bariatric surgery is recommended after failure of diet and exercise with drugs for patients with BMI > 40?
**Ans-26.** Nonalcoholic fatty liver disease (NAFLD).

**Ans-MCQ.**

1. True in Asians (in other populations it is overweight).
2. A waist hip ratio > 0.85 for females is associated with higher-risk insulin resistance, hypertension, diabetes, and dyslipidemia.
3. True.
4. True.

**Applied medicine. Nonalcoholic fatty liver disease (NAFLD).**

- NAFLD may progress to cirrhosis and is likely an important cause of cryptogenic cirrhosis. Cirrhosis develops when simple steatosis progresses to steatohepatitis and then fibrosis.
- In NAFLD, hepatic steatosis is present without evidence of inflammation.
- In NASH, hepatic steatosis is associated with hepatic inflammation that histologically is indistinguishable from alcoholic steatohepatitis.
- There is low risk of developing fibrosis in the liver if there is simple steatosis, while on the other hand, those with nonalcoholic steatohepatitis, the risk is higher (other risk factors include age, BMI, DM, elevated ALT, high visceral fat, and biopsy characteristics).
- Hepatocellular carcinoma (HCC) is associated with cirrhosis due to NAFLD.
- Recurrence of NAFLD has been reported following liver transplantation.

**Treatment options:**

- Avoid alcohol.
- There is evidence that losing weight is beneficial and safe.
- Hepatitis A and B vaccinations should be given to nonimmune patients.
• Optimize blood glucose control in diabetics and treat hyperlipidemia.
• Vitamin E (400 IU/day) for advanced fibrosis with NASH has been tried.
• Metformin does not appear to be effective for the treatment of NASH, while some studies suggest that liraglutide may be effective.

Ref: UpToDate medicine
Q-27. This lady presented with a lump in the neck over the last three
months, which has progressively become larger. It is associated with
hoarseness and dysphagia. She also complains of diarrhea since last three
weeks. It is watery, without blood or mucous. There is no abdominal pain
or fever. She has lost 8kg weight since last three months. What is the likely
diagnosis?

Figure 133

MCQ-27. In relation to thyroid cancer, give true or false for each
statement.

1. Papillary thyroid cancer represents more than 75 percent of thyroid
cancers?
2. Papillary thyroid cancer is often well differentiated, slow growing,
   and localized?
3. For follicular thyroid cancer, thyroglobulin can be used as a tumor
   marker?
4. An FNA is usually enough to diagnose follicular thyroid cancer?
Ans-27. These features are highly suggestive of thyroid malignancy. Diarrhea is especially associated with medullary carcinoma of the thyroid.

Ans-MCQ.

1. True.
2. True.
3. True.
4. False (it is impossible to distinguish between follicular adenoma and carcinoma; therefore, lobectomy is recommended if it is suggestive of adenoma). Capsular and vascular invasion are identified to diagnose follicular carcinomas.

Applied medicine. Medullary carcinoma of the thyroid (MCT).

- Arises from the parafollicular C cells of the thyroid that produce calcitonin. An FNAC is required for diagnosis.
- It is associated with early spread to regional lymph nodes.
- With MEN syndromes, it always is bilateral and multicentric.
- Other hormones like corticotropin, serotonin, melanin, and prostaglandins can also be produced by these tumors. Therefore, paraneoplastic syndromes like carcinoid syndrome and Cushing syndrome can also occur in these patients.
- There is a genetic association with MEN syndromes types 2A and 2B; therefore, family members need to be also screened.
- Do serum calcitonin level in patients suspected of MCT. There is a pentagastrin-induced rise in calcitonin levels.
- Sine pheochromocytoma may be associated; a 24-hour urinalysis for catecholamine metabolites (e.g., vanillylmandelic acid and metanephrine) may be required.
- A total thyroidectomy with a central neck dissection or modified radial neck dissection may be required.

Ref: UpToDate medicine.
Q-28. This patient with bluish sclera presented with skin hyperextensibility and recurrent subluxation of the shoulder joint. He also complained of easy bruising and poor wound healing. What is the diagnosis?

Figure 134

MCQ-28. In relation to this disease, give true or false for each statement.

1. Joint hypermobility or laxity is a characteristic feature of most types?
2. It involves predominantly proximal joints?
3. On a Beighton hypermobility scale, a score of at least 5 is defined as hypermobile joint?
4. There is a genetic defect in the formation of collagen?
**Ans-28.** Ehlers–Danlos syndrome.

**Ans-MCQ.**

1. True.
2. False (it involves both proximal and distal joints or may be seen predominantly in distal joints).
3. True (maximum score can be 9).
4. True (classic type and vascular is transmitted as autosomal dominant).

**Applied medicine. Ehlers-Danlos syndrome.**

- A positive family history should be sought.
- Skin is hyperelastic, velvety, and may have very thin cigarette paper-like scars.
- There is delayed development and muscle hypotonia. Hernias, anal prolapse, and cervical insufficiency are commonly found.
- Easy eversion of the upper eyelid due to hyperextensibility is called Metenier sign.
- Mitral valve prolapse is seen in most forms of the disease.
- Gastrointestinal and bladder diverticula may occur. Delayed gastric emptying and irritable bowel syndrome and autonomic dysfunction may be seen.
- Vascular form of Ehlers–Danlos syndrome (EDS IV) is associated with spontaneous vascular or visceral rupture. In this form, there is absence of large joint hyperextensibility.
- Arterial rupture may involve any vessel, but more commonly the abdominal vessels like the iliac, splenic, or renal arteries.
- These patients have significant risk for spontaneous rupture of internal organs.
- DD includes Marfan syndrome, cutis laxa, osteogenesis imperfect, and stickler syndrome.

*Ref: UpToDate medicine.*
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