- **Sex: 男　Age: 59**
- **Occupation: postman**

- **Chief Complaint**
- LUQ tenderness for almost 2 months

Present Illness(1)

- This 60-year-old man suffered from diabetes mellitus noted for over 3 years ago. However, he never received any management except for diet control. According to his own and his sister's statement, he was quite well until almost 2 months ago after his family party. He drank too much alcohol drink without eating enough food at that time. Since then, he started to suffer from LUQ and epigastric tenderness. Its character was dullness, no radiation, no significant association between its severity and feeding or body position, sometimes it was subtle, but most painful in the mid-night. The abdominal pain was accompanied with gradual abdominal fullness, poor appetite, fatigue, and weakness .

Present Illness(2)

- So he went to United Clinical Laboratory (聯合醫事檢驗所) on 2002-10-10 to receive blood test, and abnormal biochemical data included hyperglycemia (AC sugar 236, PC sugar 376), elevated r-GT (data 144, normal range 11-43), and elevated direct bilirubin (bil.D/T data 0.48 / 0.70, normal range 0.1-0.4 / 0.2 – 1.2). However, other hepatobiliary related data including GOT/GPT, albumin, and alkaline-p were normal

Unfortunately, the jaundice symptoms including icteric sclera, general yellowish skin color change, and tea-colored urine were complained since about 1 week ago. However, the stool color was light-yellow, but not in clay color. He went to visit other two clinical laboratories for liver function test.

The abnormal data included: AC sugar 270 and elevated r-GT (data 1616, normal range 5-49) from Chung-Shing Pharmacy(中興藥局) on 2002-10-25; PC sugar 458, GOT/GPT 390/810, bilirubin D/T 2.5/8.0, alkaline-p 933, r-GT 1605, and negative hepatitis B and C marker from Charng-Geng Ann Clinical Laboratory (長庚安醫學檢驗中心) on 2002-10-28.

Family History

- a younger sister: non-B-non-C hepatits(+)

Personal History

- smoking(+): 5 piece/day since youth, but quit for many years
- drinking(+): social drinking almost every week, but limited volume,diluted Whisky, for 10 years
- deny any known food or drug allergy
- **Past History**
- except for the above illness,
- deny other systemic illness (ie. hypertension, heart disease, hepatitis),
- deny other surgical operation history

Physical Examination

GENERAL APPEARANCE:

conscious: E4M6V5, JOMAC: intact,

ill-looking, mood: stable, insight: intact

VITAL SIGNS:

at ward: TPR: 36.5 / 78 / 18; BP: 160 /100 mmHg

SKIN: general yellowish skin(+), no dehydration, no rash, no vesicle

HEENT:

head: no trauma, no deformity

eyes: no pale conjunctiva, icteric sclera(+), no xanthoma,

no visual ability and field defect,

no pupil size and light reflex defect

ears: no deformity, no hearing loss

- ENT: no jugular vein enlargement, no lymphdenopathy, no tracheal deviation, no thyroid enlargement
- CHEST:cardiac: regular heart beat, no murmur, no S3/S4,pulmonary: symmetric expansion, clear breathing sound,lung-liver border: at 5^{th} inter-costal space
- ABDOMEN:

  normo-active bowel sound, no bruit, no friction rubs,soft and flat, no muscle guarding, percussion: dullness,no tenderness, no rebounding pain,no knocking pain, Murphy's sign: negative,no palpable mass or spleen, liver span: 10cm at RCML,no shifting dullness, no protruding umbilicus,no superficial vein engorgement, no fluid wave

- GENITO-URINARY:
- no dysuria with burning sensation, no frequency,
- no nocturia, no incontinence
- BACK & SPINE:
- no costo-vertebral angle knocking pain,
- no kyphosis, no scoliosis
- EXTREMITIES:
- freely movable, no pitting edema, no clubbing finger, no white nail

- **Laboratory Data**
- 血液
- 項目\日期時間 91/10/29 10:57
- WBC [5.2-12.4 x10.e3/uL] 5.89
- RBC [4.2-6.1 x10.e6/uL] 5.01
- HGB [12-18 g/dL] 15.0
- HCT [37-52 %] 43.8
- MCV [80-99 fL] 87.4
- MCH [27-31 pg] 29.9
- RDW [11.5-14.5 %] 13.3
- PLT [130-400 x10.e3/uL] 267
- %NEUT [40-74 %] 59.8
- %LYM [19-48 %] 25.5

- 急診生化
- 項目\日期時間 91/10/29 11:24
- Glucose(血)[60-110 mg/dl] 274
- BUN(血) [7-18 mg/dl] 15
- GOT(血) [0-40 IU/L] 287
- GPT(血) [0-40 IU/L] 532
- Bilirubin D(血)[0.0-0.2 mg/dl 6.2
- Bilirubin T(血) 9.4
- Na(血) 135.0
- K(血) 3.60

- 血液
- 項目\日期時間　91/10/29 11:37
- PT_FIB　11.47
- APTT_T [20-36 sec]　24.65
- Bleeding time(血)　2‘30“
- 血清免疫
- 項目\日期時間　91/10/30 09:25　91/11/01 09:14
- AFP(血) [<12 ng/ml]　1.87
- CEA(血) [<4.6 ng/ml]　5.75
- CA199(血) [<37 U/ml]　**1387.00**
- HBsAg, anti-HBc IgM, anti-HCV Ab, anti-HAV IgM: all are negative
- -

- **Clinical course**
- 1 admission on 91-10-29
- 2 initial management:
- bed rest
- on diabetes mellitus diet
- Silymarin 1# tid
- 3 further evaluation:
- check hepatitis marker and alfa-FP
- arrange abdominal echo on 91-10-30
- 4 according to abdominal echo finding
- → check tumor marker and arrange ERCP on 91-11-1
- → arrange MRCP on 91-11-2
- 5 for significantly progressive jaundice, arrange PTCD on 91-11-4

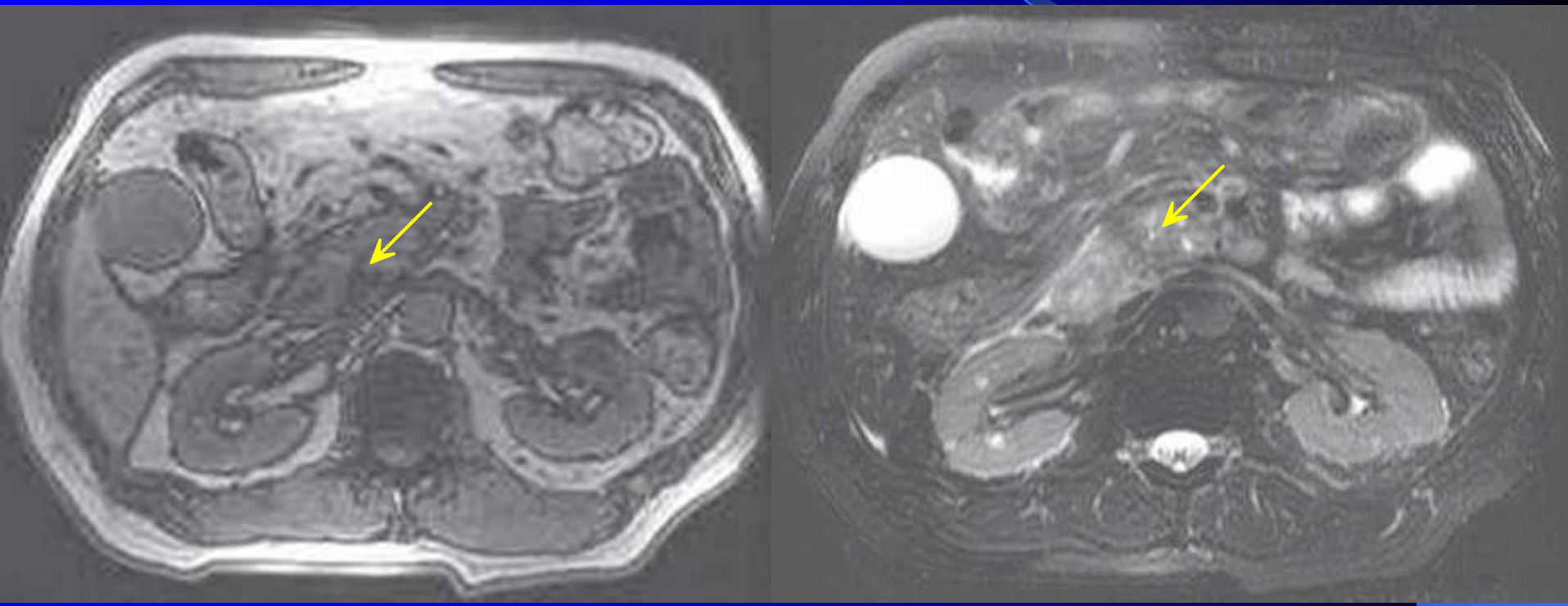
abdominal echo on 2002-10-30

- Liver: Heterogenous echogenicity of parenchyma
- No space-occupying lesion
- Biliary system:
- 1. Gall bladder: Some echogenic shadow layer in GB
- 2. IHD: Dilated, diameter: R't 4mm, L't 3mm

arrange MRCP on 2002-11-2

- 1. There is an ill-defined mass (measuring approximately 1.4 cm x 2.0 cm in dimension) situated in the uncinate process of pancreatic head.
- 2. The pancreatic head mass exhibits iso-signal intensity on T1WI and T2WI with less enhancement than normal pancreas on post-enhanced study.
- 3. The pancreatic head mass results in markedly dilatation of entire pancreatic duct, entire common bile duct with abrupt termination at its distal-most portion, as well as dilatation of common hepatic duct, bilateral intra-hepatic biliary trees and gall-bladder.

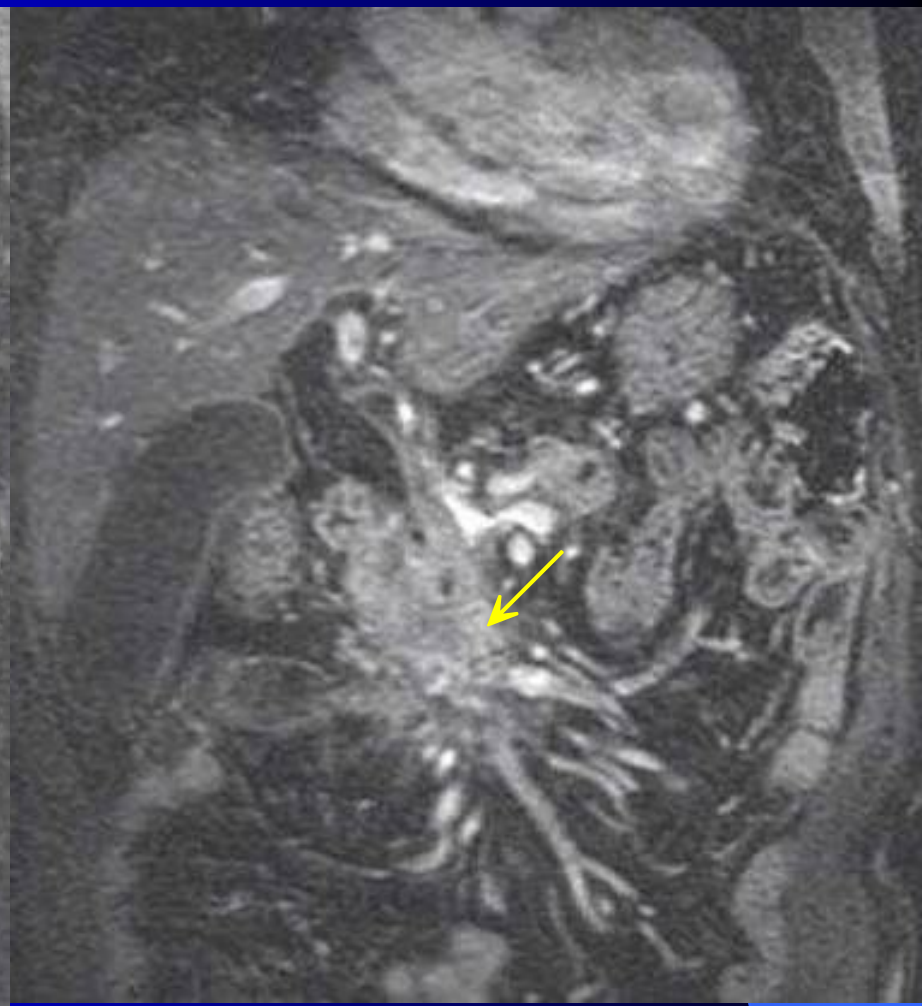
T1W1 andT2W2



post-contrast

Pre-contrast

post-contrast



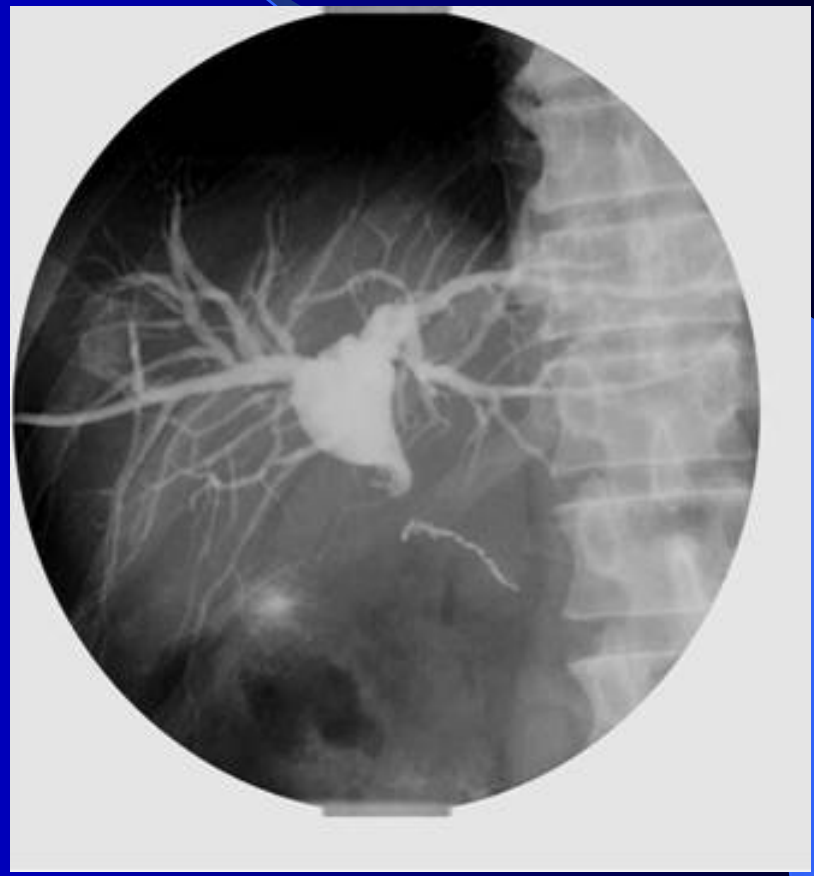
MRCP on 2002-11-2

- 3. mild blurring of peri-pancreatic fatty planes surrounding the pancreatic head is also noted.
- 4. relatively intact the SMA, SMV and celiac

- IMP: Pancreatic carcinoma in uncinate process resulting in markedly dilatation of entire pancreatic duct, entire common bile duct and biliary trees is considered.

PTCD on 2002-11-4

- This is a patient of chronic pancreatitis with biliary obstruction, status post PTCD insertion and bypass surgery.
- Mild stricture noted at the distal CBD near anastomosis site.
- Mild dilatation of the CBD. No other significant abnormal findings.
- IMP: Mild stricture at the distal CBD near anastomosis site, with mild dilated proximal CBD noted.



Operation

- Operation day on 2002-11-19
- Operation: cholecystectomy, choledechojejunostomy with Roux-en-Y and gastrojejunostomy(retrocolic, post wall)
- Finding: A large mass of 5-6 cm in diameter atpancreatic head with tight adhesion to portal vein and common hepatic artery ,stony hard
- Lymph nodes along SMA up to 1.5 cm , hard in consistency

Different diagnosis

- Acute pancreatitis
- Chronic pancraestitis
- Pancreatic cancer

Acute pancreatitis

- **Etiology:**
- Gallstones, alcohol, idiopathic,& miscellaneous
- Gallstones -- Acute or acute relapsing pancreatitis
- Alcohol & other causes -- acute or chronic forms
- Acute attack may be precipitated by reflux of bile into pancreatic duct from the duodenum.

- **Clinical Features:**

1. Abdominal pain
2. Sudden onset of severe pain over the: epigastrium, RUQ or LUQ, or generalized.
3. The pain is persistent, lasting for days,and tend to radiate to the back.
4. Vomiting -- May occasionally aggravate the pain
5. Tachycardia & pyrexia
6. Jaundice
7. Glycosuria
8. Vague abdominal mass
9. Abdominal distension, tenderness, or rigidity
10. Reduced bowel sound

- **Fulminating pancreatitis**
- Tachycardia & low B.P.(may be the only sign)
- Acute diabetic ketosis or oliguria.
- Hemorrhagic pancreatitis may appear after a few days
- **Severe pancreatitis**
- May also presented as an acute abdomen with ileus
- Shock (-)
- Prognosis is less serious
- **Mild pancreatitis**
- Less severe abd. pain
- Epigastric tenderness or guarding is usually presented
- Shock or ileus (-)

- **Factors adversely affecting survival in acute pancreatitis: Ranson's criteria**
- **A. At admission or diagnosis** 1. Age >55 years . 2. Leukocytosis >16,000 /cumm .3. Hyperglycemia >200 mg/dL 4.Serum LDH >400 IU/L5 Serum AST >250 IU/L5
- **B. During initial 48 hrs** 1. Hematocrit fall >10 percent 2. Fluid sequestration >4000 mL 3. Hypocalcemia <8.0 mg/dL4 .Hypoxemia (PO2 <60 mmHg)5.. BUN rise >5 mg/dL after IV fluids Hypoalbuminemia <3.2 g/dL

- **Contrast-enhanced CT scoring system**
- **GradeCriteria**
- A:Normal
- B:Focal or diffuse glandular enlargement
- Small intra-pancreatic fluid collection
- C:Any of the above
- Peripancreatic inflammatory changes
- Less than 25% gland necrosis
- D:Any of the above
- Single extrapancreatic fluid collection
- 25-50% gland necrosis
- E:Any of the above ,Extensive extrapancreatic fluid collection
- Pancreatic abscess
- More than 50% gland necrosis

Chronic pancreatitis

- Chronic inflammatory disease of the pancreas
- Results in irreversible destruction of both the endocrine and exocrine pancreatic tissue
- Early stages of the disease may be characterised by episodes of acute pancreatitis
- Pancreas may appear macroscopically normal
- Late stage of disease is characterised by pancreatic fibrosis and calcification
- Pancreatic duct dilatation and stricture formation occurs
- Cysts form within the pancreatic tissue

Chronic pancreatitis

- Aetiological factors include
- Alcohol
- Tobacco
- Pancreatic duct strictures
- Pancreatic trauma
- Hereditary pancreatitis
- Tropical pancreatitis
- Male to female ratio is approximately 4:1
- Mean age of onset is approximately 40 years
- The incidence is increasing
- Chronic pancreatitis increases the risk of pancreatic carcinoma

Clinical features

- Pain is the principal symptom in most patients
- Usually epigastric, sub-costal and radiating to the back
- Pain may be continuous or episodic
- Often interferes with life and may lead to opiate abuse
- Weight lost may occur
- Loss of exocrine function produces malabsorption and steatorrhoea
- Loss of endocrine function results in diabetes

Investigation

- Serum amylase is often normal
- Plain abdominal x-ray may show pancreatic calcification
- CT or MRI is the most useful investigation for imaging the pancreas
- May confirm pancreatic enlargement, fibrosis and calcification
- ERCP has a high sensitivity for detecting chronic pancreatitis
- Pancreatic function test rarely provide useful information
- Direct tests - e.g. secretin-pancreozymin test, Lundh test
- Indirect tests - e.g. serum trypsin, faecal fat analysis
- On imaging criteria it can be difficult to differentiate chronic pancreatitis from carcinoma

Alcohol-Induced Chronic Pancreatitis

- **Characteristic features:**
- Have a history of 5-15 yrs heavy drinking before the 1st attack
- Characteristic time interval of 18-48 hrs between a binge and the onset of an attack
- Prolonged socially acceptable drinking -- may also induce pancreatitis
- Complications & the development of calcification are common

Alcohol-Induced Chronic Pancreatitis

- **Calcifying Pancreatitis**
- Pancreatic calcification: 25-50% of alcohol-induced chronic pancreatitis
- Tend to develop about 8 yrs after the initial attack
- May present at the time of 1st attack to 40 yrs after 1st attack
- About 1/3 patients present with D.M. with or without steatorrhea
- About 1/2 patients have mild to severe attack or with persisted pain (cyst).

Alcohol-Induced Chronic Pancreatitis

- **Investigations**
- Raised ESR, white count, serum bil., Alk-P & amylase levels
- Serum amylase: 375-1125 IU/L(200-600 somogyi units/100 ml)
- Abnormal pancreatic function test
- Characteristic features on ERCP
- Abnormal GTT
- Increase fat excretion in more advanced form
- Characteristic calcification in the pancreatic region on plain abdominal X-ray film

Pancreatic carcinoma

- Pancreatic carcinoma is the second commonest tumour of the digestive system
- The incidence is increasing in the Western world
- It is uncommon less than 45 years of age
- More than 80% of cases occur between 60 and 80 years of age
- Male : female ratio is 2 : 1
- Most tumours are adenocarcinomas
- More than 80% occur in the head of the pancreas

- **Clinical features**
- 30% present with obstructive jaundice
- Classically described as 'painless jaundice'
- Most develop pain at some stage - 50% present with epigastric pain
- 90% develop anorexia and weight loss
- 75% have metastases at presentation

- **Classification:**
- Acinar cell adenoCA.
- Ductal cell
- Solid carcinoma
- AdenoCA.
- Anaplastic CA.
- Squamous cell CA.
- CystadenoCA.

- **Cystadenocarcinoma**
- Rare
- Earlier age: 1/3 of patients are less than 50 yrs old.
- Female predominant -- F:M=9:1
- Few symptoms & poorly defined, non-tender, upper abd. mass.
- Canbe removed with ease -- complete excision.
- Frequently derived from the distal portion of the gland and fibrous reaction.
- Prognosis: long-term survival is possible.
- **Solid Adenocarcinoma**
- The most common CA. of the pancreas : solid adenoCA. of ductal cell origin.
- Mean age of the onset: 55 yrs of age.
- M:F=2:1
- Head: 70%, Body: 20%, Tail: 10%.
- Possible predisposing factors: Smoking, Chronic pancreatitis, Heavy alcohol intake, & D.M.

Pancreatic imaging

- **Ultrasound**
- Abdominal ultrasound has sensitivity of about 80% for the detection of pancreatic cancer
- Detects level of biliary obstruction, excludes gallstones and may identify pancreatic mass
- Doppler ultrasound allows assessment of vascular invasion

- **Computerised tomography**
- Spiral CT has improved on resolution of conventional CT
- Has sensitivity of greater than 95% for detection of pancreatic tumours
- Contrast-enhanced triple-phase imaging is modality of choice
- Probably the most useful of staging investigations
- Both US and CT often fail to detect small (< 2 cms) hepatic metastases

- **Laparoscopy**
- Laparoscopy will identify liver or peritoneal metastases in 25% of patients deemed resectable after conventional imaging
- Laparoscopic ultrasound has improved predictability of resection
- Mesenteric angiography is now considered obsolete
- Hypotonic duodenography (HDG)
- D.D. between chronic pancreatitis and tumor is difficult
- Usually are abnormal only when the lesion is large. False negative up to 20% even in head tumor

- Angiography: positive rate 75-90%
- D.D. between Chronic Pancreatitis and CA is difficult.
- In case with previous abdominal surgery -- has little contribution

- Endoscopic retrograde holangiopancreatography(ERCP)
- ERCP is highly sensitive for helping detect pancreatic carcinoma. Of patients with pancreatic adenocarcinoma, 90-95% have abnormalities on ERCP findings. However, the changes seen on ERCP are not always highly specific for pancreatic carcinoma and can be difficult to differentiate from changes seen in patients with chronic pancreatitis.
- ERCP is more invasive than the other diagnostic imaging modalities available for pancreatic carcinoma. ERCP also carries a 5-10% risk of significant complications with the procedure.

- **A. Laboratory data**
- Serum & urine amylase: mildly elevated in a few P't
- GTT: Abnormal in 25-50% of patients
- Secretin-pancreazymin test Tumor: greatly diminished volume flow but normal HCO3 conc.
- Chronic pancreatitis: volume flow normal but HC03 conc. and amylase secretion are reduced

- **Serologic test**
- Carcinoembryonic Antigen(CEA): positive
- Non-specific, major use in detecting recurrent cases.
- CEA (+) in:
  Adv. Ca. of the pancreas (up to 95%)
  Ca. of the colon
  Chr. pancreatitis, ...,etc.
- CA 19-9 : positive (>75u/ml)
  sensitivity >85% & specificity > 90% in adv. pancreatic Ca.
- **C. Cytologic exam. of pancreatic excretion:** 30-70% (+)

- Morphology: Location - 60% in head, 15% in body, 5% in tail, 20% diffuse. Most (88%) arise from ductal epithelium. Many (75%) secrete mucin. Often have abundant fibrous stroma. Extend through retroperitoneum impinging nerves, invade spleen, adrenals, vertebrae, colon, stomach, local lymph nodes

- Prognosis: Only 10-20% of tumors are respectable at presentation. If resectable, 5-yr survival is 4-27%. If tumor is <2cm, 5 year survival is 35%. Median survival after chemo is <20 wks.

- **TNM definitions Primary tumor (T)**
  - **TX: Primary tumor cannot be assessed**
    T0: No evidence of primary tumor
    Tis: In situ carcinoma
    T1: Tumor limited to the pancreas 2 cm or less in greatest dimension
    T2: Tumor limited to the pancreas more than 2 cm in greatest dimension
    T3: Tumor extends directly into any of the following: duodenum, bile duct,
    - **or peripancreatic tissues**
- **T4: Tumor extends directly into any of the following: stomach, spleen,**
  - **colon, or adjacent large vessels**
- **Regional lymph nodes (N)**
  NX: Regional lymph nodes cannot be assessed
  N0: No regional lymph node metastasis
  N1: Regional lymph node metastasis
- **Distant metastasis (M)**
  MX: Distant metastasis cannot be assessed
  M0: No distant metastasis
  M1: Distant metastasis

- AJCC stage groupings
- Stage 0
  - Tis, N0, M0
- Stage I
  - T1, N0, M0
    T2, N0, M0
- Stage II
  - T3, N0, M0
- Stage III
  - T1, N1, M0
    T2, N1, M0
    T3, N1, M0
- Stage IVA
  - T4, Any N, M0
- Stage IVB
  - Any T, Any N, M1

Treatment

- Treatment: Whipple procedure (pancreaticoduodenectomy with choledocojejunostomy) improves survival if resectable.
- Operative mortality is 2-20%. Some surgeons attempting lymph node dissection. Choledocojejunostomy alone to relieve obstructive symptoms if not respectable.
- ERCP stenting of CBD to relieve symptoms. Radiation for palliation and debulking.
- Some chemo available (5-FU and Gemcitibine) but little mortality benefit and small response rates.