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Stomach (Gastritis, Ulcer, Carcinoma)

Disorders of the stomach are a frequent cause of clinical disease, with inflammatory and neoplastic lesions being particularly common.

The stomach is divided into four major anatomic regions: the cardia, fundus, body, and antrum. The cardia is lined mainly by mucin-secreting *foveolar cells* that form shallow glands. The antral glands are similar but also contain endocrine cells, such as *G cells,* that release gastrin to stimulate luminal acid secretion by *parietal cells* within the gastric fundus and body. The well-developed glands of the body and fundus also contain *chief cells* that produce and secrete digestive enzymes such as pepsin.

GASTROPATHY AND ACUTE GASTRITIS

Gastritis results from mucosal injury. When neutrophils are present, the lesion is referred to as ***acute gastritis***. When cell injury and regeneration are present but inflammatory cells are rare or absent, the term ***gastropathy*** is applied.

Agents that cause gastropathy include nonsteroidal anti-inflammatory drugs, alcohol, bile, and stress-induced injury.

Acute mucosal erosion or hemorrhage, such as Curling ulcers or

lesions following disruption of gastric blood flow, for example, in portal hypertension, can also cause gastropathy that typically progresses to gastritis. The term *hypertrophic gastropathy* is applied to a specific group of diseases exemplified by Ménétrier disease(Menetrier disease is a rare disorder characterized by massive overgrowth of mucous cells (foveola) in the mucous membrane lining the stomach, resulting in large gastric folds.) and Zollinger Ellison syndrome.(is a rare **disorder** that occurs when one or more tumors form in the pancreas and duodenum. The tumors, called gastrinomas, release large amounts of gastrin that cause the stomach to produce large amounts of acid).

Both gastropathy and acute gastritis may be asymptomatic or cause variable degrees of epigastric pain, nausea, and vomiting. In more severe cases, there may be mucosal erosion, ulceration, hemorrhage, hematemesis, melena, or, rarely, massive blood loss.

Pathogenesis

The gastric lumen is strongly acidic, with a pH close to 1—more than 1 million times more acidic than the blood. This harsh environment contributes to digestion but also has the potential to damage the

mucosa. Multiple mechanisms have evolved to protect the gastric mucosa (Fig.1)

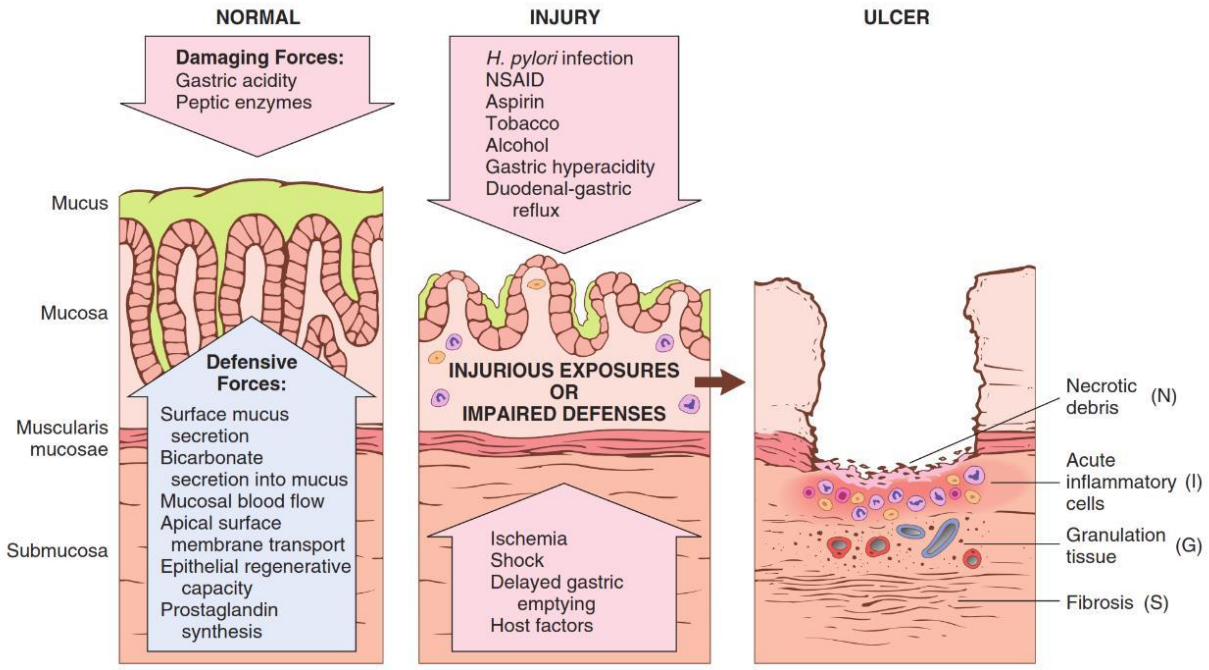

Fig. (1) Mechanisms of gastric injury and protection.

This diagram illustrates the progression from mild forms of injury to ulceration that may occur with acute or chronic gastritis. Ulcers include layers of necrotic debris (N), inflammation (I), and granulation tissue (G); scarring (S), which develops over time, is present only in chronic lesions.

Mucin secreted by surface foveolar cells forms a thin layer of mucus that prevents large food particles from directly touching the epithelium. The mucus layer also promotes formation of an “unstirred” layer of fluid over the epithelium that protects the mucosa; it has a neutral pH as a result of secretion of bicarbonate ions by surface epithelial cells. Finally, the rich blood supply of the gastric mucosa efficiently buffers and removes protons that back diffuse into the lamina propria.

Gastropathy, acute gastritis, and chronic gastritis can occur after disruption of any of these protective mechanisms.

The main causes include:

1. Nonsteroidal anti-inflammatory drugs (NSAIDs)
2. The gastric injury that occurs in uremic patients and those infected with urease-secreting *H. pylori* may be due to inhibition of gastric bicarbonate transporters by ammonium ions.
3. Reduced mucin and bicarbonate secretion.
4. Hypoxemia and decreased oxygen delivery.
5. Ingestion of harsh chemicals, particularly acids or bases.

6. Direct cellular damage also contributes to gastritis induced by excessive alcohol consumption.
7. Radiation therapy. Agents that inhibit DNA synthesis or the mitotic apparatus, including those used in cancer chemotherapy, may cause generalized mucosal damage due to insufficient epithelial renewal.

CHRONIC GASTRITIS

The most common cause of chronic gastritis is **infection with the bacillus *Helicobacter pylori*. *Autoimmune gastritis,*** typically associated with gastric atrophy, represents less than 10% of cases of chronic gastritis but is the most common cause in patients without *H. pylori* infection. **Chronic NSAID** use is a third important cause of gastritis in some populations. Less common causes include **radiation injury and chronic bile reflux.**

The ***signs and symptoms*** associated with chronic gastritis typically are less severe but more persistent than those of acute gastritis. Nausea and upper-abdominal discomfort may occur, sometimes with vomiting, but hematemesis is uncommon.

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COMPLICATIONS OF CHRONIC GASTRITIS

Here are three important complications of chronic gastritis:

1. Peptic ulcer disease,
2. Mucosal atrophy and intestinal metaplasia, and
3. Dysplasia.

Each of these is discussed shortly.

Peptic Ulcer Disease

Peptic ulcer disease (PUD) most often is associated with *H. pylori* infection or NSAID use. The imbalances of mucosal defenses and damaging forces that cause chronic gastritis are also responsible for PUD. (Fig. 1).

PUD may occur in any portion of the gastro intestinal tract exposed to acidic gastric juices but is most common in the gastric antrum and first portion of the duodenum. Peptic (acid-induced) injury may occur in the esophagus as a result of acid reflux (GERD) or acid secretion by ectopic gastric mucosa. Peptic injury in the small intestine may also be associated with gastric heterotopia, including that within a Meckel diverticulum.

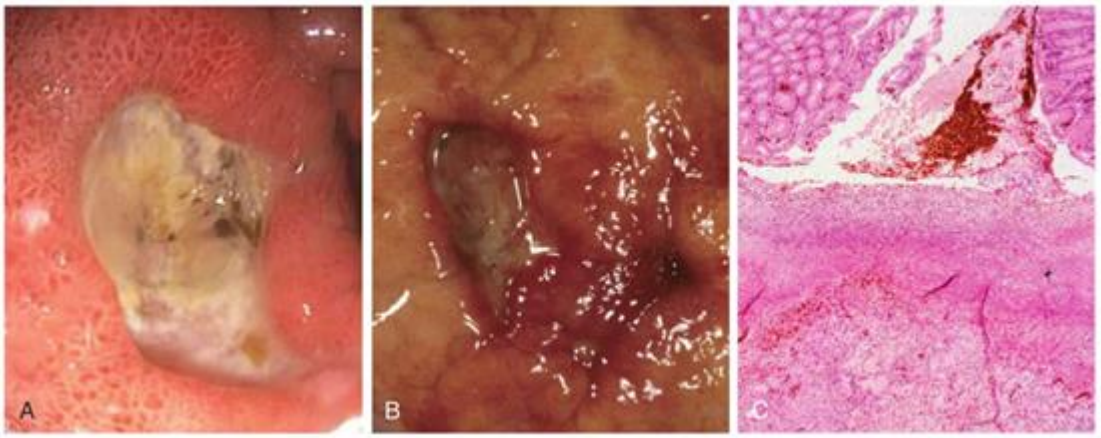

Fig. 1 Peptic ulcer disease.

(A) Endoscopic view of typical antral ulcer associated with NSAID use. (B) Gross view of a similar ulcer that was resected due to gastric perforation, presenting as free air under the diaphragm. Note the clean edges. (C) The necrotic ulcer base is composed of granulation tissue overlaid by degraded blood.

GASTRIC POLYPS AND TUMORS

Polyps are nodules or masses that project above the level of the surrounding mucosa. They are identified in up to 5% of upper gastrointestinal tract endoscopies. Polyps may develop as a result of epithelial or stromal cell hyperplasia, inflammation, ectopia, or neoplasia. Although many different types of polyps can occur in the stomach, the most common are:

- *Inflammatory and Hyperplastic Polyps*
- *Fundic Gland Polyps*
- *Gastric Adenoma*

Gastric Adenocarcinoma

Adenocarcinoma is the most common malignancy of the stomach, comprising more than 90% of all gastric cancers.

Early symptoms resemble those of chronic gastritis, including:

1. Dyspepsia,
2. Dysphagia, and
3. Nausea.

As a result, the cancer is often diagnosed at advanced stages when clinical manifestations such as **weight loss**, **anorexia**, **altered bowel habits**, **anemia**, and **hemorrhage** trigger diagnostic evaluation.

Pathogenesis:

1) *Mutations.* While the majority of gastric cancers are not hereditary, mutations identified in familial gastric cancer have provided important insights into the mechanisms of carcinogenesis in sporadic cases.

2) *H. pylori.* Chronic gastritis, most commonly due to *H. pylori*

infection, promotes the development and progression of cancers that may be induced by diverse genetic alterations.

3) *Epstein-Barr virus (EBV).* While *H. pylori* is most commonly associated with gastric cancer, approximately 10% of gastric adenocarcinomas are associated with Epstein-Barr virus (EBV) infection.

Lymphoma

Although extranodal lymphomas can arise in virtually any tissue, they do so most commonly in the gastrointestinal tract, particularly the stomach. Nearly 5% of all gastric malignancies are primary lymphomas

Neuroendocrine (Carcinoid) Tumor

Neuroendocrine tumors, also referred to as *carcinoid tumors,* arise from neuroendocrine organs (e.g., the endocrine pancreas) and neuroendocrine-differentiated gastrointestinal epithelia (e.g., G cells). A majority of these tumors are found in the gastrointestinal tract, and more than 40% occur in the small intestine.

Gastrointestinal Stromal Tumor

Gastrointestinal stromal tumor (GIST) is the most common mesenchymal tumor of the abdomen, and more than half of these tumors occur in the

stomach. A wide variety of other mesenchymal neoplasms may arise in the stomach. Many are named according to the cell type they most resemble; for example, smooth muscle tumors are called *leiomyomas* or *leiomyosarcomas,* nerve sheath tumors are termed *schwannomas,* and those resembling glomus bodies in the nail beds and at other sites are termed *glomus tumors.* These tumors are all rare

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المرحلة الرابعة

الامراض النسيجية

Lect.2.3 Histopathology 4th stage

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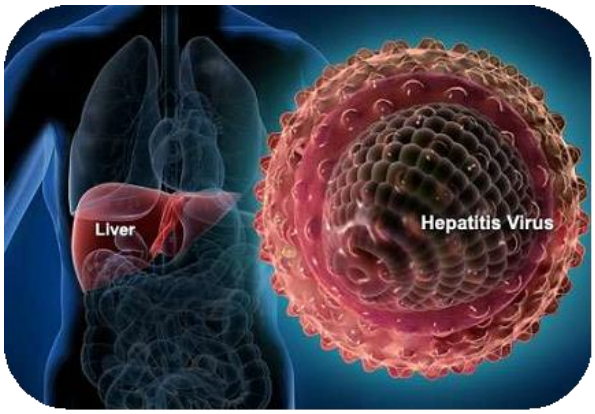

HEPATITIS

(part 1)

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INTRODUCTION

- Hepatitis is a broad term that means inflammation of liver.

- It is most commonly caused by viruses but also be caused by drugs(alcohol), chemicals, autoimmune diseases and metabolic abnormalities.

ETIOLOGY OF HEPATITIS:

Viral hepatitis
Alcoholic hepatitis
Autoimmune hepatitis
Non- alcoholic steatohepatitis(NASH)

VIRAL HEPATITIS

INTRODUCTION

- Five types of hepatitis have been identified: Hepatitis A, B, C, D , E.

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- Hepatitis A is always an acute, short-term disease, while hepatitis B, C, and D are most likely to become ongoing and chronic.

- Hepatitis E is usually acute but can be particularly dangerous in pregnant women.

- The hepatitis A and E viruses typically cause only acute, or short-term, infections.

- Other less common viruses can also cause liver disease. These include Cytomegalovirus(CMV), Herpes virus, Rubella virus, Epstein-barr virus(EBV).

INCIDENCE:

- Viral hepatitis is a major public health concern, 10 millions cases occur worldwide.

- It is nearly universal during childhood in developing countries.

- India is a hyperendemic for hepatitis A virus infection.
- Annually over 1 to 2 lakh Indians die due to illness related to HBV infection.

- Worldwide 170 million people are infected with Hepatitis C virus(HCV).

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HEPATITIS A(HEP A)

- A highly contagious liver infection caused by the hepatitis A virus(HAV).
- Hepatitis A virus is a ribonucleic acid(RNA) virus of the enterovirus family.
- It can cause acute hepatitis with jaundice.Also cause acute liver failure. It does not cause long term infection.
- Incubation period is 3-5 weeks with an average of 28 days.
- It is transmitted primarily through the fecal-oral route.
- Source of infection is Crowded conditions, poor personal hygiene, Poor sanitation, Contaminated food, water, shellfish, person with subclinical infections, infected food handlers.
- More prevalent in underdeveloped countries. People who travel to developing countries more likely to get Hep A.

****

S/S

- Fatigue
- Fever
- Abdominal pain
- Nausea
- Jaundice
- Weight loss
- Itching
- Sharp pain in right upper quadrant of abdomen
- Anorexia

D/E

- Blood tests: 2 kinds of antibodies to the virus. IgM antibodies and IgG antibodies.
- IgM antibodies show acute infection.
- IgG antibodies show previous infection or immunization.

****

MANAGEMENT:

- There are no drug therapies for the treatment of acute hepatitis A.
- Rest according to patient's level of fatigue.
- Hospitalization.
- Small, frequent feedings of a high calorie, low fat diet, proteins are restricted.
- Vit K injection if PT is prolonged.
- I.V. fluid and electrolyte replacement.
- Antiemetic drugs.

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HEPATITIS B (HEP B)

- Hepatitis B virus can cause acute and chronic infection.

- Acute hepatitis B infection may last up to 6 months (with or without symptom) and infected persons are able to pass these virus during these time.
- Chronic hepatitis B is defined as persistence of HBsAg for 6 months or more after acute infection with HBV.

Contd.

- Incubation period is 2-5 months.
- Hepatitis B virus is a complex structure with 3 distinct antigens:

1. **HBcAg-** Hepatitis B core antigen.

2. **HBsAg**- Hepatitis B surface antigen.

3. **HBeAg**- An independent protein circulating in the blood.

- Mode of transmission is mainly sexual contact. Recognized as STD. It is much more infectious than HIV.
- Further mode of transmission are Parenteral or permuscosal exposure to blood or blood products, perinatal transmission.

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- Sources of infection are Contaminated needles, syringes, blood products. Homosexual men, Tattoo or body piercing with contaminated needles.

- Occurrence is for all ages, but mostly affects young adults worldwide.

- It is the main cause of cirrhosis and hepatocellular carcinoma worldwide Abdominal pain

S/S

- Dark urine
- Fever
- Joint pain
- Loss of appetite
- Nausea/ vomiting
- Fatigue
- Jaundice.
-

D/E

- **Blood tests:** AST, ALT, ALP,GGT, proteins, PT, Urinary bilirubin, Urobilinogen, Total serum bilirubin.

****

- **Serological tests:** HBsAg, Anti-HBs, HBeAg, Anti-Hbe, Anti-HBe IgM, Anti- Hbe IgG, HBV genotyping.

- **Liver ultrasound:** Transient elastography can show the amount of liver damage

- Liver biopsy.

- Fibro tests

MANAGEMENT

- **Treatment of acute hepatitis B i**s indicated only in patients with severe hepatitis and liver failure. Rest, vitamin supplements, Avoid alcohol.

- **Treatment of chronic hepatitis B :**
  Nucleoside and Nucleotide analog such as Tenofovir, adenofovir, lamivudine.
- Interferon: Standard interferon(Intron A), Pegylated interferon (Peglntron,)
- Liver transplant.

****

HEPATITIS C(HEP C)

- Hepatitis c virus is an RNA virus.

- Incubation period is 14-180 days(average 56).
- In most cases it is transmitted through blood or blood products, prior to 1992. It is also transmitted through unprotected sex, and contaminated or unsterile needles.
- It is found in I.V. drug users and renal dialysis patients. It can result in both acute and chronic illness.
- Chronic HCV infection results in liver cirrhosis.
- There is no Vaccine for HCV.

D/E

- Hepatitis C antibody.

- HCV genotyping.

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MANAGEMENT

- In a patient with acute hepatitis C , treatment with Pegylated interferon within the 12-24 weeks of infection reduce the development of chronic hepatitis C.

- Chronic HCV: Pegylated interferon, Ribavirin Rebetol, Protease inhibitors such as incivek and Boceprevir.

HEPATITIS D OR DELTA HEPATITIS

- HDV is a defective single – stranded RNA virus that can not survive on its own. It requires hepatitis B to replicate.
- Incubation period is 2-26 weeks.
- Chronic carriers of HBV always at risk for transmission.
- Source of infection are same as HBV.
- HDV infection is only possible if a person is already infected with hepatitis
- B or a person can be infected with both viruses at the same time.

D/E

- Anti-HDV

- HDV Antigen.

TREATMENT

- Interferon.

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HEPATITIS E

- Hepatitis E virus(HEV) is an RNA virus and incubation period is 15-64 days.
- HEV has a fecal-oral transmission route.
- Source of infection is contaminated water, poor sanitation. Found in Asia, Africa and Mexico.
- More common in adults and severe in pregnant women.
- Hepatitis E usually resolves on its own within four to six weeks. Treatment focuses on supportive care, rehydration and rest.

D/E

- Anti-HEV IgM and IgG.
- HEV RNA quantification.

TREATMENT

- There is no specific treatment capable of altering the course of acute hepatitis E.
- As the disease is usually self-limiting, hospitalization is generally not required. Hospitalization is required for people

with Fulminant hepatitis

PATHOPHYSIOLOGY

- During an acute hepatitis , liver damage is mediated by cytotoxic cytokines and NK cells.
- CK and cytokines causes lysis of infected hepatocytes. It leads to cholestasis.
- Liver cells can regenerate after acute infection.
- A chronic viral infection causes chronic inflammation and cause fibrosis over decades .
- Fibrosis can lead to cirrhosis.

CLINICAL MENIFESTATIONS

- Clinical menifestations of viral hepatitis are classified into acute and chronic phases.
- manifestation of acute hepatitis are as follows: Symptom are similar to mild flu.

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Lect.2.3 Histopathology 4th stage

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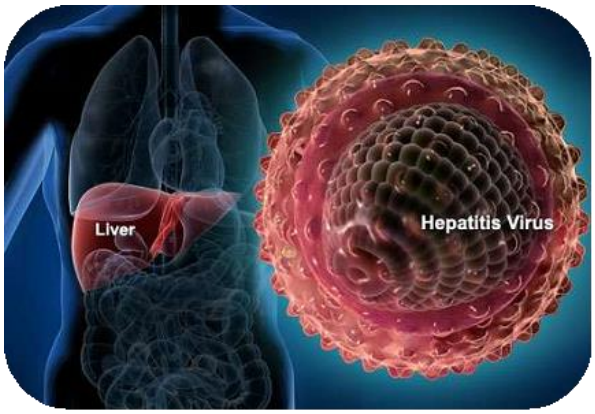

HEPATITIS

(part 2)

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ACUTE HEPATITIS

- Anorexia
- Nausea, vomiting
- Constipation or diarrhea
- Right upper quadrant discomfort
- Malaise
- Fever
- Headache
- Athralgias
- Urticaria
- Hepatomegaly
- Splenomegaly
- Weight loss
- Jaundice
- Dark urine
- Light stools
- Decreased sense of smell or taste
- Bilirubunuria

CHRONIC HEPATITIS

- Malaise
- Easy fatigability
- Hepatomegaly
- Myalgias.
- Elevated liver enzymes.

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COMPLICATIONS

- Dehydration, hypokalemia.
- Chronic carrier hepatitis.
- Cholestatic hepatitis.
- Fulminant hepatitis.
- Liver cirrhosis.
- Hepatocellular carcinoma(HBV, HCV).

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Preventive measures

HEPATITIS A:

- **GENERAL MEASURES:**

1. Hand washing
2. Proper personal hygiene
3. Environmental sanitation
4. Control and screening of food handlers
5. Active immunization: HAV vaccine.

Contd:

- **USE OF IMMUNE GLOBULIN:**

1. Early administration (1-2 weeks after exposure)

2. Prophylaxis for travelers to areas where hepatitis A is common if not vaccinated with HAV vaccine.

- **FOR HEALTH CARE PERSONNEL:** Use infection control precautions and wash hands after contact with a Patient or removal of gloves.

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HEPATITIS B & C:

- **GENERAL MEASURES:**

1. Hand washing

2. Avoid sharing toothbrushes and razors.

3. Active immunization: HBV vaccine.

4. HBIG administration for one time exposure such as needle stick, contact of mucous material.

SEXUAL TRANSMISSION:

1. Acute exposure: HBIG administration to sexual partner o HBsAg positive person.
2. Condoms use for sexual intercourse.
3. HBV vaccine series administered to uninfected sexual partners.

PERCUTANEOUS TRANSMISSION:

1. Screening for donated blood for HBsAg and Anti-HCV.
2. Use of disposable needles and syringes.

FOR HEALTH CARE PERSONNEL:

1. Reduce contact with blood or blood containing secretions.
2. Dispose the needles properly.
3. Use infection control precautions.

Autoimmune hepatitis

- It is a chronic inflammation of liver of unknown cause.

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- It is characterized by the presence of autoantibodies, serum IG.

- Majority of patients are women.

- There is an autoimmune reaction against normal hepatocytes.

- In Diagnosis serological markers are useful such as antinuclear antibodies , anti-DNA antibodies.

- Prednisone with or without azathioprine is the recommended treatment for active autoimmune hepatitis.

- Patient who do not respond to prednisone and azathioprine , Cyclosporine, Budesonide, methotrexate are used.

Alcoholic hepatitis

- Alcoholic hepatitis is a diseased, inflammatory condition of the liver caused by heavy alcohol consumption over an extended period of time.

- Diagnosis are CBC, Liver function tests, Ultrasound, CT scan, blood clotting tests, liver biopsy.

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- Patients needs to stop receive drinking.

Non-alcoholic steatohepatitis

- Non-alcoholic steatohepatitis(NASH) is a part of Non-alcoholic fatty liver disease(NAFLD).
- NAFLD is condition where fat builds up in liver not due to alcohol consumption.
- NASH is the inflammation and liver cell damage along with fat in liver.
- NASH is a serious condition that results in cirrhosis, hepatocellular cancer, liver failure.
- Risk factors for NAFLD are obesity, DM, HTN, Hyperlipidemia.
- In Clinical findings Elevated liver enzymes, liver biopsy, liver scan ,CT scan, ultrasound.
- There is no definitive treatment and therapy is directed at reduction of risk factors.
- Treatment of diabetes, weight reduction and management of Hyperlipidemia.

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*** Liver fibrosis ***

Fibrosis is the formation of an abnormally large amount of scar tissue in the liver. It occurs when the liver attempts to repair and replace damaged cells.

Fibrosis develops when the liver is repeatedly or continuously damaged. After a single episode of injury, even if severe (as with acute hepatitis), the liver commonly repairs itself by making new liver cells and attaching them to the web of connective tissue (internal structure) that is left when liver cells die. However, if injury is repeated or continuous (as occurs in chronic hepatitis), liver cells attempt to repair the damage, but the attempts result in scar tissue (fibrosis). Fibrosis can develop more rapidly when it is caused by a blockage in the bile ducts.

Fibrosis can sometimes be reversed if the cause is identified promptly and corrected. However, after months or years of repeated or continual damage, fibrosis becomes widespread and permanent. The scar tissue can form bands throughout the liver, destroying the liver's internal structure and impairing the

liver's ability to regenerate itself and to function. Such severe scarring is called cirrhosis.

Causes of Liver Fibrosis

Various disorders and drugs can repeatedly or continuously damage the liver and thus cause fibrosis (see table Some Conditions and Drugs That Can Cause Fibrosis of the Liver).

The most common causes in the United States are

- Alcohol abuse
- Viral hepatitis C
- Nonalcoholic fatty liver (fatty liver not due to alcohol use—nonalcoholic steatohepatitis)

Nonalcoholic fatty liver usually occurs in people who have excess body weight, diabetes or prediabetes, and/or high levels of fats (lipids) and cholesterol in the blood. This combination of risk factors for fatty liver disease is often referred to as metabolic syndrome. Over recent years, metabolic syndrome leading to nonalcoholic fatty liver has become increasingly common in the United States. Worldwide, viral hepatitis B is a common cause. Sometimes the cause of fibrosis is not known.

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Symptoms of Liver Fibrosis

Fibrosis itself does not cause symptoms. Symptoms may result from the disorder causing fibrosis. Also, if fibrosis progresses, cirrhosis may develop. Cirrhosis can cause complications (such as portal hypertension) that cause symptoms.

Diagnosis of Liver Fibrosis

- A doctor's evaluation
- Sometimes blood tests, imaging tests, or both
- Sometimes liver biopsy

Doctors suspect fibrosis when people have a disorder or take a drug that could cause fibrosis or when routine blood tests to evaluate the liver indicate that the liver is damaged or is malfunctioning. Tests are then done to confirm the diagnosis, and if fibrosis is present, tests are done to determine its severity. These tests can include imaging tests, blood tests, liver biopsy, and sometimes specialized imaging tests to determine how stiff the liver is.

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Imaging tests such as ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI) do not detect early or moderately advanced fibrosis. However, these tests may show abnormalities that can accompany cirrhosis and portal hypertension (such as an enlarged spleen or varices).

Certain combinations of blood tests can distinguish between two levels of fibrosis:

Liver biopsy is the most reliable way to detect and stage (determine the amount of) fibrosis and to identify the disorder causing fibrosis. Biopsy is often done to confirm the diagnosis, to identify the cause of the liver disease, to stage the level of fibrosis or the presence of cirrhosis, as well as to assess the response to the treatment. Because liver biopsy is invasive and can cause complications, doctors may first do blood tests and imaging tests to determine the level of fibrosis and then decide about the need for a liver biopsy. Doctors are increasingly relying on certain specialized imaging tests as noninvasive alternatives to biopsy.

Specialized imaging tests can determine how stiff the liver is. The stiffer liver tissue is, the more severe fibrosis is likely to be. These tests (transient elastography, magnetic resonance

elastography, and acoustic radiation force impulse imaging) use sound waves, applied to the abdomen, to determine how stiff the liver tissue is. Unlike liver biopsy, these tests are not invasive and thus have some advantage. Transient elastography and magnetic resonance elastography are being used in people with various liver disorders to diagnose and stage the fibrosis. Additionally, these tests are used to assess the amount of liver fat in people with fatty liver disease. Conventional ultrasonography can be unreliable because results depend on the skill of the person doing the procedure. In contrast, these specialized imaging tests report their measurement in numbers, allowing objective assessment.

Treatment of Liver Fibrosis

Doctors focus on treating the cause, which often stops or slows further scarring of the liver and sometimes results in improvement. Such treatment may include

- Using antiviral drugs to eliminate the virus if people have chronic viral hepatitis
- Not drinking alcohol if people have alcoholic liver disease

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- Using drugs to remove heavy metals if people have iron overload (hemochromatosis) or Wilson disease (which causes copper to accumulate)
- Stopping any drug or supplement that is causing fibrosis
- Removing or dissolving a blockage in the bile ducts
- Losing weight and controlling blood sugar and lipid levels in people with nonalcoholic fatty liver

No available drug stops the formation of scar tissue effectively and safely. However, drugs that may reduce fibrosis are currently under study. Silymarin, in milk thistle, or coffee may help protect the liver against fibrosis, but the evidence is not enough to recommend either as treatment.

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***Liver cirrhosis ***

Cirrhosis is a late stage of scarring (fibrosis) of the liver caused by many forms of liver diseases and conditions, such as hepatitis and chronic alcoholism as shown in figure (1).

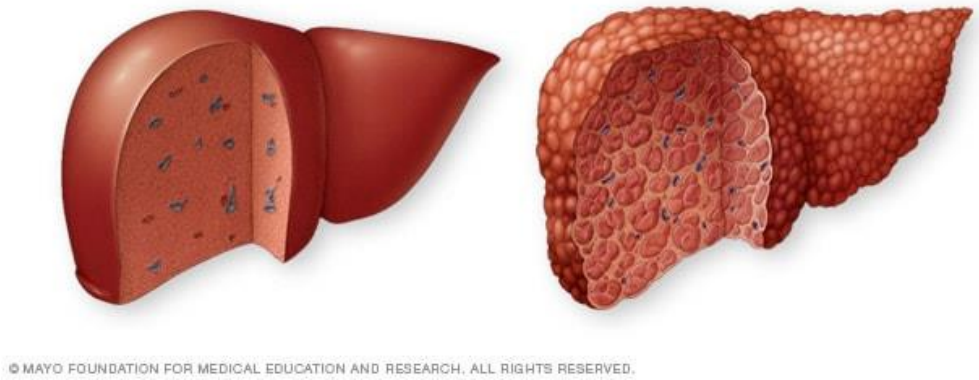

Figure (1): Normal liver vs. liver cirrhosis .

Each time your liver is injured — whether by disease, excessive alcohol consumption or another cause — it tries to repair itself. In the process, scar tissue forms. As cirrhosis progresses, more and more scar tissue forms, making it difficult for the liver to function (decompensated cirrhosis). Advanced cirrhosis is life-threatening.

The liver damage done by cirrhosis generally can't be undone. But if liver cirrhosis is diagnosed early and the cause is treated, further damage can be limited and, rarely, reversed.

Symptoms:

Cirrhosis often has no signs or symptoms until liver damage is extensive. When signs and symptoms do occur, they may include:

- Fatigue

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- Easily bleeding or bruising
- Loss of appetite
- Nausea
- Swelling in your legs, feet or ankles (edema)
- Weight loss
- Itchy skin
- Yellow discoloration in the skin and eyes (jaundice)
- Fluid accumulation in your abdomen (ascites)
- Spiderlike blood vessels on your skin
- Redness in the palms of the hands
- Confusion, drowsiness and slurred speech (hepatic encephalopathy)

Causes:

A wide range of diseases and conditions can damage the liver and lead to cirrhosis.

Some of the causes include:

- Chronic alcohol abuse
- Chronic viral hepatitis (hepatitis B, C and D)
- Fat accumulating in the liver (nonalcoholic fatty liver disease)
- Iron buildup in the body (hemochromatosis)
- Cystic fibrosis
- Copper accumulated in the liver (Wilson's disease)
- Poorly formed bile ducts (biliary atresia)
- Alpha-1 antitrypsin deficiency
- Inherited disorders of sugar metabolism (galactosemia or glycogen storage disease)
- Genetic digestive disorder (Alagille syndrome)

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- Liver disease caused by your body's immune system (autoimmune hepatitis)
- Destruction of the bile ducts (primary biliary cirrhosis)
- Hardening and scarring of the bile ducts (primary sclerosing cholangitis
- Infection, such as syphilis or brucellosis
- Medications, including methotrexate or isoniazid

Risk factors:

- **Drinking too much alcohol.** Excessive alcohol consumption is a risk factor for cirrhosis.
- **Being overweight.** Being obese increases your risk of conditions that may lead to cirrhosis, such as nonalcoholic fatty liver disease and nonalcoholic steatohepatitis.
- **Having viral hepatitis.** Not everyone with chronic hepatitis will develop cirrhosis, but it's one of the world's leading causes of liver disease.

Complications:

Complications of cirrhosis can include:

- **High blood pressure in the veins that supply the liver (portal hypertension).** Cirrhosis slows the normal flow of blood through the liver, thus increasing pressure in the vein that brings blood to the liver from the intestines and spleen.
- **Swelling in the legs and abdomen.** The increased pressure in the portal vein can cause fluid to accumulate in the legs (edema) and in the abdomen (ascites). Edema and ascites also may result from

the inability of the liver to make enough of certain blood proteins, such as albumin.

- **Enlargement of the spleen (splenomegaly).** Portal hypertension can also cause changes to and swelling of the spleen, and trapping of white blood cells and platelets. Decreased white blood cells and platelets in your blood can be the first sign of cirrhosis.
- **Bleeding.** Portal hypertension can cause blood to be redirected to smaller veins. Strained by the extra pressure, these smaller veins can burst, causing serious bleeding. Portal hypertension may cause enlarged veins (varices) in the esophagus (esophageal varices) or the stomach (gastric varices) and lead to life-threatening bleeding. If the liver can't make enough clotting factors, this also can contribute to continued bleeding.
- **Infections.** If you have cirrhosis, your body may have difficulty fighting infections. Ascites can lead to bacterial peritonitis, a serious infection.
- **Malnutrition.** Cirrhosis may make it more difficult for your body to process nutrients, leading to weakness and weight loss.
- **Buildup of toxins in the brain (hepatic encephalopathy).** A liver damaged by cirrhosis isn't able to clear toxins from the blood as well as a healthy liver can. These toxins can then build up in the brain and cause mental confusion and difficulty concentrating. With time, hepatic encephalopathy can progress to unresponsiveness or coma.
- **Jaundice.** Jaundice occurs when the diseased liver doesn't remove enough bilirubin, a blood waste product, from your blood. Jaundice causes yellowing of the skin and whites of the eyes and darkening of urine.
- **Bone disease.** Some people with cirrhosis lose bone strength and are at greater risk of fractures.

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- **Increased risk of liver cancer.** A large proportion of people who develop liver cancer have pre-existing cirrhosis.
- **Acute-on-chronic cirrhosis.** Some people end up experiencing multiorgan failure. Researchers now believe this is a distinct complication in some people who have cirrhosis, but they don't fully understand its causes.

Prevention:

Reduce your risk of cirrhosis by taking these steps to care for your liver:

- Do not drink alcohol if you have cirrhosis.
- Eat a healthy diet. .
- Maintain a healthy weight.
- Reduce your risk of hepatitis.

Diagnosis:

People with early-stage cirrhosis of the liver usually don't have symptoms. Often, cirrhosis is first detected through a routine blood test or checkup. To help confirm a diagnosis, a combination of laboratory and imaging tests is usually done which included:

- **Laboratory tests.** Your doctor may order blood tests to check for signs of liver malfunction, such as excess bilirubin, as well as for certain enzymes that may indicate liver damage. To assess kidney function, your blood is checked for creatinine. You'll be screened for the hepatitis viruses. Your international normalized ratio (INR) is also checked for your blood's ability to clot.

Based on the blood test results, your doctor may be able to diagnose the underlying cause of cirrhosis. He or she can also use blood tests to help identify how serious your cirrhosis is.

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- **Imaging tests.** Magnetic resonance elastography (MRE) may be recommended. This noninvasive advanced imaging test detects hardening or stiffening of the liver. Other imaging tests, such as MRI, CT and ultrasound, may also be done.
- **Biopsy.** A tissue sample (biopsy) is not necessarily needed for diagnosis. However, your doctor may use it to identify the severity, extent and cause of liver damage.

Treatment:

Two type of treatments which is :

1. **Treatment for the underlying cause of cirrhosis**

In early cirrhosis, it may be possible to minimize damage to the liver by treating the underlying cause. The options include:

- Treatment for alcohol dependency.
- Weight loss.
- Medications to control hepatitisMedications to control other causes and symptoms of cirrhosis.

2. **Treatment for complications of cirrhosis**

Your doctor will work to treat any complications of cirrhosis, including:

- Excess fluid in your body.
- Portal hypertension.
- Infections.
- Increased liver cancer risk.
- Hepatic encephalopathy.
- Liver transplant surgery

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Gallbladder Disease and Pancreatitis

What is gallbladder disease?

Gallbladder disease includes inflammation, infection, stones or blockage of the gallbladder. The gallbladder is a sac located under the liver. It stores and concentrates bile produced in the liver. Bile aids in the digestion of fat and is released from the gallbladder into the upper small intestine in response to food (especially fats). Types of gallbladder disease include:

- Cholecystitis (inflammation of the gallbladder)
- Gallstones
- Chronic acalculous gallbladder disease (in which the natural movements needed to empty the gallbladder do not work well)
- Gangrene or abscesses
- Growths of tissue in the gallbladder
- Congenital defects of the gallbladder
- Sclerosing cholangitis
- Tumors of the gallbladder and bile ducts

Symptoms:

most common symptom of gallbladder disease is

- pain in the upper right abdomen near the rib cage(intermediated pain)
- acute cholecystitis,
- Nausea and vomiting may occur.
- Chronic gallbladder disease involves gallstones and mild inflammation. In such cases, the gallbladder may become scarred and stiff.

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- Jaundice
- Dark urine, lighter stools or both
- Rapid heartbeat and abrupt blood pressure drop
- Fever, chills, nausea and vomiting, with severe pain in the upper right abdomen.

Diagnosis:

By using :

- Blood tests
- Ultrasound and other imaging techniques.

Treatment:

Surgery may be warranted to remove the gallbladder if the patient has gallstones or the gallbladder is not functioning normally. Most of the time this can be performed either laparoscopically (through small incisions) or with robotic-assisted surgery, both as outpatient procedures

******Pancreatitis******

What Is Pancreatitis?

Pancreatitis is a disease in which your pancreas becomes inflamed. The pancreas is a large gland behind your stomach and next to your small intestine. Your pancreas does two main things:

- It releases powerful digestive enzymes into your small intestine to help you digest food.
- It releases insulin and glucagon into your bloodstream. These hormones help your body control how it uses food for energy.

Your pancreas can be damaged when digestive enzymes begin working before your pancreas releases them.

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What Are the Types of Pancreatitis?

The two forms of pancreatitis are acute and chronic.

- ***Acute pancreatitis*** is sudden inflammation that lasts a short time. It can range from mild discomfort to a severe, life-threatening illness. Most people with acute pancreatitis recover completely after getting the right treatment. In severe cases, acute pancreatitis can cause bleeding, serious tissue damage, infection, and cysts. Severe pancreatitis can also harm other vital organs such as the heart, lungs, and kidneys.
- ***Chronic pancreatitis is*** long-lasting inflammation. It most often happens after an episode of acute pancreatitis. Another top cause is drinking lots of alcohol for a long period of time. Damage to your pancreas from heavy alcohol use may not cause symptoms for many years, but then you may suddenly have severe pancreatitis symptoms.

What Are the Symptoms of Pancreatitis?

Symptoms of acute pancreatitis

- Fever
- Higher heart rate
- Nausea and vomiting
- Swollen and tender belly
- Pain in the upper part of your belly that goes into your back. Eating may make it worse, especially foods high in fat.

Symptoms of chronic pancreatitis

The symptoms of chronic pancreatitis are similar to those of acute pancreatitis. But you may also have:

- Constant pain in your upper belly that radiates to your back. This pain may be disabling.
- Diarrhea and weight loss because your pancreas isn’t releasing enough enzymes to break down food
- Upset stomach and vomiting