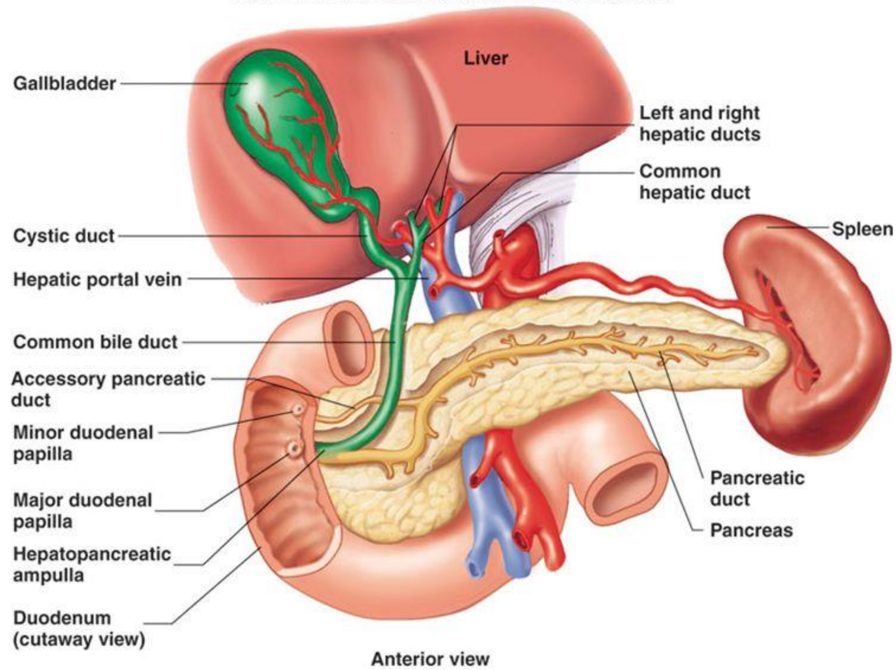
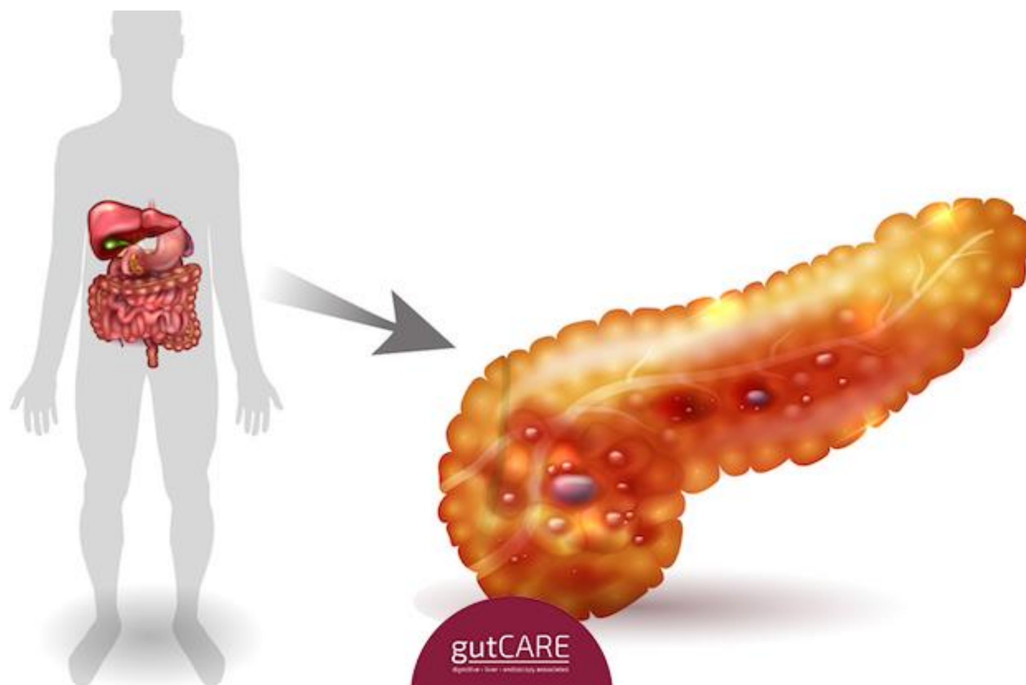
Acute Pancreatitis

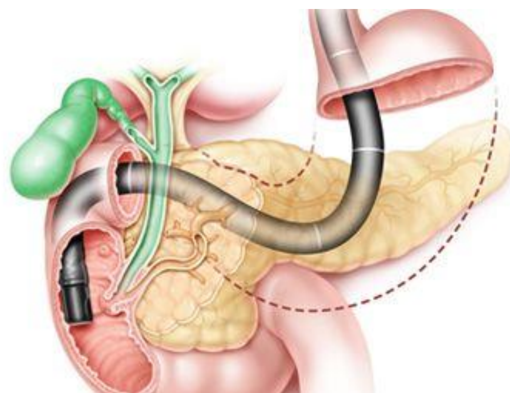
* **Incidence :** Rare in Egypt .





*** Aetiology: (get 3I)**

1. **Migrating GB stones:** (50% biliary pancreatitis)
   a) **Reflux of infected bile** into the pancreatic ducts as a result of obstruction of ampula of Vater by migrating stone, stenosis or spasm of sphincter of Oddi.
   b) A stone may **obstruct** the pancreatic ducts.
   c) **Passage of a stone** through the ampulla may initiate the attack.
2. ***Excess alcohol intake*** (35%).
3. ***Trauma*:** e.g. ERCP is the third common cause , operation or accident.
4. ***Infection*** e.g. mumps or influenza.
5. ***Vascular insufficiency*** → infarction of pancreas → release of enzymes.
5. **Idiopathic with no detectable cause .**
6. **Rarely ,** autoimmune , hyperparathyroidism & corticosteroid .



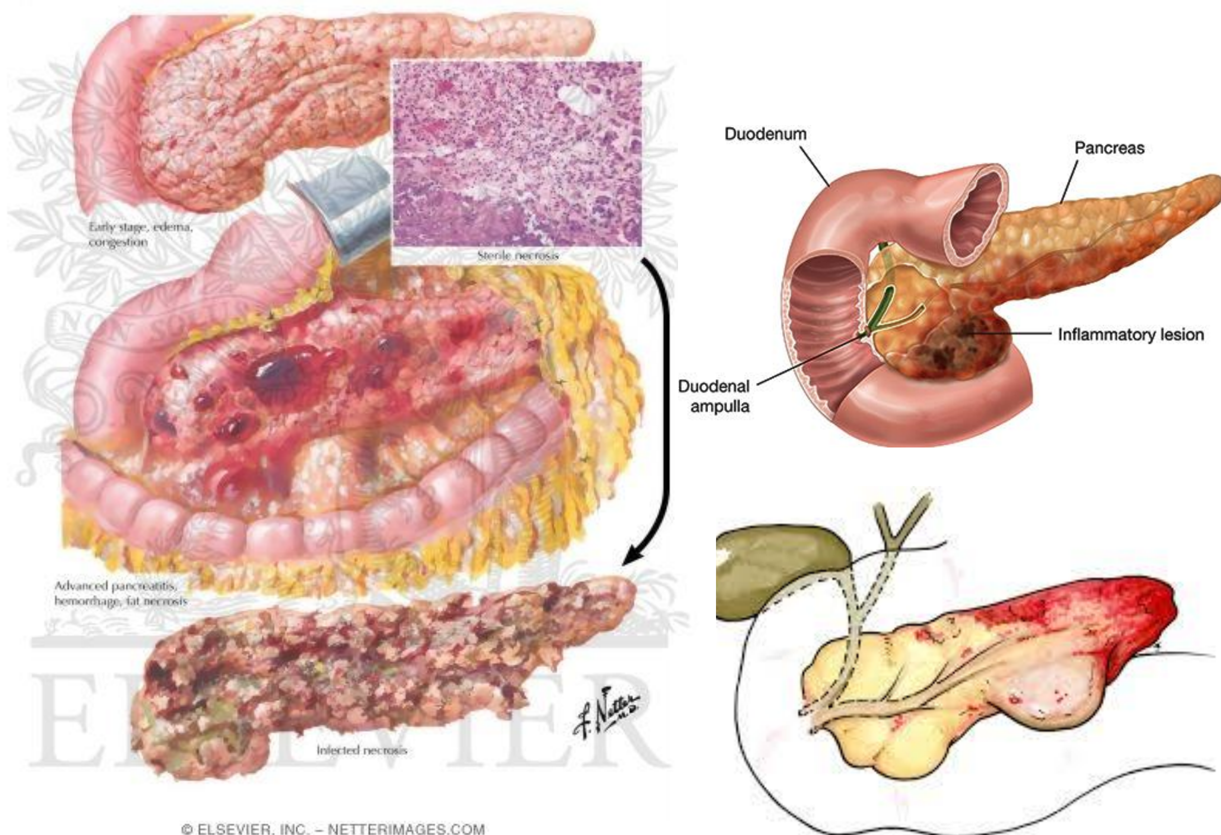
Acute Pancreatitis

*** Pathology:**

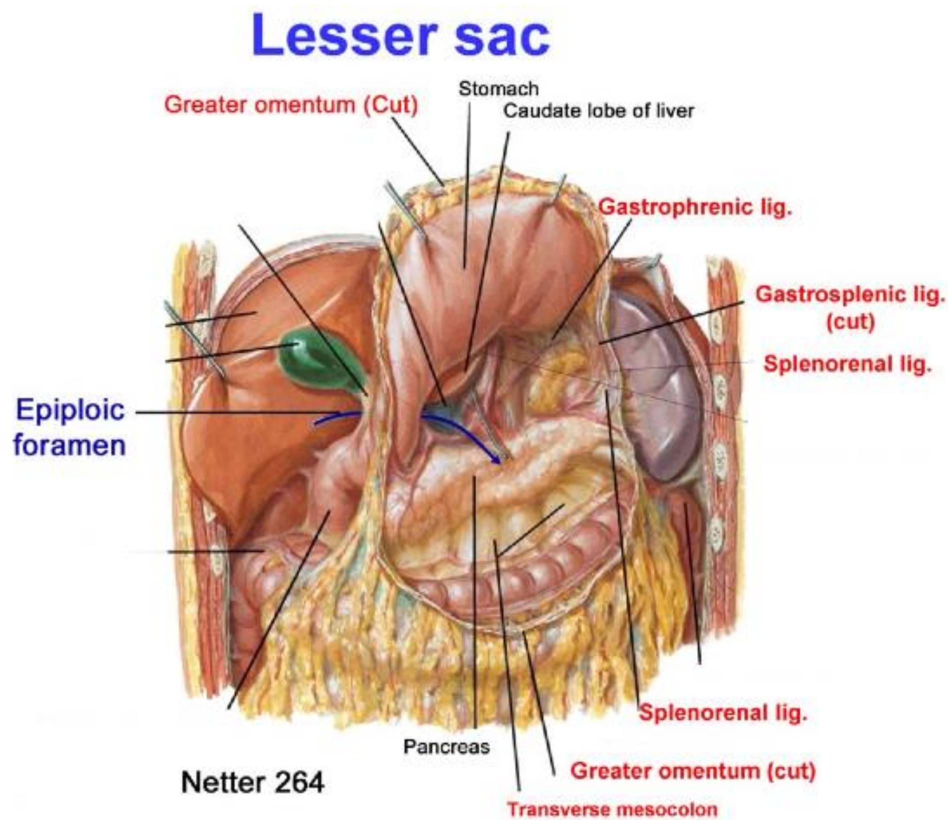
1) Any factor leading to obstruction of pancreatic duct obstruction or defective intracellular perfusion → acinar cell injury leading to the following .
2) **Premature activation of pancreatic enzymes** inside the pancreas leading to :
   - Auto-digestion & inflammation of pancreas.
   - Formation of inflammatory mediators and cytokines → systemic inflammatory response syndrome (SIRS)
   - Erosion of neighboring blood vessels by elastase enzyme.
3) Release of lipase enzyme from pancreas → fat necrosis in the surrounding tissues with release of the followings:
   - **Fatty acids** which combine with calcium of tissue fluid → hypocalcaemia and appearance of white patches of ***fat necrosis*** in the mesentery and omenta .
   - ***Glycerol*** → excreted in urine.
4) **Proteolytic activity** of liberated pancreatic enzymes (protease) → release of protein breakdown products , kinins & other mediators → wide spread vasodilatation → severe hypotension and haemodynamic changes → severe shock & multiple organ failure
5) **According to the severity**, pancreatitis may be one of the followings :
   a. **Catarrhal** pancreatitis: the pancreas is congested , swollen & edematous without hemorrhage or necrosis .
   b. **Haemorrhagic** pancreatitis : haemorrhage in the pancres and peritoneum and retroperitoneal space.
   c. **Necrotizing** pancreatitis : severe necrosis in pancreas.

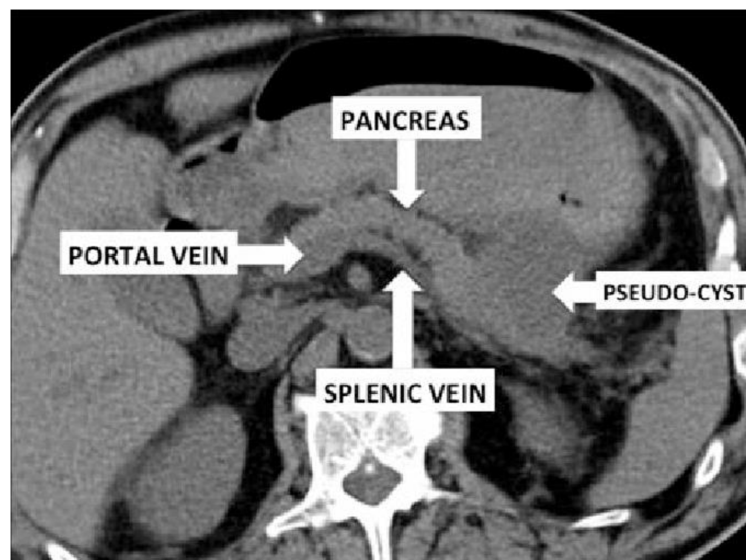
⁎ **N.B:**

- **Catarrhal** pancreatitis gives **mild** clinical manifestations .
- **Hemorrhagic & necrotizing** pancreatitis gives **severe** clinical manifestations



6) A blood stained & protein rich ***exudates*** accumulates in one of the followings :
   - The generalized peritoneal cavity → generalized peritonitis
   - The exudates may be localized beside the pancreas → ***subphrenic abscess*** or ***pseudo-pancreatic*** cyst (collection of pancreatic secretions and inflammatory exudates within a lining of inflammatory tissue in the lesser sac between stomach & pancreas).





* Complications:

I. General complications:

1. ***Hypovolaemic shock:*** due to loss of plasma and blood into the peritoneum and retroperitoneal spaces.

2. ***Multiple organ failure:*** Adult respiratory distress syndrome & hepato-renal failure due to prolonged hypovolaemic shock.
3. ***Consumption coagulopathy.***
4. ***Tetany*** due to hypocalcaemia.

5.Acute gastrointestinal **stress ulcers and hemorrhage** .

II. Local complication:

1. ***Peritonitis*** & paralytic ileus.
2. ***Pancreatic pseudocyst***
3. Pancreatic **abscess**.

* **Clinical Picture:** You should answer the following questions

I) Is this case is acute pancreatitis :

1) Fever , headach , anorexia & malaise (FAHM) & tachycardia .
2) ***History of the cause*** followed by acute onset of the followings:

3) Epigastric or upper abdominal pain :

- It is the main , commonest and early symptom in all cases .
- It is radiating to the back, improved by sitting or leaning forwards and aggravated by lying down .

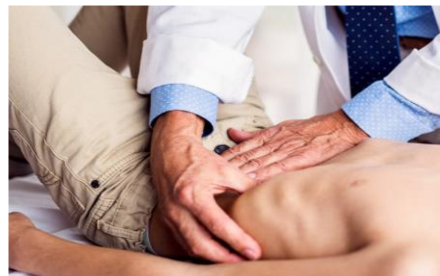
4) Mild epigastric ***tenderness , rebound tendernss , rigidity*** & limitation of movenents of abdominal wall with **respiration** (pancreas is retroperitoneal structure away from sensitive parietal peritoneum)which become severe and generalized when peritonitis occur.

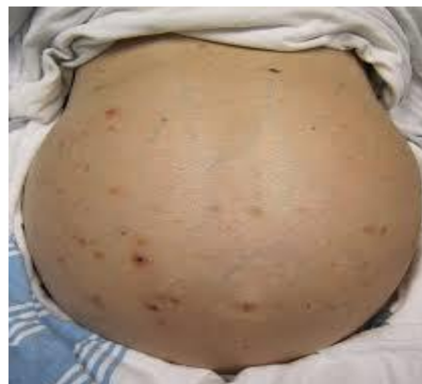
4) Anorexia , ***nausea & vomiting.***

5) Collapse and manifestation ***of shock*** (mention in short).

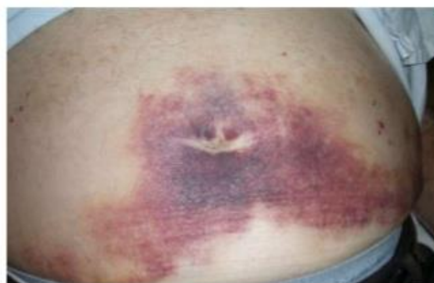
6) Manifestations of ***peritonitis & paralytic ileus*** with shifting dullness and reduced intestinal sounds in late cases.

7) Rarely & late after few days , retroperitoneal haematoma → bluish discolouration in the flanks (***Grey Turner's sign***),around the umbilicus (***Cullen's sign***) or distal to inguinal ligament (**Fox sign**).
8) 2-3 weeks after the acute attack palpable mass in the epigastrium (***Pancreatic pseudocyst***).

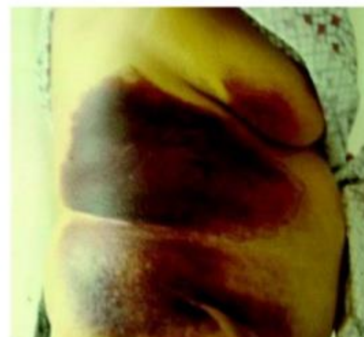


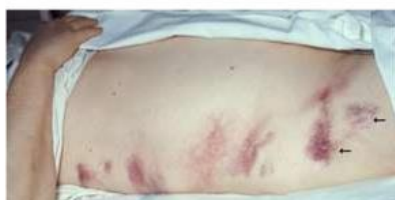


Cullen's Sign



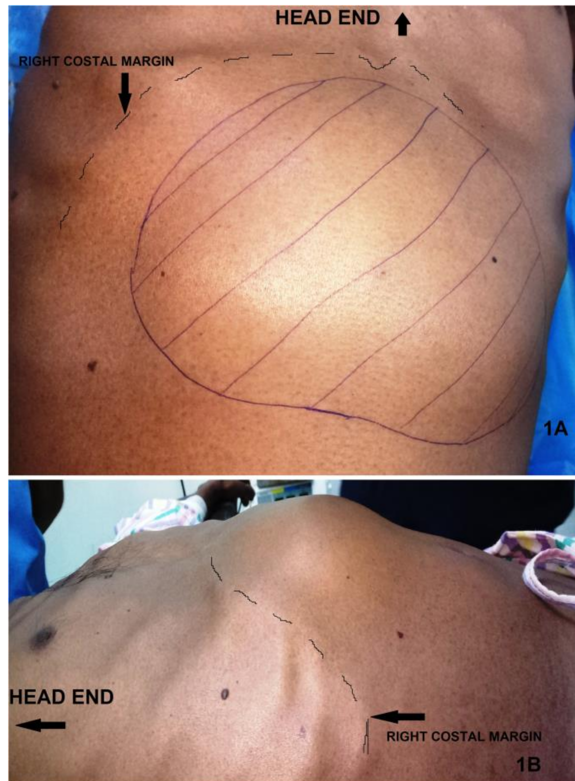
Grey Turner's Sign





Fox's Sign

Pancreatic pseudocyst



> ⁎ **N.B : In acute pancreatitis there are severe symptoms and systemic manifestations with mild local signs .**

II) **What is the severity of acute pancreatitis ?**

- **Ranson's criteria & scoring** system assess the severity and prognosis of acute pancreatitis .
- Give every of the following criteria **one point** .

On admission (Remember **LEGAL**)	**48 hours after admission (ABCD)**
Leucocytes: Above 16000/uL	**A**rterial PO_2 : Less than 60mmHg
Enzyme AST : Above 250 IU/L	**B**lood urea nitrogen(BUN): Above 5 mg/dL
Blood **g**lucose :Above 200mg/dL	**B**ase deficit : Above 4 Eq/L
Age : Above 55 years	Serum **C**alcium :Less than 8mg/L
LDH enzyme: Above 350 IU/L	Hemato**C**rit decrease : more than 10%
	Fluid sequestration more than 6L

- Score 2 or less : Mortality is less than 1% .
- Score 3-4 : Mortality is 15%

- Score 5-6 : Mortality is 40%
- Score 7 or more : Mortality is 100%
- Score 3 or more, acute pancreatitis is severe.

* **D.D.:** Other causes of **acute upper abdominal pain** especially perforated P.U, acute gastritis or acute gastric ulcer , acute cholecystitis, acute I.O, renal pain , leaking aortic aneurysm , acute mesenteric vascular occlusion , basal pneumonia & myocardial infarction.

* **Investigations:**

I) Investigation for pancreatitis :

A) Laboratory:

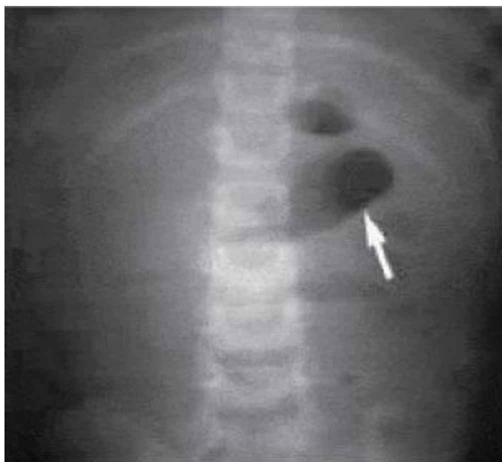
1. **Serum & urinary amylase** are elevated:
   - **Normal** serum amylase is 100-300 IU/dL
   - It is increased in **acute pancreatitis** above 1000 IU/dL.
   - It is elevated only for 2-3 day after the onset.
   - It is **not specific** as it is increased in other pathological conditions as perforated peptic ulcer but elevation in these conditions does not increase above 500 IU/dL.
2. **Serum lipase**: Increased and **more specific** than amylase.
   - The level of amylase or lipase is **not related to severity** of pancreatitis .
3. **Serum Ca**.: Reduced
4. **Leucocytosis**.
5. **Haematocrite** is **early** elevated due to fluid loss but is lower in **haemorrhagic** pancreatitis .
6. Hyperglycemia due to lack of insulin
7. **Arterial blood gases** to detect the need for mechanical ventilation.

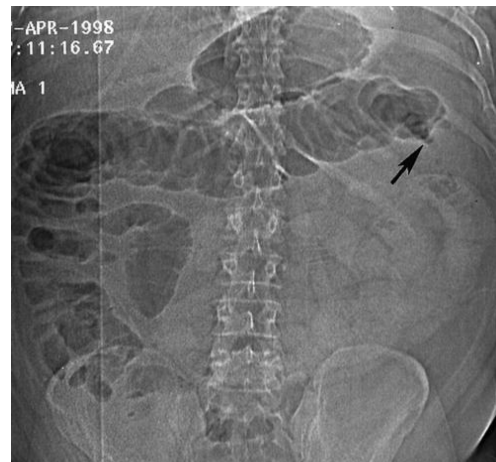
8. Cardiac enzyme **creatine phosokinase & ECG** to exclude myocardial infarction .

B) Radiological:

1. ***Plain X-ray*** of the abdomen may show:
   a) Dilated short segment of the small intestine ***(sentinel loop).***
   b) Distension of the transverse colon and collapse of the descending colon ***(colon cut – off sign)***.

Sentinel loop ***colon cut – off***

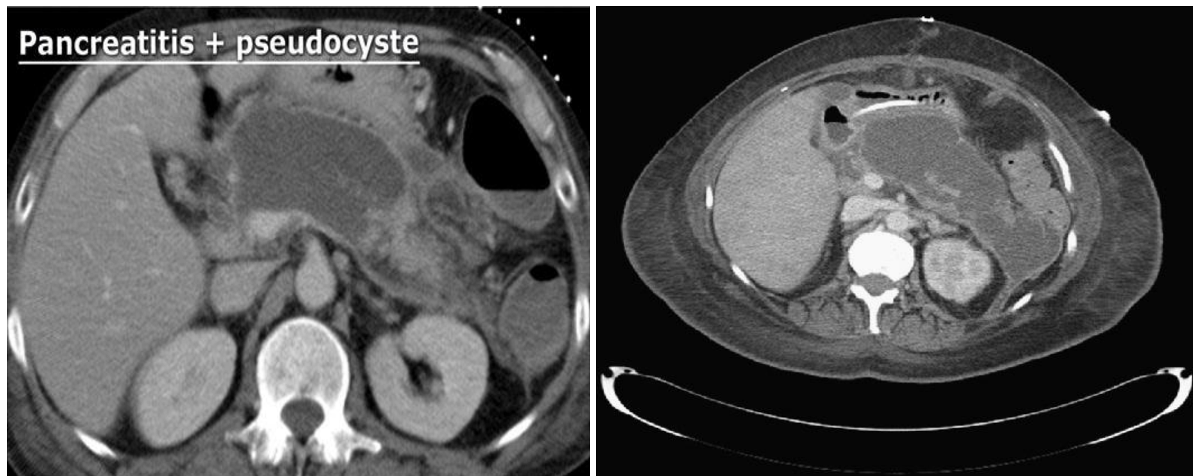




2. ***Abdominal U/S :*** show G.B stones and dilatation of biliary passage above CBD stone .
3. ***CT scan with IV contrast*** (**main investigation** in any pancreatic disease)may show gall stones, intra-peritoneal fluid and enlargement of the pancreas ,peri-pancreatic edema, areas of pancreatic necrosis (part of parynchema is not enhanced after contrast) & later on pancreatic pseudocyst.
4. Magnetic resonance cholangiopancreatography (**MRCP**) to detect any pathology in the biliary passage .
5. **Diagnostic ERCP after** subside of the attack of biliary pancreatitis

C) Abdominal paracentesis shows pancreatic ascites.

Massive pancreatic necrosis



II) Investigations to **exclude** other causes of upper abdominal pain .

* Diagnosis of acute pancreatitis by the presense of **2 feature** of the following :
  1) Severe persistent **pancreatic pain** .
  2) Raised serum **amylase or lipase** .
  3) Chanacteristic features of pancreatitis on **CT or MRI** .

* **Treatment:**

I) Conservative: (***main treatment***).

- Severe cases are admitted to **ICU**
- **Aim:** Support the different body systems.
- **Method: (7R)**.
  - ***Relief of pain:*** by pethidine (Morphine is avoided) with atropine derivative (to prevent spasm of sphincter of Oddi).
  - ***Replacement of the lost fluids*** by Ringer's lactate, plasma & blood may be needed with addition of **calcium** to the infusion. Replacement is **monitored** by vital signs, urine output, CVP & haematocrit.

- ***Rest of the pancreas and bowel:*** nothing is taken orally & nasogastric suction & somatostatin.
- ***Respiratory support*** by oxygen mask, or endotracheal tube and mechanical ventilation if there is respiratory failure.
- ***Resistance of infection*** by prophylactic antibiotics is controversial but it is important in hemorrhagic & necrotizing pancreatitis to avoid infection e.g. imipenem .
- ***Reassessment*** of the patient by vital signs , urine output , blood gases ,blood PH , hematocrite . fluid intake & relieve of symptoms .
- **Removal** of bile duct stone and sphincterotomy are recommend after subside of the attack of biliary pancreatitis by **ERCP** except if there is obstructive jaundice or cholangitis , this can be one during the attach .

II) Surgical:

- **Indicated** in uncertain diagnosis or local complications.
- **Method:**

a)Recently, acute abdomen is explored through laparoscope:

- ***If acute pancreatitis*** is detected, the patient is spared the trouble of laparotomy.
- ***If other cause*** of acute abdomen is detected, it is treated either by laproscopic or open surgery.

b) If **necrotizing pancreatitis** is detected by CT scan **,open exploration,** remove necrotic tissues, peritoneal lavage & close the abdomen with drainage (can allow postoperative lavage).

- **If a stone is discovered** in the CBD, it is advised to ***drain the duct*** by T-tube & do ***not remove*** the stone in the same session.

c) After complete cure of the attack of biliary pancreatitis , **cholecystectomy** should be done before discharging the patient from the hospital .

d)**External dainage of a pancreatic abscess** by a tube.

e) Internal drainage of pseudocyst (if persistent more than 6 weeks), into stomach or to jejunal loop.