Pathology

Chronic cholecystitis

Morphology

Gross : Size: contracted, enlarged or normal , with thick wall, almost always associated with presence of stones

Histopathology

☒ Variable
- Mild → scattered lymphocytes, plasma cells and macrophages in mucosa and subserosa
- Advanced → marked subepithelial and subserosal fibrosis, muscle hypertrophy and mononuclear cell infiltration

☒ Outpouchings of the mucosal epithelium through the wall (**Rokitansky-Aschoff sinuses**)

Diseases of biliary tree

1.Choledocholithiasis: Refers to the presence of stones within the bile ducts of the biliary tree.

2.Cholangitis: Is acute inflammation of the wall of bile ducts, almost always caused by bacterial infection of normally sterile lumen. It can result from any lesion obstructing bile flow, the most common cause is Choledocholithiasis and also surgery of biliary tree.

Gall bladder carcinoma:

- ✓ Is the **most common malignancy of extrahepatic** biliary tract
- ✓ **Risk factors** : 1.**Gallstones** are present in 95% of cases ,and chronic bacterial and parasitic diseases of the biliary tree (Presumably, gallbladders containing stones or infectious agents develop cancer as a result of chronic inflammation), 2.**Primary sclerosing cholangitis**
- ✓ **Gross features**: infiltrating (more common) and exophytic.
- ✓ **Microscopical features**: Most gall bladder carcinomas are **adenocarcinomas**

Cholangiocarcinomas

- ✓ Are **adenocarcinomas** that arise from cholangiocytes lining the intrahepatic and extrahepatic biliary ducts.
- ✓ Intrahepatic cholangiocarcinoma is the second most common primary malignant tumor of the liver after hepatocellular carcinoma

- ✓ **Risk factors** : primary sclerosing cholangitis, fibropolycystic disease of the liver and biliary tree and some infestations. Intrahepatic cholangiocarcinomas also are elevated in patients with hepatitis B and C and NAFLD. These risk factors cause chronic injury, inflammation and cholestasis that probably promote mutations.
- ✓ The extrahepatic CCA usually small at time of Dx
- ✓ Histopathology : **Adenocarcinoma**

Diseases of the pancreas

Congenital anomalies e.g. agenesis, annular pancreas, ectopic pancreas, congenital cysts and pancreas divisum

Pancreas divisum: Is the **most common congenital anomaly** of the pancreas. It is due to failure of fusion of the fetal duct systems, so the bulk of the pancreas drains into the duodenum through the small-caliber minor papilla, while the main pancreatic duct drains only a small portion of the head of the gland through the papilla of Vater (thus, inadequate drainage of the pancreatic secretions through the minor papilla), elevating intraductal pressure throughout most of pancreas therefore, increasing the risk of **acute** or **chronic pancreatitis**

Pancreatitis: Inflammation of the pancreas

- ❖ Types: acute and chronic pancreatitis

1. Acute pancreatitis : is reversible inflammatory disorder that varies in severity (focal edema and fat necrosis – wide spread hemorrhagic parenchymal necrosis)

.Etiological factors of acute pancreatitis (10% - 20% is idiopathic) while 80% is due to **impaction of gall stones within the common bile duct** and **alcoholism**:

Causes	
Metabolic	e.g. **alcoholism** , hypertriglyceridemia, hypercalcemia (e.g. hypercalcemia due to hyperparathyroidism) and drugs (e.g., thiazide diuretic, anti-convulsants)**.**
Genetic	1. Inherited mutations in genes encoding pancreatic enzymes or their inhibitors e.g. hereditary pancreatitis due to mutations in the trypsinogen gene (autosomal dominant) and 2. Cystic fibrosis
Mechanical	e.g. 1.obstruction of pancreatic duct :e.g**. Gallstones** , tumors and pancreas divisum or parasites 2. Trauma
Infections	e.g. Mumps
Vascular (ischemia)	e.g. shock ,thrombosis or embolism

Pathogenesis of acute pancreatitis

Acute pancreatitis appears to be caused by **autodigestion** of the pancreatic substance by inappropriate intraacinar activation of pancreatic enzymes:

- Activation of **trypsin** is the critical triggering event , trypsin when activated, will activate other proenzymes e.g. prophospholipase and proelastase
- It also activates the kinin , clotting and complement systems
- The end result is autodigestion of the pancreas
- **Three pathways can initiate the initial enzyme activation** (alcohol can cause all three pathways)

❖ Pancreatic duct obstruction
❖ Primary acinar cell injury
❖ Defective intracellular transport of proenzymes within acinar cells

} All pathways will cause acinar cell injury

Acinar cell injury will lead to the release of activated enzymes , causing interstitial inflammation and edema, proteolysis (proteases) ,fat necrosis (lipase, phospholipase) and hemorrhage (elastase) leading to autodigestion

Morphology of acute pancreatitis

Gross: **Mild** (acute interstitial pancreatitis: swollen and edematous pancreas) or **severe** (acute hemorrhagic pancreatitis: hemorrhagic / necrotic mass).
.Yellow nodules represent fat necrosis in pancreas, mesenteric and peritoneal fat.

Microscopical features:

Mild form (interstitial edema and inflammatory cells with focal fat necrosis in the pancreas and peri-pancreatic tissue).
. Dystrophic calcification seen with fat necrosis
Severe form : Extensive parenchymal necrosis and hemorrhage

Thank you