GIT BLock Final REVISION

Important note: **Please check out this link before viewing the file to know if there are any additions or changes. The same link will be used for all of our work: Pathology Edit.**

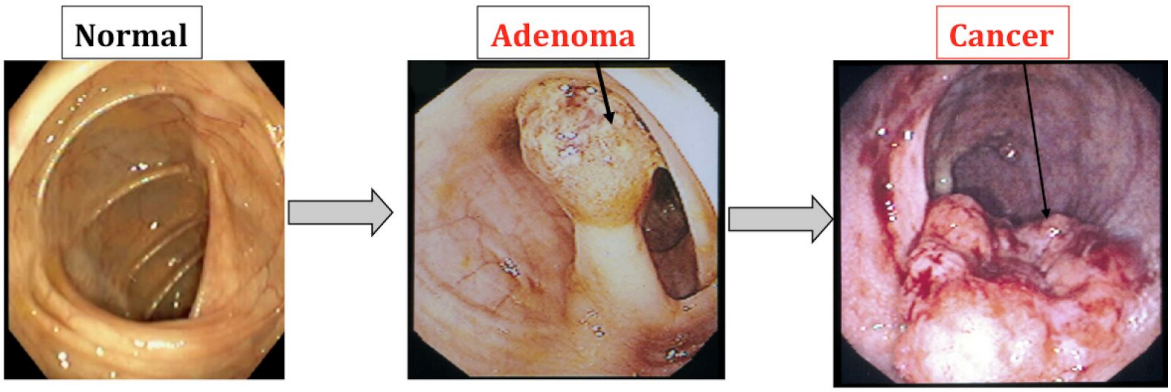
1- Inflammatory Bowel Diseases:

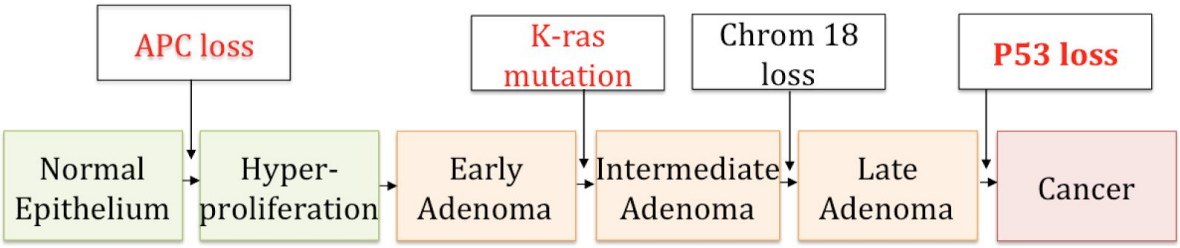
	Crohn's	Ulcerative Colitis
Site	Any part of the GIT	Colon only
Pattern	Skip areas of normal mucosa	Diffuse involvement of mucosa
Symptoms	Right lower quadrant pain (ileum) with non bloody diarrhea.	Left Lower quadrant (rectum) with bloody diarrhea.
Depth of the ulcer	Deep ulcers (fissure)	Superficial ulcers
Extent of inflammation	Transmural inflammation	Mucosal inflammation only
Inflammation	Lymphoid aggregates with granulomas	Crypts abscesses with neutrophils
Fistula Formation	Yes	No
Creeping mesenteric Fat	Yes	No
Fibrous thickening wall	Yes	No
Granulomas	Yes	No
Dysplasia	rare	Common
Carcinoma	rare	More Common (10%)
Mucosal appearance	**Cobblestone**	**Pseudopolyps**
Bowel wall	Thickened wall narrow margin	Thin wall Dilated lumen
Complication	-Fistula formation -Bowel perforation -Stricture formation	-Haemorrhage -Toxic Megacolon -Systemic effects

2- Colonic Tumors And Polyps:

Polyps	Incidence	Region	Features	Prognosis
Non-neoplastic polyps 90%				
Hyperplastic polyps	**Adults.**	**rectosigmoid**	- **Sawtooth** surface. - **Star shaped** crypts. - **Well-formed glands and crypts.**	No malignant potential.
Hamartomatous polyps (Juvenile)	**Children** under 5.	**rectum**	Affects the glands and lamina propria	
Hamartomatous polyps (Peutz-Jeghers polyps)	Rare, autosomal dominant.	-	- large and pedunculated hamartomatous polyps. - Mucosal and cutaneous pigmentation.	Carcinoma of the pancreas, breast, lung, ovary and uterus.
Inflammatory polyps	Longstanding IBD, especially in chronic ulcerative colitis.	-	**Pseudopolyps**	-
Neoplastic polyps Adenomatous Polyp(adenoma) 10% **Epithelium proliferation and dysplasia**				
Tubular adenoma	75% of all neoplastic polyps.	Sigmoid colon	Villous architecture less than 25%.	-
Tubulovillous adenoma	20%–30% of polyps	-	- Intermediate in size. - between tubular and villous adenomas.	-
Villous adenoma	The least common. Age: 60 to 65 years.	rectosigmoid area	● Villous architecture over 50%. 1. rectal bleeding 2. anemia 3. hypokalemia 4. hypoalbuminemia	Malignant transformation.
Familial Polyposis Syndrome	- **Genetic** tendencies to develop neoplastic polyps → colorectal cancer by midlife. - **APC** (located on chromosome 5) gene defect. - Innumerable polyps (500 to 2500) Diffused in all of the alimentary tract.			

Adenoma to Carcinoma Pathway:





- **APC (Adenomatous polyposis coli) gene mutation** → increased risk for formation of polyp.
- **K-ras mutation** → formation of polyp.
- **P53 mutation** → progression to carcinoma.

Tumor	Incidence	Features	Classification
Tumors of the large intestines			
Adenocarcinoma of the colon	- Most common (98%). - Peaks at 60 to 70 years of age	**Predisposing factors:** - IBD, adenomas , polyposis syndrome. - Low fibre diet. - High fat content. - Alcohol. - Reduced intake of vit A,C & E.	1. The APC/B-catenin pathway (85 %) 2. The DNA mismatch repair genes pathway: - **(MSH2,MSH6,MLH1,PMS 1, PMS2).** - Give rise to the **hereditary non polyposis colon carcinoma** (HNPCC).
Colorectal Carcinoma	70% are in the rectum, rectosigmoid and sigmoid colon.	**If located closer to the anus:** change in bowel habit, feeling of incomplete defecation, PR bleeding	Left-sided carcinomas: **obstruction**. Right-sided carcinomas: **obstruction is uncommon**.

Tumors of the small intestines Carcinoid > adenocarcinomas > lymphomas > leiomyosarcomas		
Tumor	**Incidence**	**features**
Carcinoid Tumors	From endocrine cells of the GIT mucosa.	Neurosecretory electron dense bodies in the cytoplasm **Clinical features:** - Asymptomatic. - May cause obstruction, intussusception or bleeding. - May elaborate hormones: Zollinger-Ellison, Cushing's carcinoid or other syndromes.
Carcinoid syndrome		- Paroxysmal flushing. - Asthma-like wheezing, right-sided heart failure, attacks of watery diarrhea, abdominal pain. - The principal chemical mediator is **serotonin.**
Lymphoma	In any part of the intestine	Low-grade lymphomas arising in (MALT) lymphoma or high-grade non-Hodgkin's lymphomas of B cell type.

3- Liver Cirrhosis and Complications:

Characteristics of cirrhosis:

1. **Fibrosis.**
2. **Nodules** containing regenerating hepatocytes encircled by fibrosis.
3. **Disruption** of the architecture of the **entire liver.**

Classification of cirrhosis: (based on the underlying etiology)

1. **Alcoholic liver disease** **most common*** (Morphology → micronodular cirrhosis)
2. **Viral hepatitis**
3. **Cryptogenic cirrhosis**

Pathogenesis of cirrhosis:

- **Progressive fibrosis** and **Reorganization** of the vascular microarchitecture of the liver.

1- Stellate cells **'ito cells'** are activated → transform into **myofibroblast-like** cells → produce **excess collagen** that is deposited in 'the space of disse' perisinusoidal space → **loss of fenestrations** → prevents the free exchange of solutes between hepatocytes and plasma. → **Reorganization**

2- Excess Types I and III collagen in the lobule due to:

Activation of endogenous cells ⇒ production of cytokines ⇒ inflammation ⇒ disruption of the normal extracellular matrix ⇒ stimulation of stellate cells by toxins ⇒ collagen formation.→ **Progressive fibrosis**

Clinical Features:

- **Jaundice.**
- **Hepatic failure.**
- All forms of cirrhosis may be clinically **silent.**

Mechanism of most cirrhotic death: **1-Progressive** liver failure

2-Development hepatocellular carcinoma 3- A Complication from portal hypertension

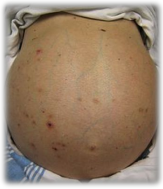
Chronic Hepatitis:

- Hepatocyte injury, necrosis, and regeneration.
- **Portal tract Inflammation in three forms:**
  1. Confined to portal tracts.
  2. Spillover into adjacent parenchyma, with necrosis of hepatocytes "interface hepatitis[1]".
  3. Bridging inflammation and necrosis.
- **Fibrosis**
- **HBV:** **"ground-glass"** hepatocytes, "sanded" nuclei.
- **HCV:** **bile duct damage, lymphoid aggregate** formation.
- **Alcoholic hepatitis:** **Mallory bodies.**

[1] is a process of inflammation and erosion of the hepatic parenchyma at its junction with portal tracts or fibrous septa.

- **Cirrhosis** is The end-stage outcome.

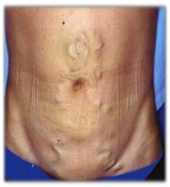
Complications



A- Portal hypertension:

1. **Ascites:**

   Sinusoidal hypertension and hypoalbuminemia → drives fluid into the space of Disse → Leakage of hepatic lymph into the peritoneal cavity.
2. **Splenomegaly (hypersplenism).**
3. **Portosystemic venous shunts:**
   - Rectum → hemorrhoids.
   - Abdominal wall → **caput medusae.**
   - Cardioesophageal junction → **esophagogastric varices/ esophageal varices.**



Esophageal Varices:

- **Varices:** congested **subepithelial and submucosal** venous plexus within the **distal** esophagus.
- **Esophageal varices** is important cause of **esophageal bleeding** (Variceal bleeding).
- Half of patients die from first episode → hemorrhage or hypovolemic shock.

Pathogenesis of esophageal varices:

Portal hypertension → development of collateral channels at site → portal and caval systems communicate→ they will allow some drainage to occur→ but they lead to varices.

Morphology: (detected by venogram.)

- Varices may not be grossly obvious in surgical or postmortem specimens, because they collapse in the absence of blood flow.
- Variceal rupture results in hemorrhage into the lumen or esophageal wall, in which case the overlying mucosa appears ulcerated and necrotic.

Clinical features:

- Asymptomatic or rupture → massive **hematemesis**.
- **Increased tension** in progressively dilated veins.
- **Increased vascular hydrostatic pressure** associated with vomiting are likely to contribute.

B- Liver failure

1. **Jaundice and icterus → Bilirubin overproduction, hepatitis** and **obstruction** of the flow of bile.
2. **Spider angiomas, hypogonadism, gynecomastia** → Hyperestrogenemia.
3. **Hepatic encephalopathy:**
   - Appears to be associated with **elevated blood ammonia** levels (important sign of hepatitis), which impair neuronal function and promote generalized brain edema.
4. **Hepatorenal syndrome:**
   - There will be no intrinsic morphologic or functional causes for the renal failure.

Renal failure due to :

1-Decrease in renal perfusion pressure → due to systemic vasodilatation

2-Activation of sympathetic nervous system → vasoconstriction of afferent renal arterioles

3-increase synthesis of renal vaso active mediators → cause decrease in glomerular filtration.

C. Hepatocellular carcinoma.

4- Cancer of Liver And Pancreas:

	Incidence	Etiology	Morphology	Prognosis
Hepatocellular Carcinomas	- Male. - More than 85% of cases of HCC → chronic HBV infection. - Western: cirrhosis 85-90% + chronic liver diseases	1. HBV & HCV. 2. Cirrhosis. 3. Chronic alcoholism. 4. Aflatoxins from aspergillus. 5. Tyrosinemia & hemochromatosis	- In well-differentiated tumors, cells that are recognizable as hepatocytic in origin. - Positive for alpha-fetoprotein - Satellite nodules & greenish cast	Death occurs from: 1. Cachexia. 2. Variceal bleeding. 3. Liver failure with hepatic coma. 4. Rupture of the tumor with hemorrhage
Fibrolamellar carcinoma	- A distinctive variant of hepatocellular carcinoma. - Young male and female adults (20 to 40 years of age).	No association with HBV or cirrhosis	well-differentiated polygonal cells growing in nests or cords and separated by parallel lamellae of dense collagen bundles	**Better prognosis**
Hepatic adenoma	-	**Oral contraceptive drugs.**	Solitary, sharply demarcated mass up to 40 cm.	30% peritoneal cavity bleeding → hypovolemic shock → emergency treatment.
Cholangio-carcinoma	malignancy of the biliary tree, arising from bile ducts	- Primary sclerosing cholangitis. - Congenital fibropolycystic - Exposure to Thorotrast. - In the Orient : Clonorchis sinensis	- Cholangiocarcinoma resemble adenocarcinomas. - Well to moderately differentiated. - Rarely bile stained	- **Late detection:** as obstruction to bile flow or as a symptomatic liver mass - Prognosis is poor - Alpha-fetoprotein is not elevated
Angiosarcoma	Malignant tumor of endothelial cells	- Cirrhosis 20-40% - exposure to vinyl chloride and thorotrast	-	-
pancreatic carcinoma	- Ductal epithelial cells. - Most common: ductal adenocarcinoma. - Less common: 1. Acinar cell carcinomas. 2. Adenosquamous carcinomas. 3. Undifferentiated carcinomas.	- 6th to 8th decade. - Blacks. - Males. - Diabetics. - Cigarette smoking. - K-RAS mutation.	60% arise in the head of the gland - Highly invasive. - Desmoplastic response	- One of the highest mortality rates of any cancer. - Jaundice, weight loss, pain ,massive metastasis to liver and migratory thrombophlebitis.

5- Cholecystitis:

1-Cholelithiasis (GallStones)

	Cholesterol stones 80%. crystalline cholesterol monohydrate.	**Pigment stones** 20% bilirubin calcium salts
Risk factors	Age, Female,Obesity, Rapid weight reduction, Gallbladder stasis.	- Chronic hemolytic syndromes. - Biliary infection. - Gastrointestinal disorders:
Pathogenesis	- **Supersaturation** of bile with cholesterol. - Gallbladder **hypomotility**. - **Mucus hypersecretion** in the gallbladder.	**Based on:** 1. The presence of unconjugated bilirubin (poorly soluble in water) such as chronic hemolytic conditions. 2. Precipitation of calcium bilirubin salts such as infection of the biliary tract with: - *Escherichia coli.* - *Ascaris lumbricoides.* - Liver fluke *Opisthorchis sinensis.*
Morphology	Pale yellow stones composed largely of cholesterol are radiolucent, only 10% to 20% of cholesterol stones are radiopaque.	Calcium carbonates 50% to 75% of black stones are radiopaque.
Cholesterolosis	An incidental finding associated with cholelothiasis. Excessive accumulation of cholesterol esters within the lamina propria of the gallbladder "strawberry gallbladder".	
Clinical features	• 70% to 80% of patients are asymptomatic. • Symptoms: Colicky rightupper quadrant pain that may radiate to the right shoulder or the back. • It is usually due to obstruction of bile ducts by passing stones.	
Complications	Empyema - Perforation - Fistula -Inflammation of the biliary tree (cholangitis) - Pancreatitis. Occasionally, a large stone may erode directly into an adjacent loop of small bowel, generating intestinal obstruction ("gallstone ileus").	

2-CHOLECYSTITIS

Inflammation of the gallbladder may be acute, chronic, or acute superimposed on chronic. It almost always occurs in association with gallstones.

<table>
<tr><th></th><th colspan="2">Acute Cholecystitis</th><th>Chronic cholecystitis</th></tr>
<tr><td rowspan="2">Type</td><td>Calculous</td><td>Acalculous</td><td rowspan="2">Associated with cholelithiasis in over 90% of cases.</td></tr>
<tr><td>Obstruction of the neck or cystic duct.</td><td>Occurs in the absence of gallstones.</td></tr>
<tr><td>Pathogenesis</td><td>Results from chemical irritation and inflammation of the obstructed gallbladder.</td><td>Generally in severely ill patient.</td><td>Sequel to repeated bouts of acute cholecystitis.</td></tr>
<tr><td rowspan="2">Clinical Features</td><td colspan="2">• Progressive right upper quadrant or epigastric pain.
• Mild fever.</td><td rowspan="2">Range from biliary colic to indolent right upper quadrant pain and epigastric distress. Patients often have intolerance to fatty food, belching and postprandial epigastric distress, sometimes include nausea and vomiting.</td></tr>
<tr><td>Sudden and constitute acute surgical emergency or may present with mild symptoms that resolve without medical intervention.</td><td>Symptoms are obscured by the underlying conditions precipitating the attacks.</td></tr>
<tr><td>Morphology</td><td colspan="2">● Gallbladder is usually enlarged and tense.
● Bile is cloudy to turbid → contain fibrin + pus + hemorrhage. (When the contained exudate is pure pus the condition is referred to as → Empyema of the gallbladder).
- <u>Mild cases:</u> gallbladder wall is thickened, edematous and hyperemic.
- <u>Severe cases:</u> It's transformed to green-black → necrotic organ called → gangrenous cholecystitis with perforation.</td><td>It's extremely variable, but sometimes could be:
•Contracted (fibrosis).
•Normal in size.
•Enlarged (from obstruction).</td></tr>
<tr><td>Complications</td><td colspan="3">• Bacterial superinfection with cholangitis or sepsis.
• GB perforation & local abscess formation.
• GB rupture with diffuse peritonitis.
• Biliary enteric fistula with drainage of bile into adjacent organs.</td></tr>
</table>

MCQs:

1. **A 62 year old man is brought to the emergency room in a disoriented state .physical examination reveals jaundice , splenomegaly , and ascites , spider angiomata. The abdomen displays dilated paraumbilical veins. Serum levels of ALT , AST , alkaline phosphatase , and bilirubin are all mildly elevated. Soon after admission, the patient vomits a large amount of blood. Which of the following is the most likely underlying cause of hematemesis in this patient?**

A. Acute alcoholic hepatitis.
B. Acute gastritis.
C. Cirrhosis.
D. Duodenal ulcer.
E. Mallory-weiss tear.

ANS: C

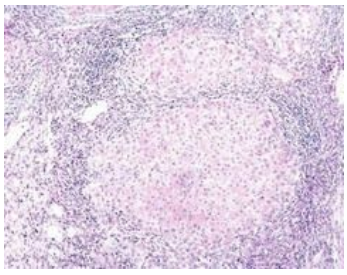
2. **For the patient described in the previous question, which of the following pathophysiologic mechanisms is most directly associated with the development of ascites?**

A. Decreased aldosterone secretion.
B. Decreased intravascular volume.
C. Hyperalbuminemia.
D. Increased intravascular oncotic pressure.
E. Increased portal hydrostatic pressure.

ANS: E

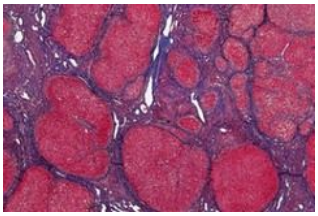
3. **A 30-year-old man presents with a 9 months history of fatigue and recurrent fever. He also complains of yellow skin and sclerae, abdominal tenderness, and dark urine. Physical examination reveals jaundice and mild hepatomegaly. Laboratory studies demonstrate elevated serum bilirubin (3.1 mg/dL), decreased serum albumin (2.5 g/dL), and prolonged prothrombin time (17 seconds). Serologic tests reveal antibodies to hepatitis B core antigen (IgG anti-HBcAg). The serum is positive for HBsAg and HBeAg. A liver biopsy is shown in the image. What is the most likely diagnosis?**

A. Acute hepatitis B.
B. Alcoholic hepatitis.
C. Chronic hepatitis B.
D. Delta virus infection.
E. Subacute hepatic necrosis secondary to hepatitis B infection.



ANS: C

4. **A liver biopsy is shown in the image. What blood test will confirm diagnosis of hepatic coma?**



A. Alkaline phosphatase.
B. Alanine amino transferase.
C. Ammonia.
D. Bilirubin.
E. Urea nitrogen.

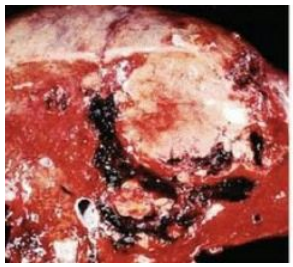
ANS: C

5. **Histologic examination of the patient's kidney with hepatorenal syndrome would most likely show which of the following?**

A. Interstitial nephritis.
B. Membranous nephropathy.
C. No histologic changes.
D. Proliferative glomerulonephritis.
E. Pyelonephritis.

ANS: C

6. **A 25- year-old woman complains of sudden onset of acute abdominal pain. Physical examination shows abdominal distention. A CT scan reveals a solitary 20cm mass of the liver. A surgical resected portion of the liver is shown in the image. This patient's tumor was most likely associated with chronic exposure to which of the following?**



A. Carbon tetrachloride.
B. Halothane.
C. L-thyroxine.
D. Oral contraceptive.
E. Vinyl chloride.

ANS: D

7. **A 45-year old mildly obese woman presents with a 1-week history of upper abdominal pain, fever and occasional vomiting. Physical examination shows severe right upper quadrant tenderness, laboratory studies include serum bilirubin of 1 mg/dl. AST of 25 U/L ALT of 35 U/L alkaline phosphatase of 220 U/L (high), WBC of 14,000µl and amylase of 35 U/L (normal). An ultrasound examination reveals a normal appearing liver and bile duct and thickening of the wall of gallbladder. Which of the following is most likely the diagnosis?**

A. Acute cholecystitis.
B. Acute pancreatitis.
C. Adenocarcinoma of the gallbladder.
D. Adenocarcinoma of pancreas.

ANS: A

8. A 47-year-old woman presents with a 3-month history of vague upper abdominal pain after fatty meals, some abdominal distension, and frequent indigestion, Physical examination shows an obese woman with right upper quadrant tenderness, An ultrasound examination discloses multiple echogenic objects in the gallbladder. Which of the following metabolic changes is most likely associated with the formation of gallstones in the patient?

A. Decreased hepatic bilirubin conjugation.
B. Decreased serum albumin.
C. Increased bilirubin uptake by the liver.
D. Increase hepatic cholesterol secretion.

ANS: D

9. For the patient described in previous question, Which of the following is a common complication?

A. Bile peritonitis.
B. Chronic passive congestion of the liver.
C. Primary hepatocellular carcinoma.
D. Extrahepatic biliary obstruction.

ANS: B

10. Which of the following is the most likely underlying cause of gynecomastia in cirrhotic patient?

A. Hyperbilirubinemia.
B. Hyperestrogenism.
C. Hypoalbuminemia.
D. Ketoacidosis.

ANS: B

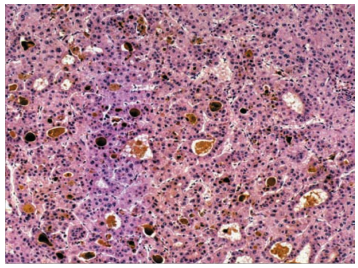
11. Pancreatic carcinoma most likely arose from which of the following types of cells?

A. Acinar cells.
B. Alpha cells.
C. Beta cells.
D. Ductal cells.

ANS: D

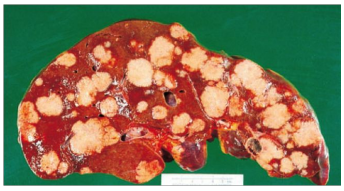
12. A 68-year-old man complains of vague abdominal pain, and weight loss over the past 6 months. For the past 12 years, he has suffered from chronic hepatitis B. On physical examination, the patient shows hepatomegaly, and mild jaundice. A CT scan of the abdomen reveals a diffusely nodular liver, with a dominant mass measuring 3 cm in diameter. A needle biopsy is shown in the image. Which of the following serum markers is useful for monitoring the progression of disease in this patient?

A. Alkaline phosphatase.
B. Alpha-fetoprotein.
C. Anti-HBc antibody.
D. Carcinoembryonic antigen.
E. Human chorionic gonadotropin.



ANS: B

13. **A 69-year old woman arrives in the emergency room complaining of weakness, abdominal pain, and 9 kg weight loss during the past month. Physical examination reveals jaundice, conspicuous hepatomegaly and ascites. The patient expires and a section of liver is examined at autopsy (shown in the image). Which of the following is most likely diagnosis?**



A. Hemangiosarcoma of the liver.
B. Metastatic carcinoma of the liver.
C. Miliary tuberculosis.
D. Primary hepatocellular carcinoma.

ANS: B

14. **A 52 year old his past medical history includes malaria and infection with the liver fluke Clonorchis sinensis. An abdominal CT scan shows mass in the liver, Biopsy disclosis well-differentiated neoplastic glands embedded in a dense fibrous stroma. Which of the following is the most likely diagnosis?**

A. Carcinoma of the gallbladder.
B. Cholangiocarcinoma.
C. Hemangiosarcoma.
D. Hepatocellular carcinoma.

ANS: B

For any suggestions or questions please don't hesitate to contact us on: Pathology434@gmail.com
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