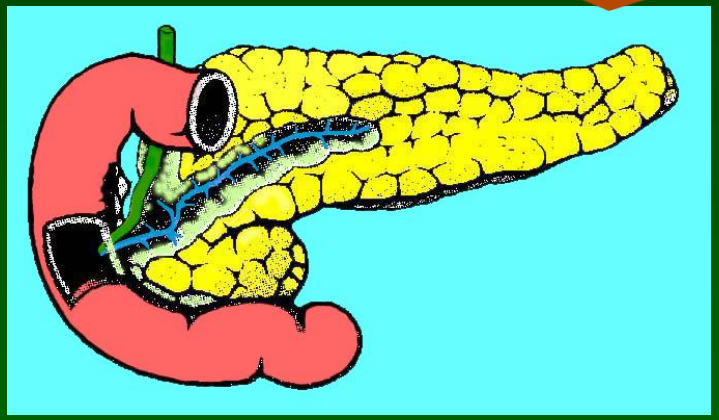
PANCREAS



Attila Zalatnai

INVOLVEMENT OF THE PANCREAS IN GENETICAILLY DETERMINED DISEASES

Cystic fibrosis (mucoviscidosis)

Skin → Increased NaCl-content of the sweat

Bronchi → recurrent infections

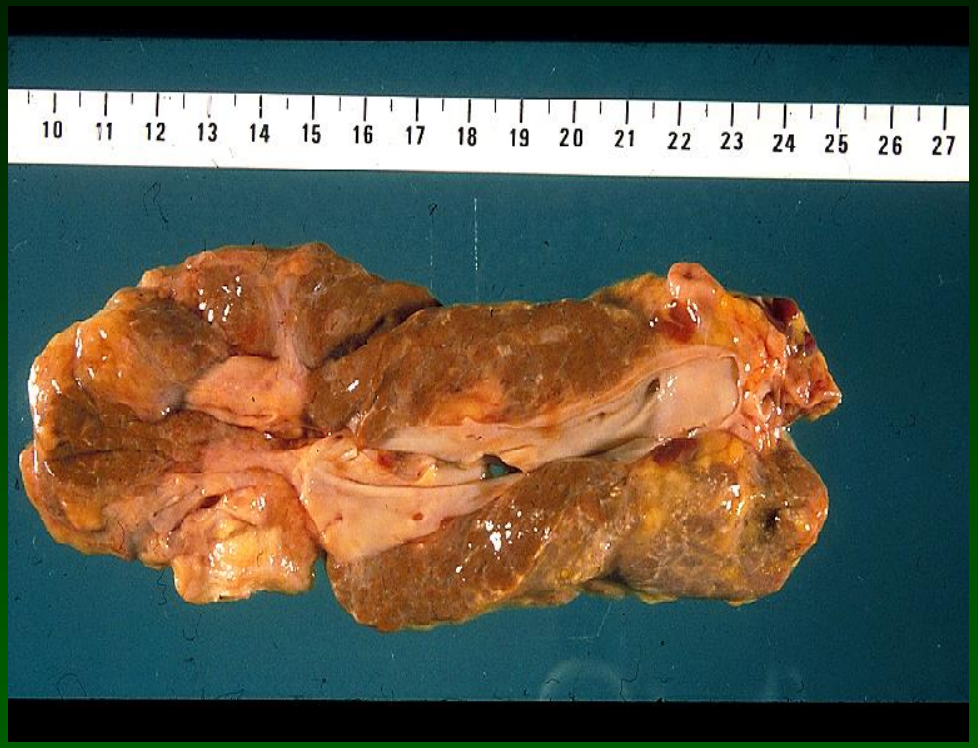
Small bowel → meconium-ileus

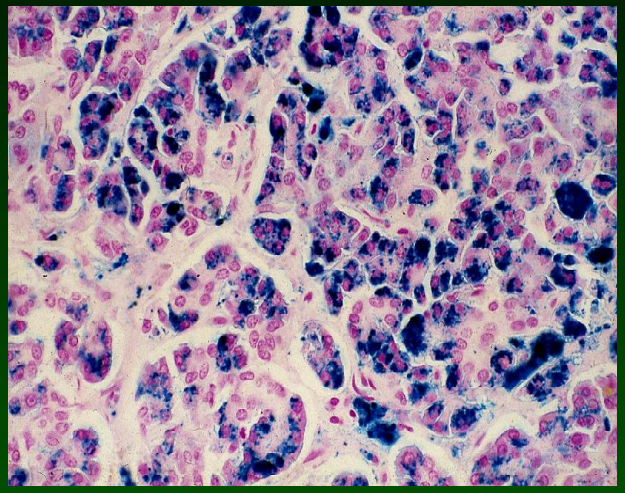
Pancreas → obstruction → fibrosis → pancreatic insuff.

Hemochromatosis ("bronze-diabetes")

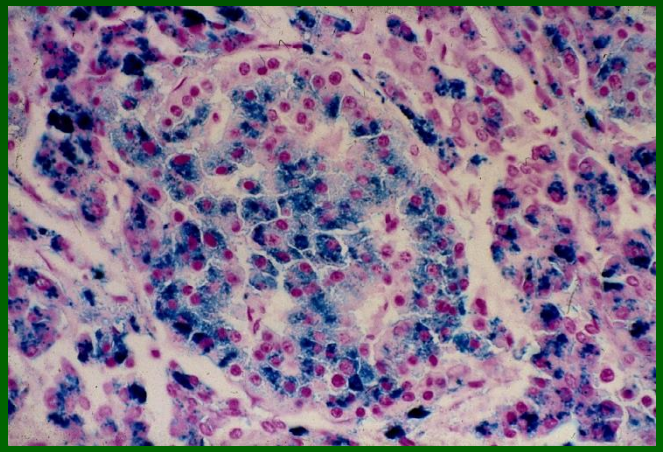
Skin, liver, pancreas, heart, testicles, hypophysis…

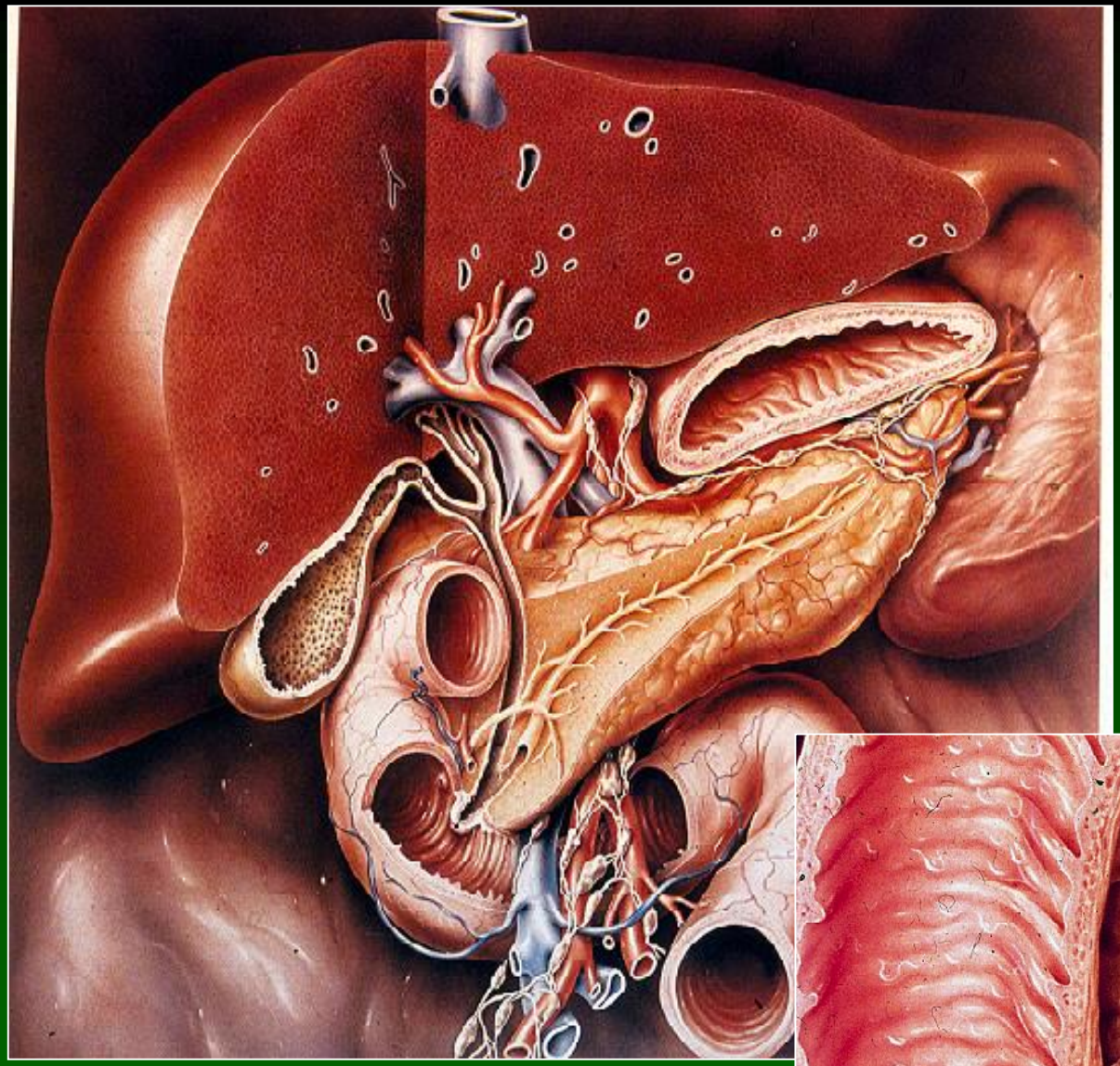
HEMOCHROMATOSIS

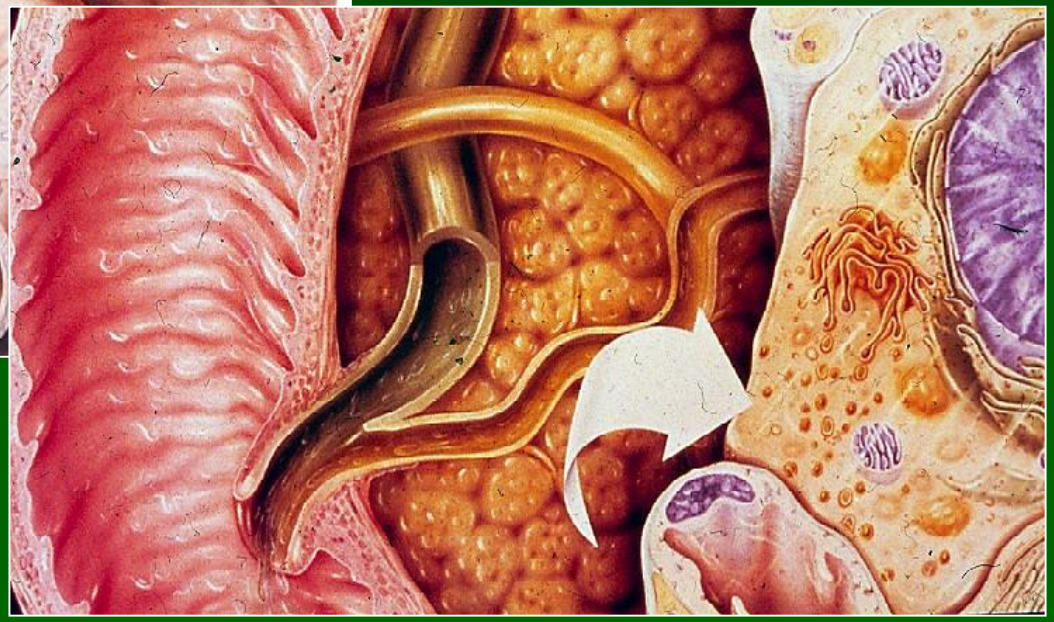




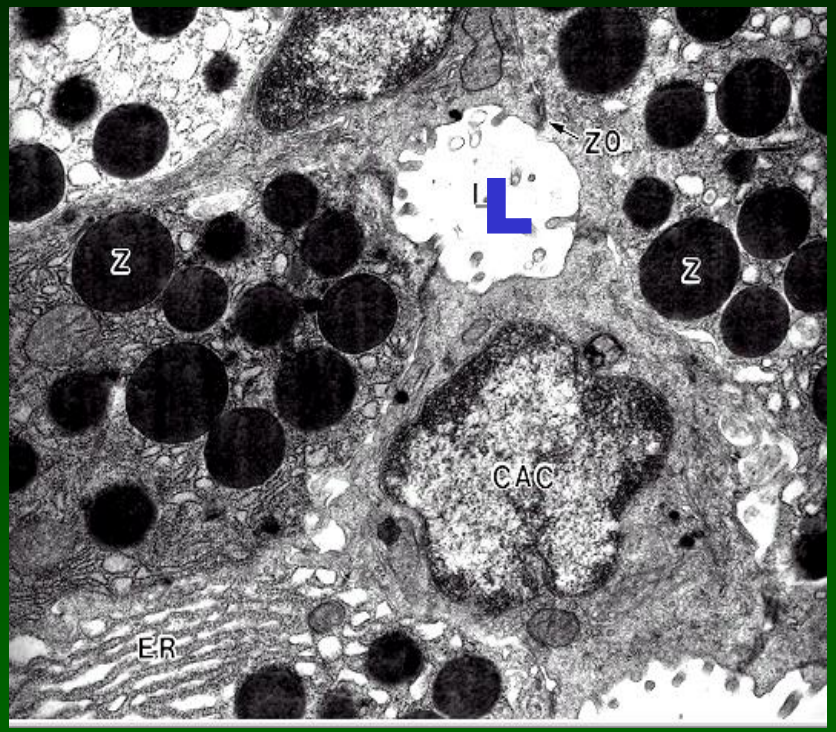
(Prussian blue)







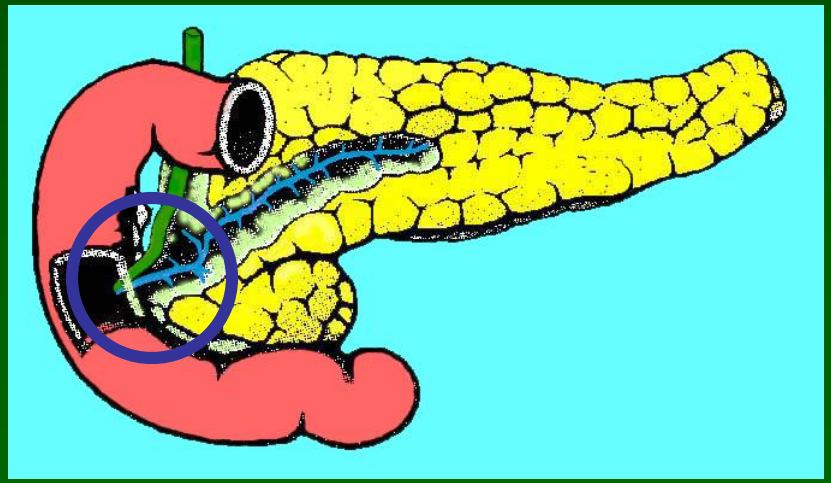
MAIN ENZYMES OF THE PANCREAS



Trypsinogen
Chymotrypsinogen
Proelastase 1, 2
Procarboxypeptidase
A1-A2, B1-B2
Phospholipase
Lipase
Amylase
Non spec. carboxylesterase
RNase
DNase
…….

FACTORS PLAYING IMPORTANT ROLE IN THE PATHOGENESIS OF PANCREATITIS

- increased pressure in the pancreatic duct
- duodeno.pancreatic reflux
- bilio.pancreatic reflux
- epithel-damage due to biliary salts
- trypsin-activation



PANCREATITIS FORMS

- Acute pancreatitis
  - interstitial (edematic)
  - hemorrhagic (necrotizing)
- Chronic pancreatitis
  - chr. fibrotizing
  - chr. obstructive
  - autoimmune

CHARACTERSTICS OF THE ACUTE PANCREATITIS FORMS

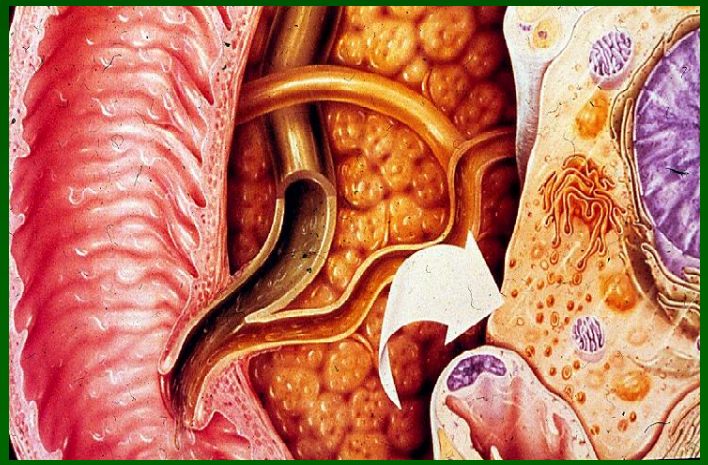
	Frequency	Lethality (%)
Interstitial (edematic)	80 - 90 %	0,3 %
Hemorrhagic (necrotizing)	10 - 15 %	50 - 90 %

ETIOLOGICAL FACTORS IN THE DEVELOPMENT OF ACUTE PANCREATITIS

40 - 50 %: cholelithiasis

30 - 40 %: alcoholism

10 - 30 %: idiopathic



Other causes:

Trauma (surgery!)

Hypercalcemia

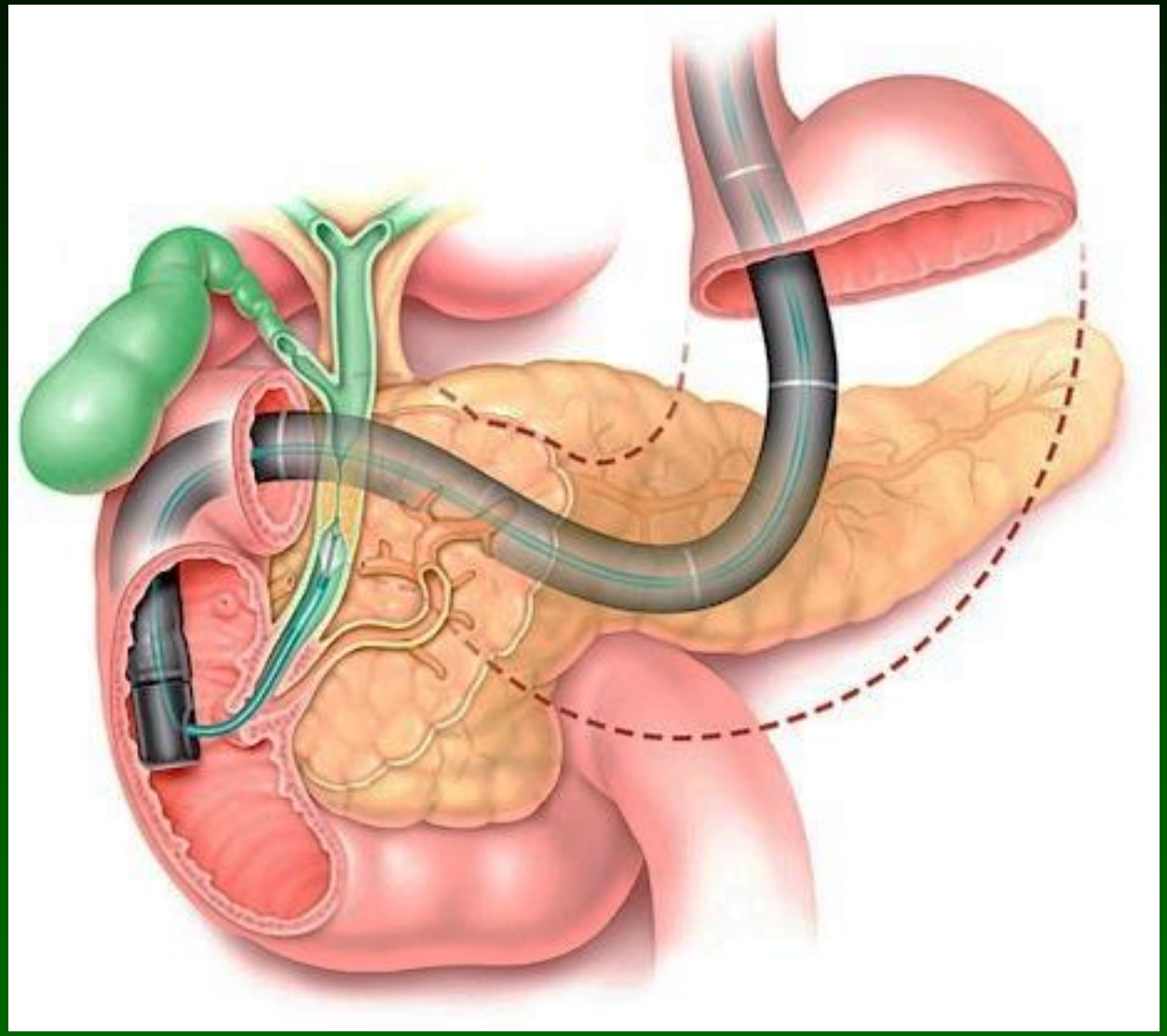
Hyperlipoproteinemia

Vater-papilla obstruction

Infections (viruses)

Iatrogenic (ERCP, lithotripsy)

Familial



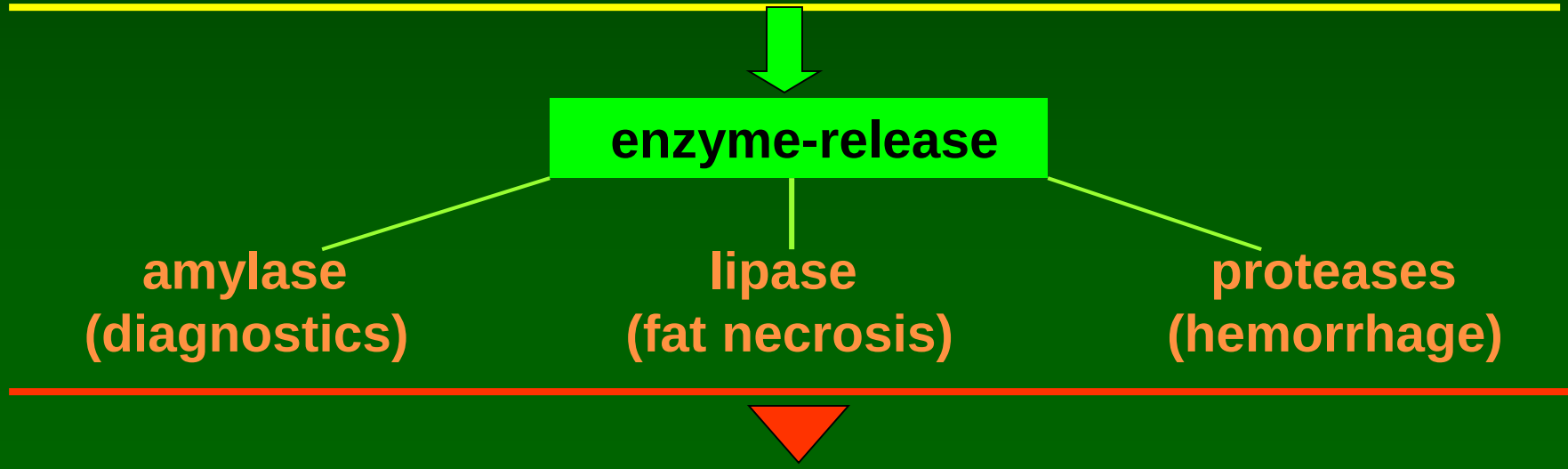
PATHOMECHANISM OF THE ACUTE PANCREATITIS

Acinar damage

- alcohol
- viruses
- trauma
- hypercalcemia
- hyperlipidemia
- medicinal drugs

Ductal obstruction

- cholelithiasis
- cystic fibrosis
- tumors
- Oddi-sphincter edema
- biliary reflux



ACUTE PANCREATITIS

POSSIBLE CONSEQUENCES OF THE ACUTE PANCREATITIS

Local:

- recovery
- fat necrosis
- pseudocyst

⬇

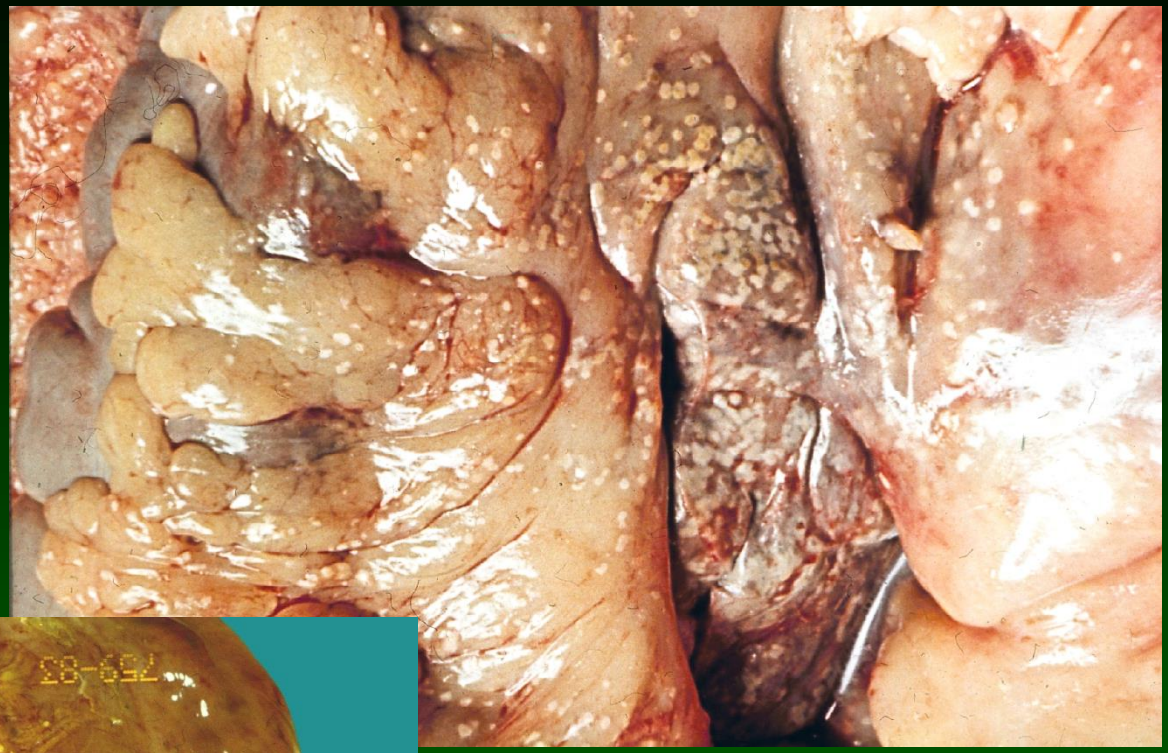
- abscess, ascites
- fistule
- pancreatic apoplexia

⬇

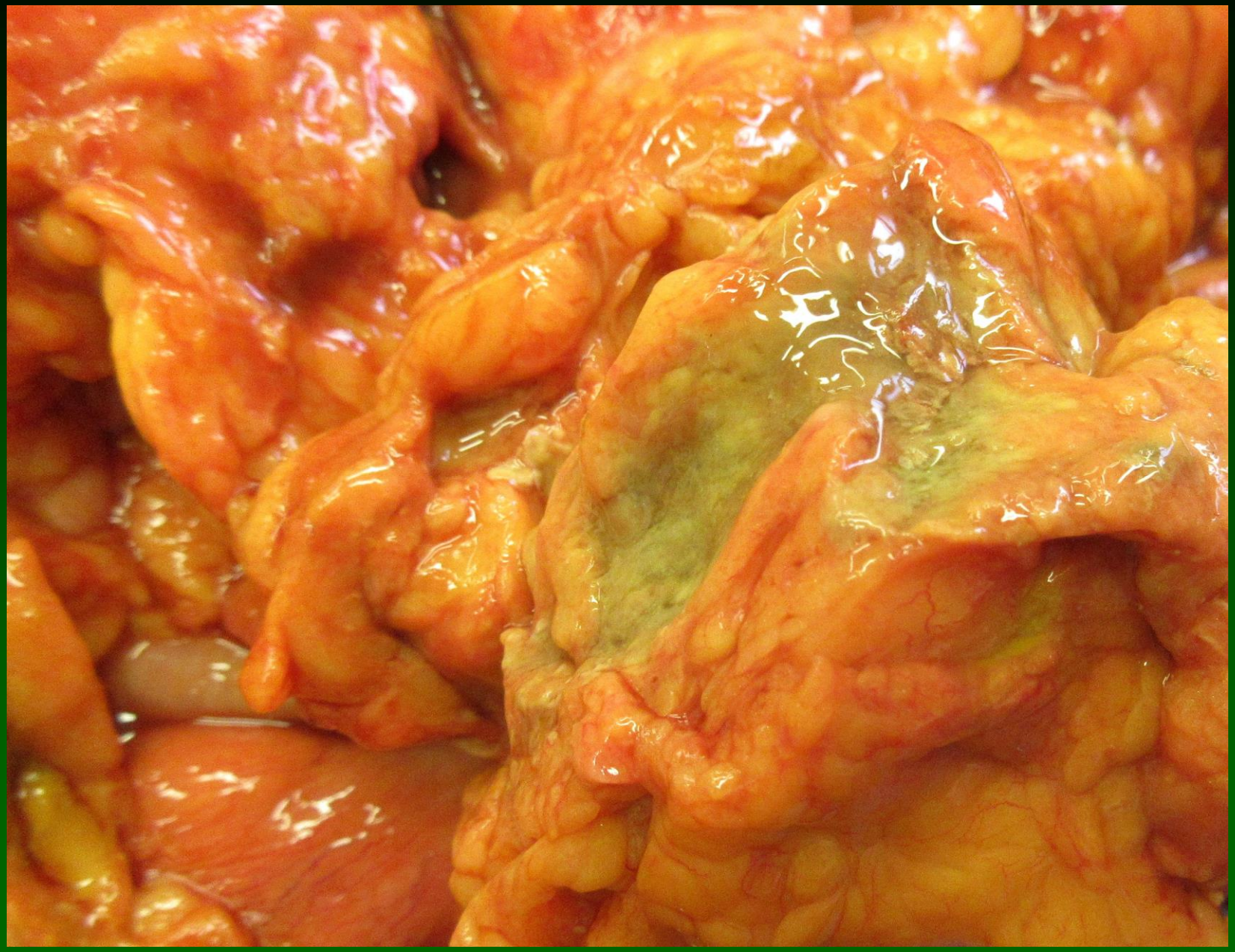
- retroperit. hemorrhage
- digestion of the surrounding organs

Systemic:

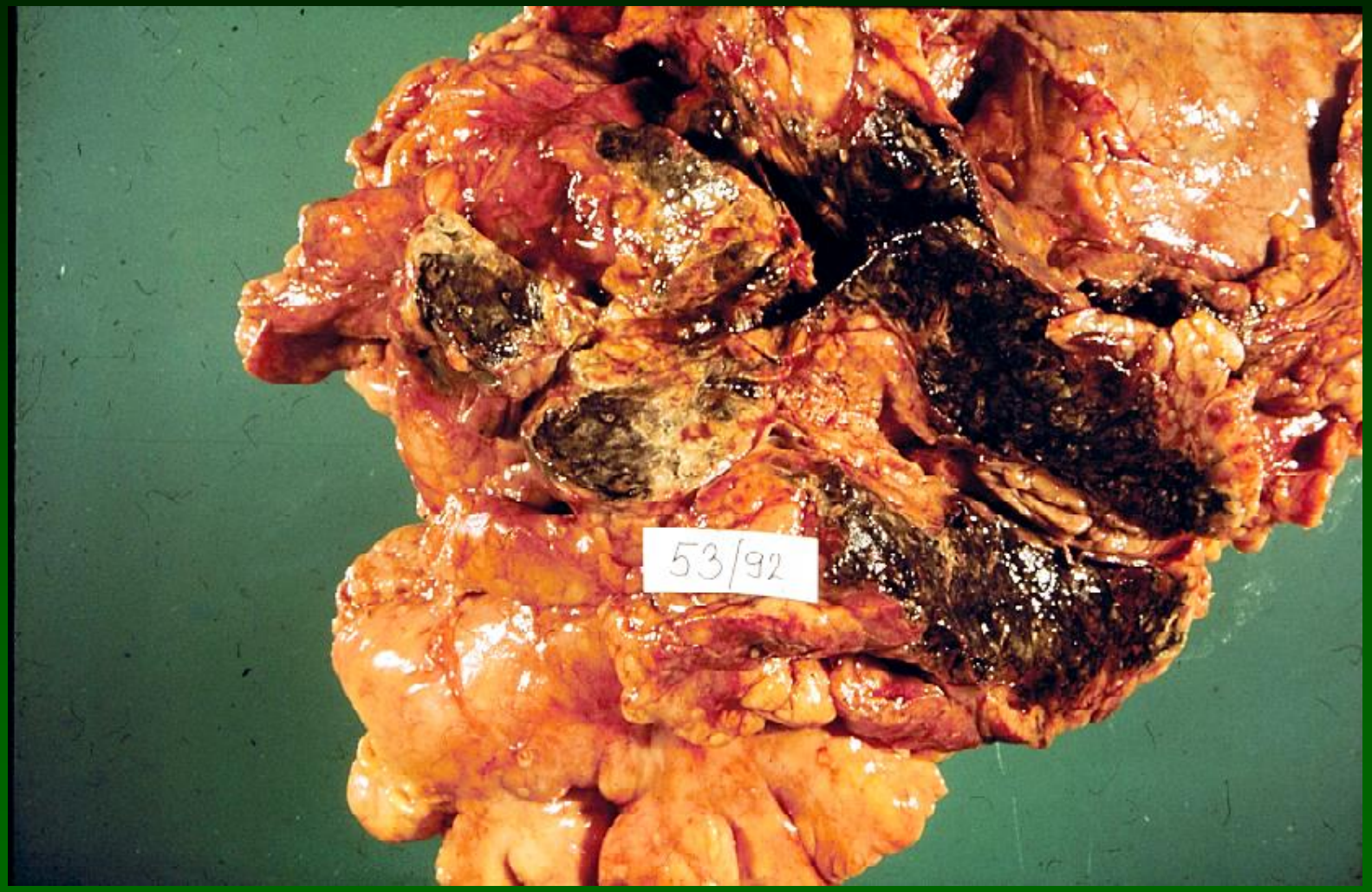
- paralytic ileus
- peritoneal (endotoxin) shock
- peritonitis
- acute renal insufficiency
- DIC
- ARDS, MOF
- diabetes mellitus



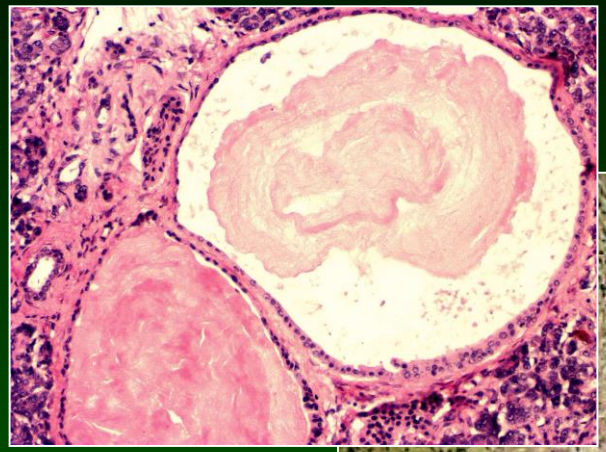

769-83

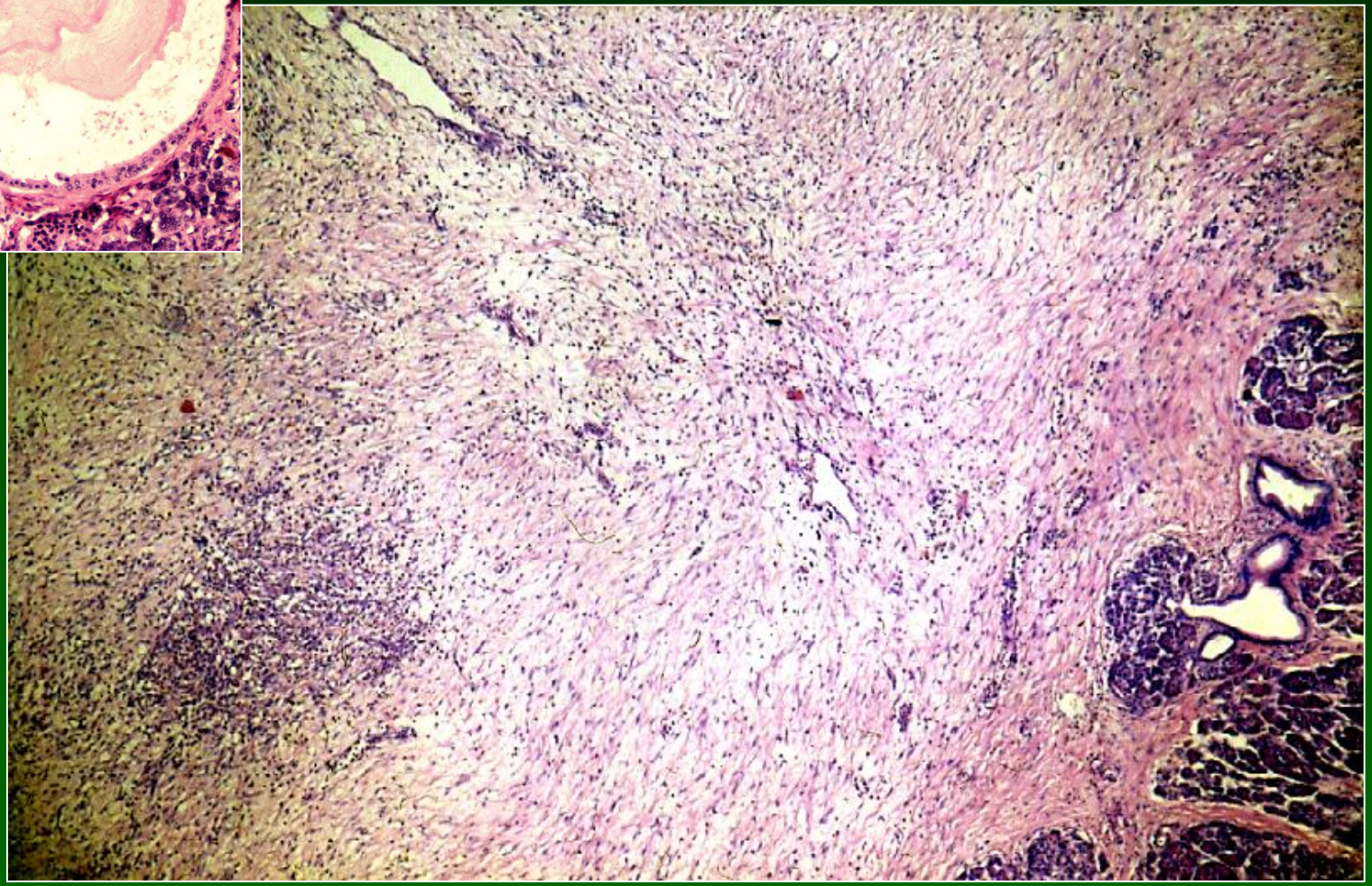


Hemorrhagic pancreatitis (pancreatic apoplexia)

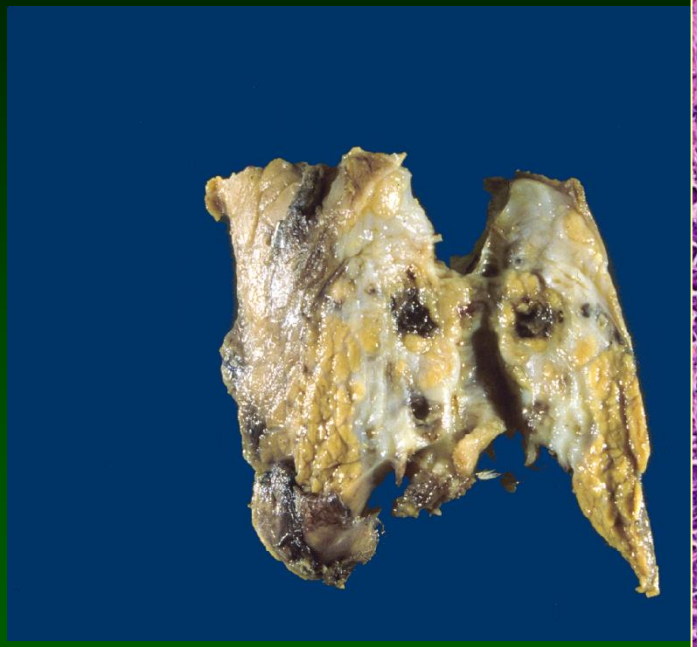


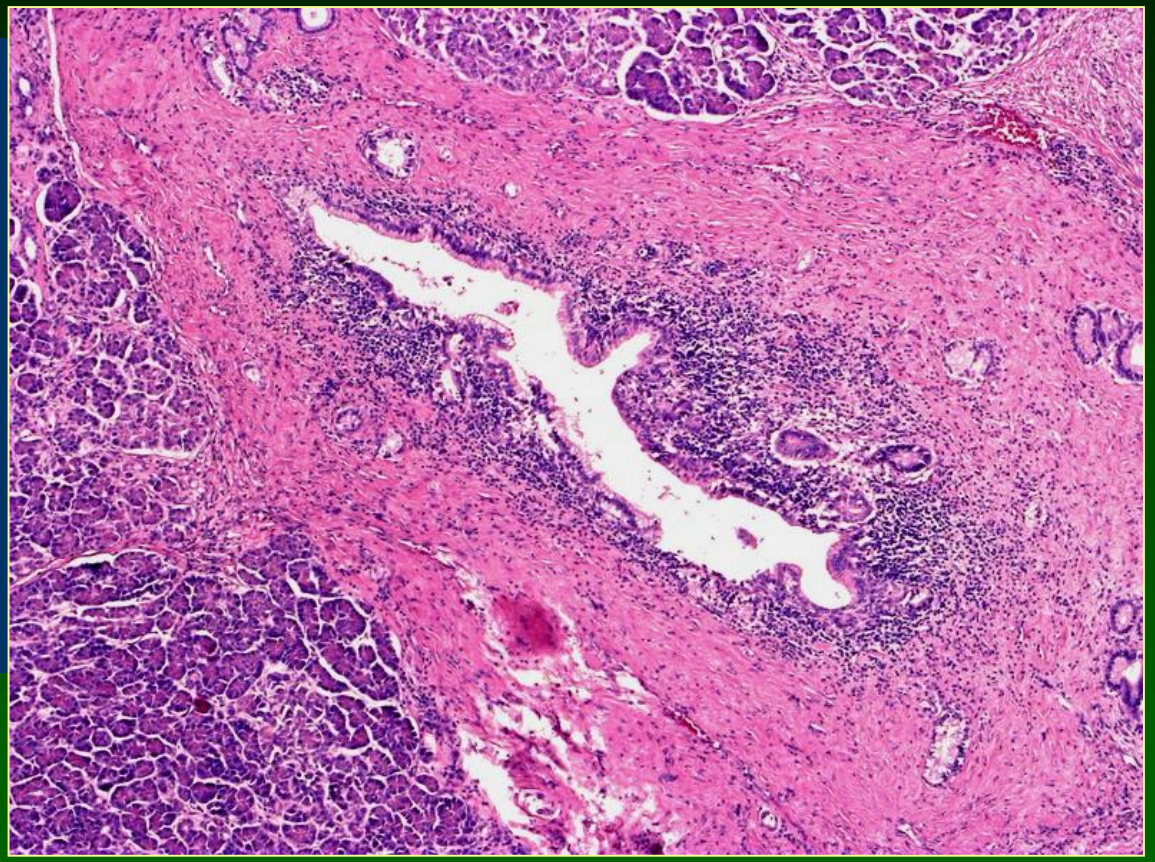
CHRONIC FIBROTIZING PANCREATITIS





AUTOIMMUNE PANCREATITIS





PANCREAS EXOCRINE NEOPLASMS

mucinous cystadenoma → mucinousus cystic tumor w/moderate dysplasia → cystadenocarcinoma

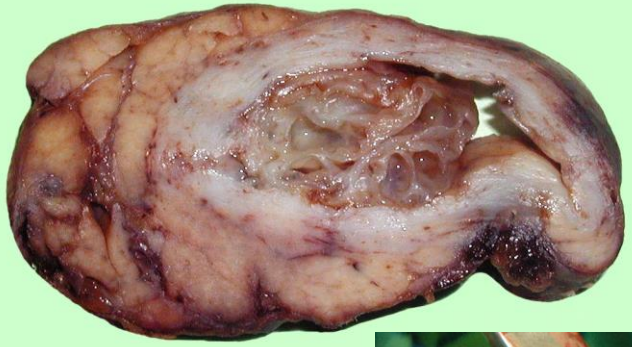
Intraductal papillary-mucinous neoplasia (IPMN)

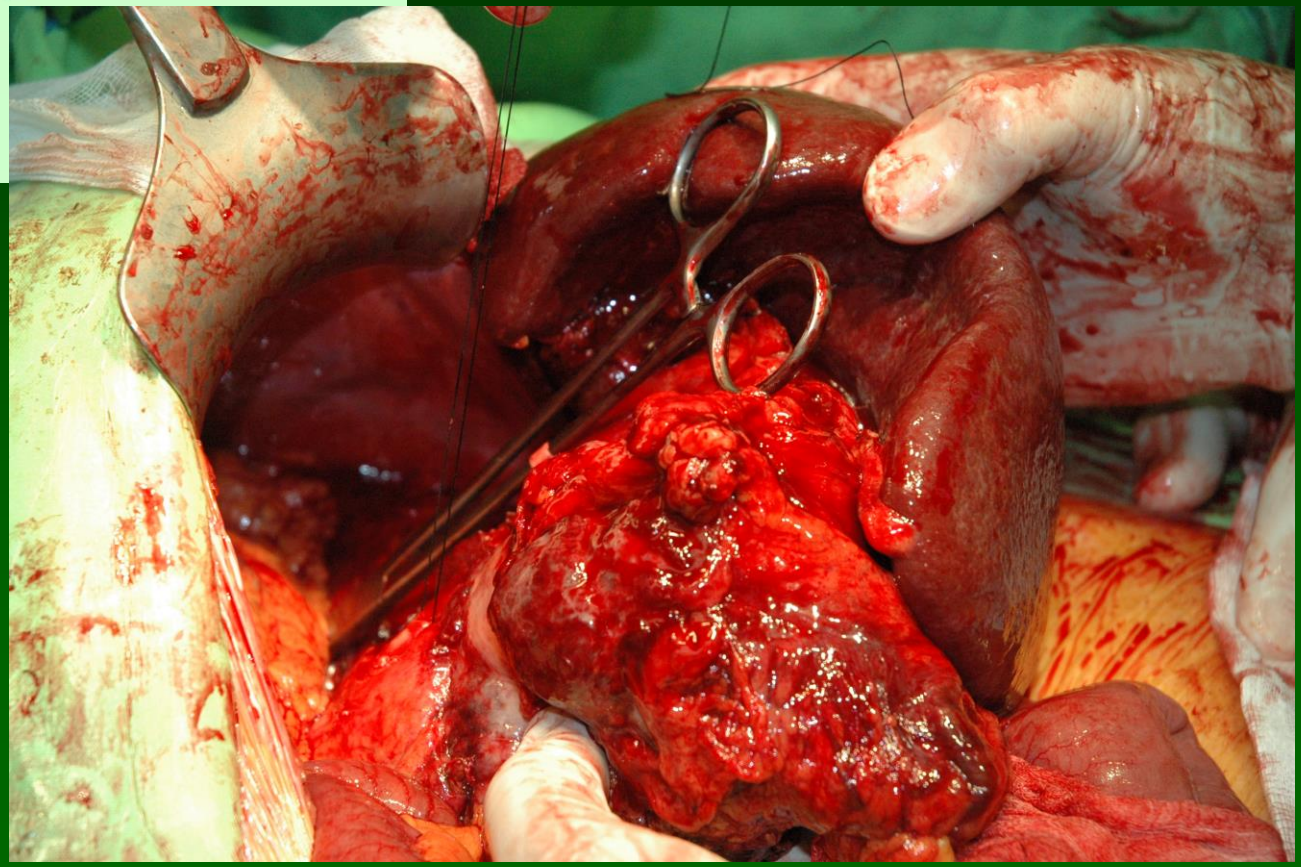
solid-pseudopapillary neoplasia

DUCTAL ADENOCC

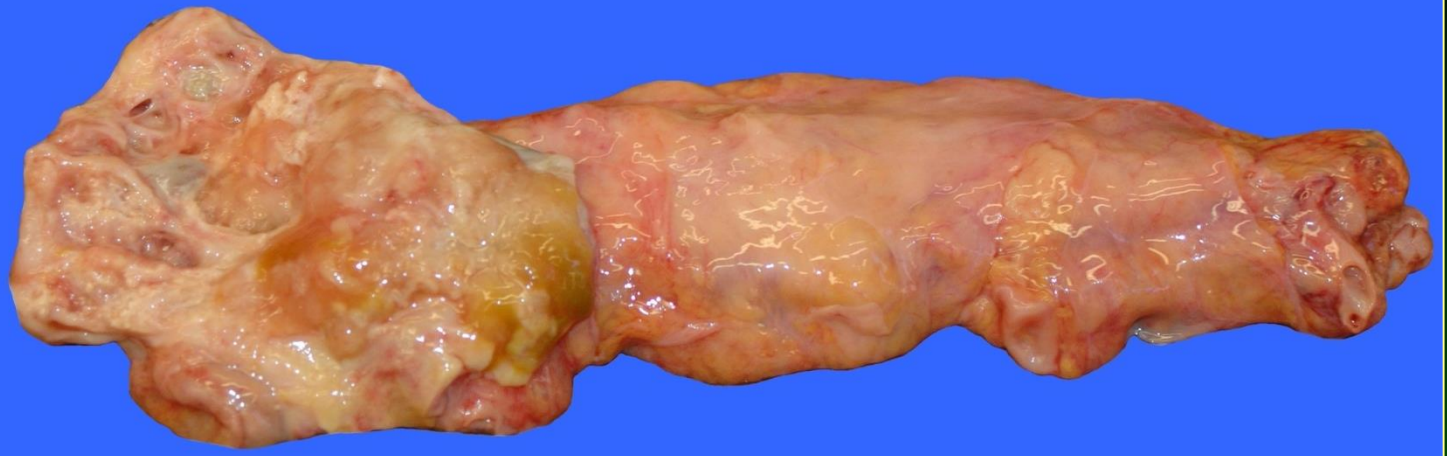
acinar cell carcinoma

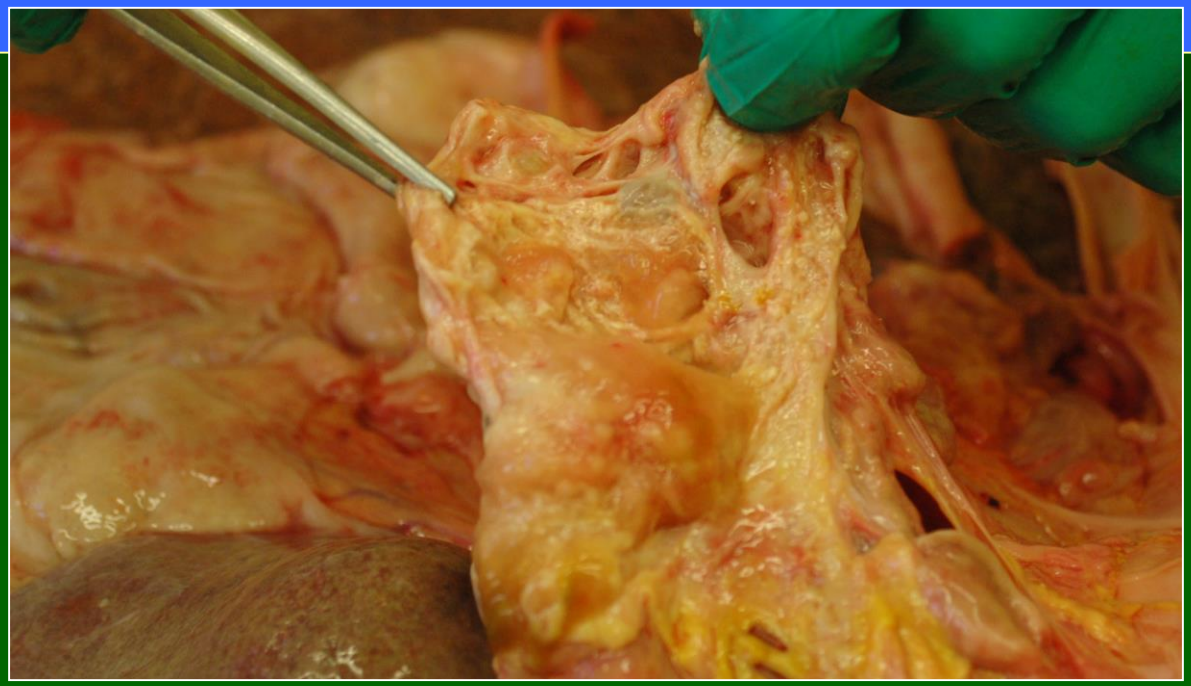
pancreatoblastoma



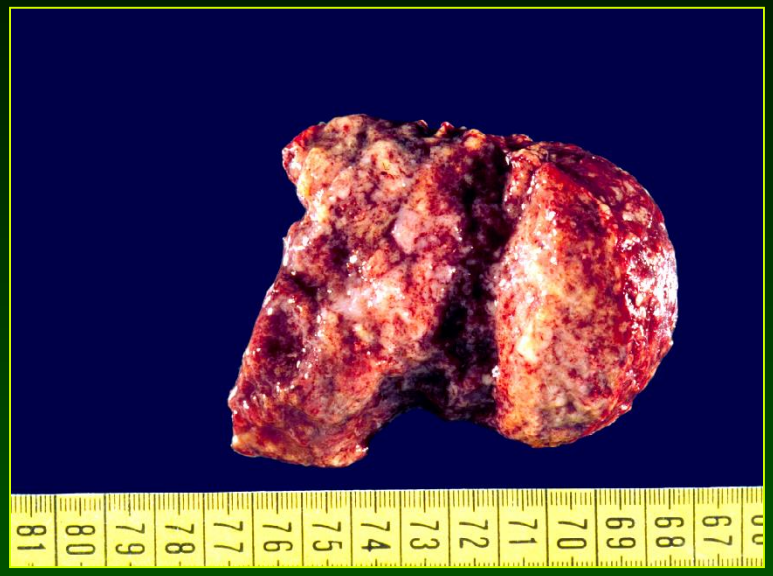


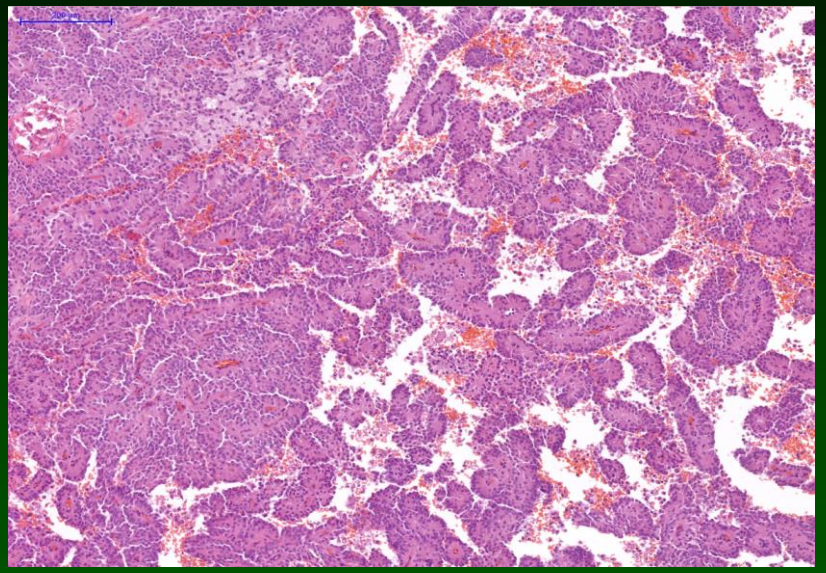
IPMN

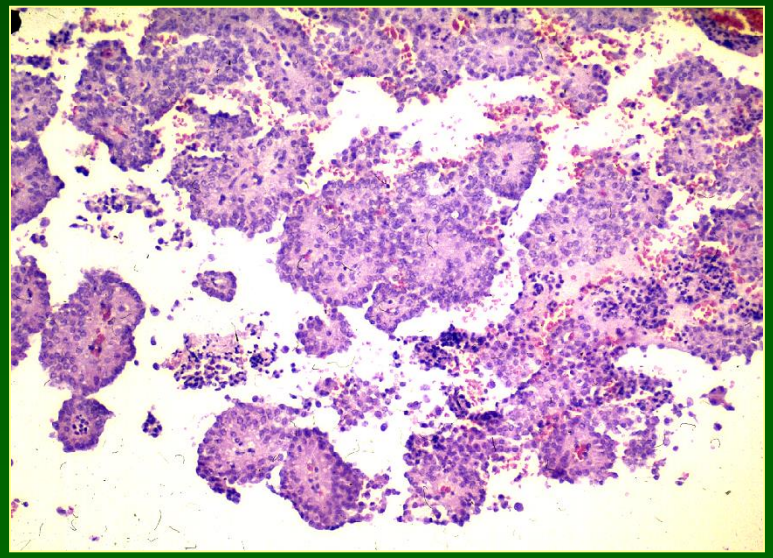


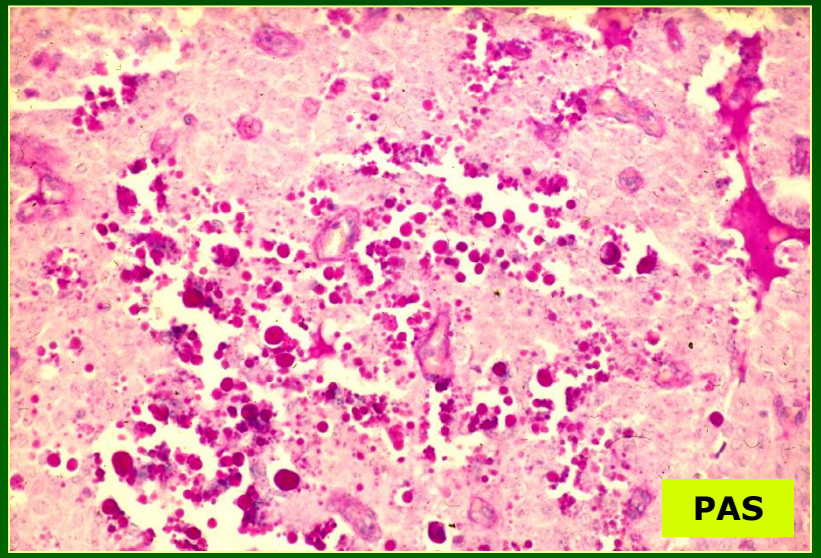


SOLID-PSEUDOPAPILLARY NEOPLASM



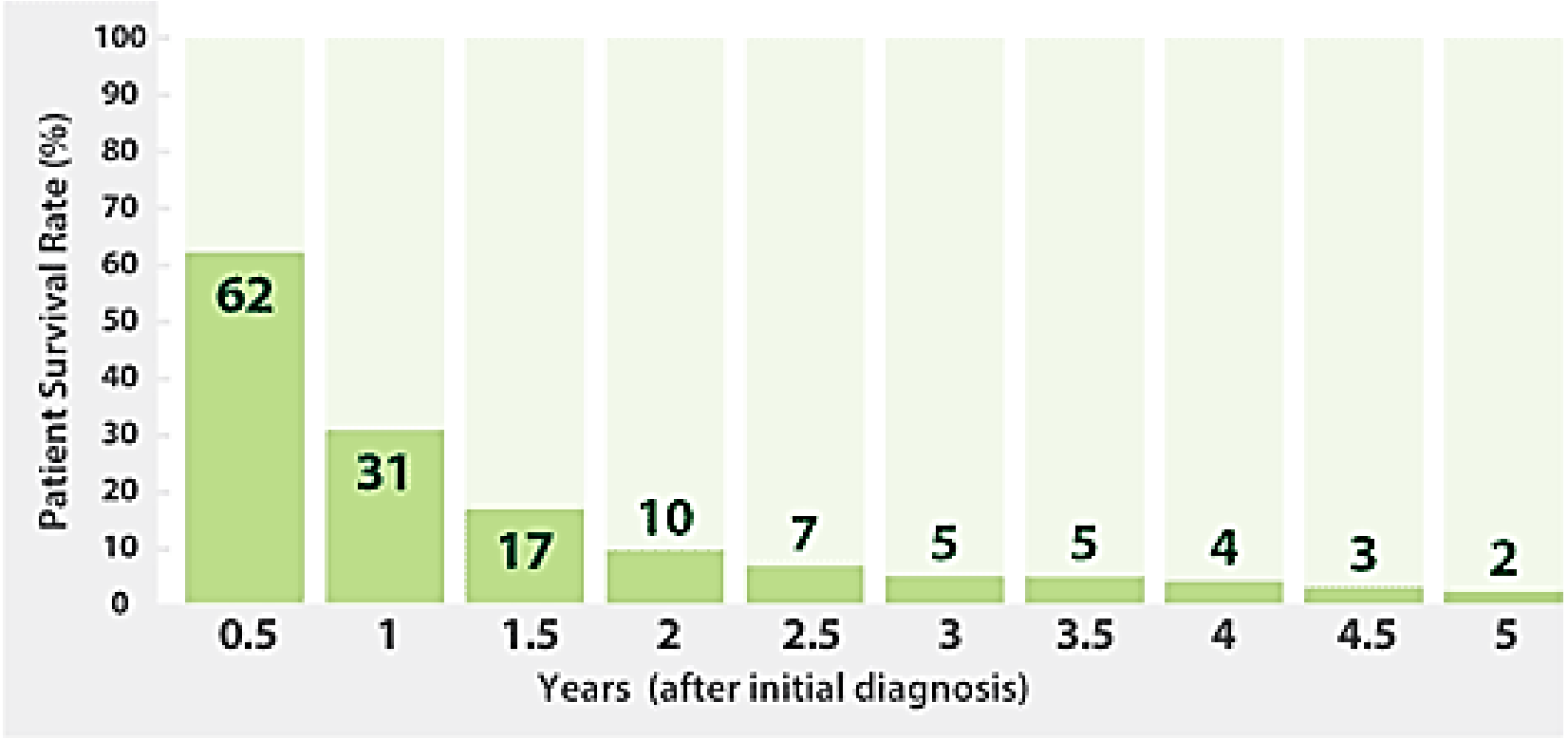






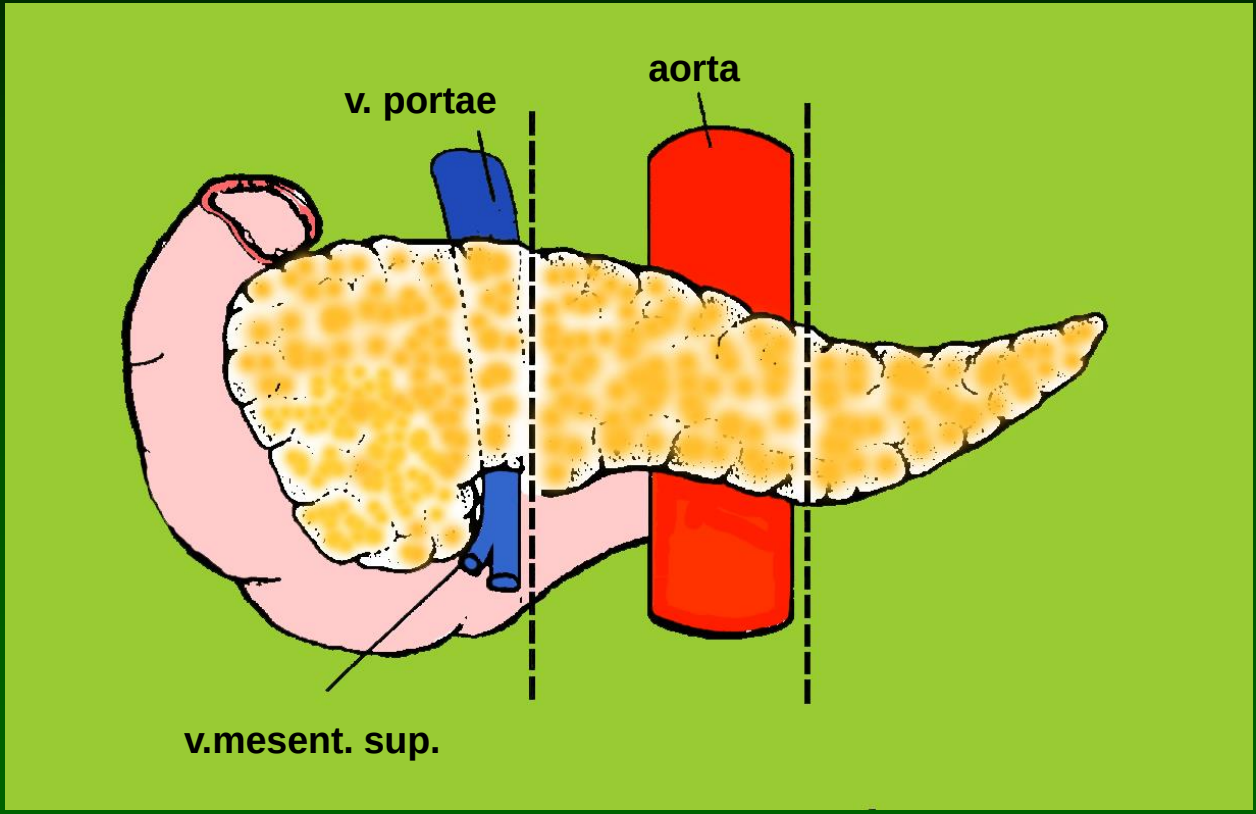
Pancreatic Cancer Survival Rate

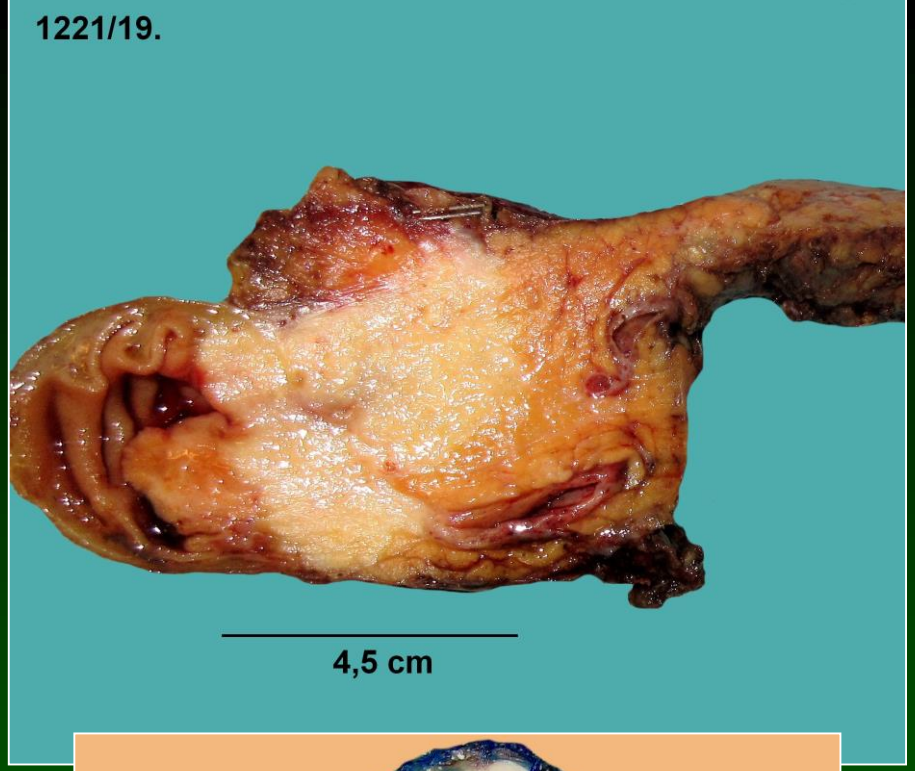
Patients Diagnosed With Distant or Metastatic Cancer
Between 2000-2009
Cancer Treatment Centers of America



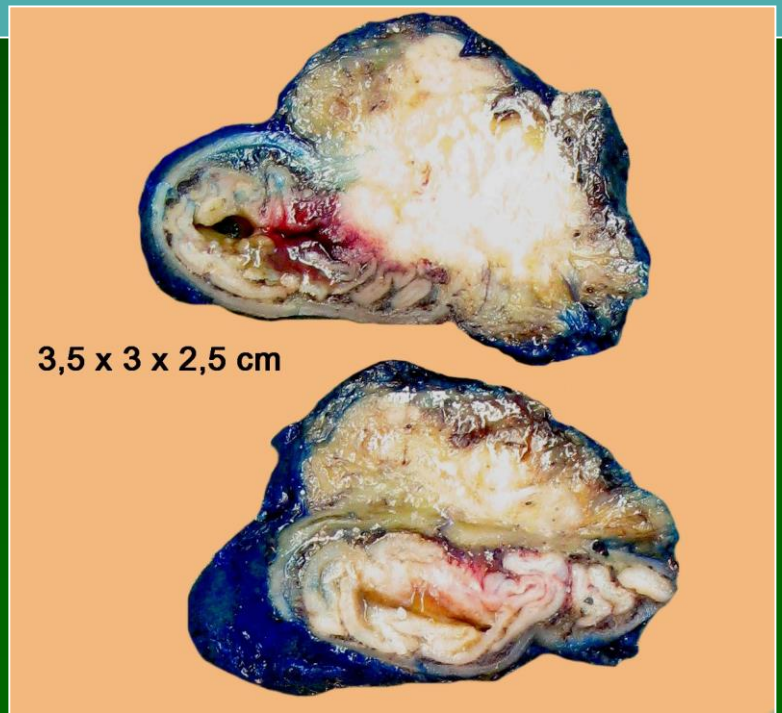
TOPOGRAPHY OF THE PANCREATIC CANCER

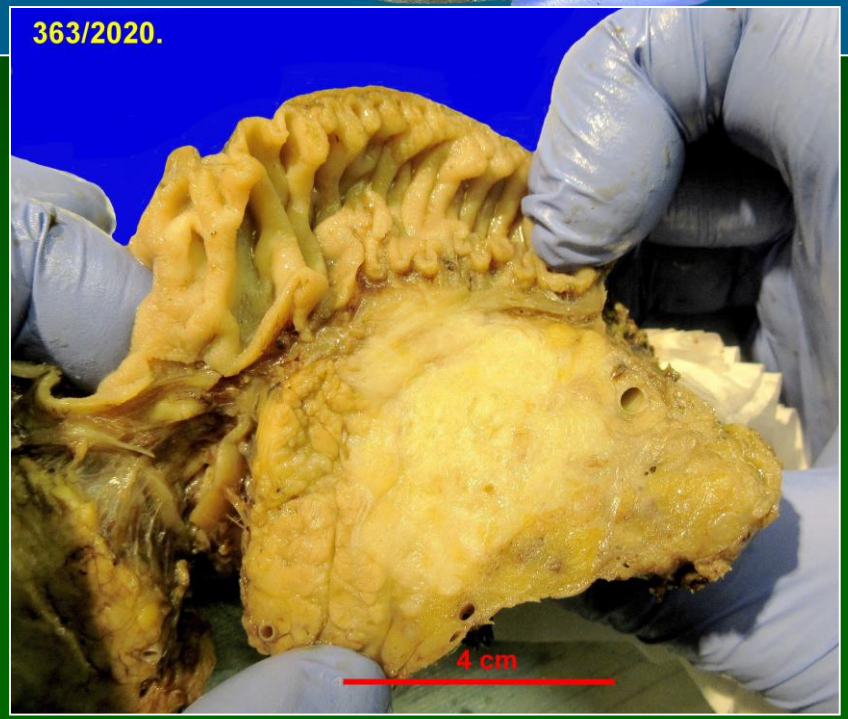
70 % 15 % 15 %

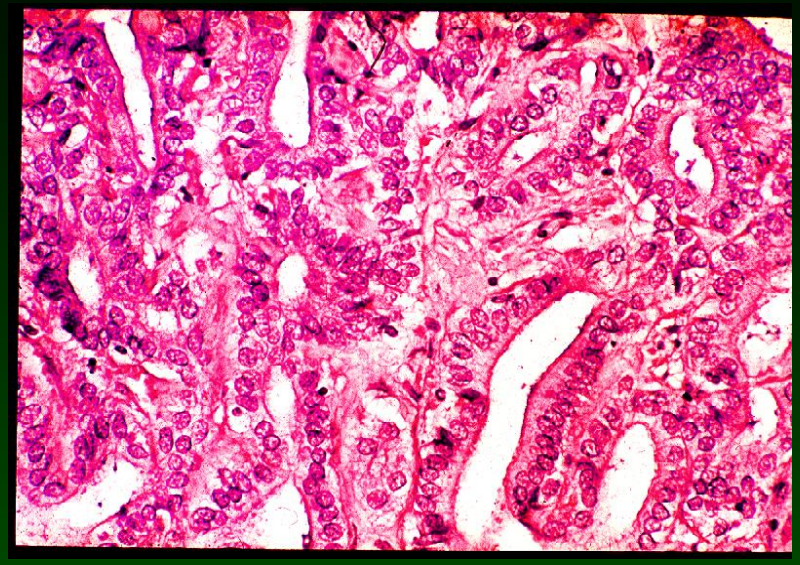


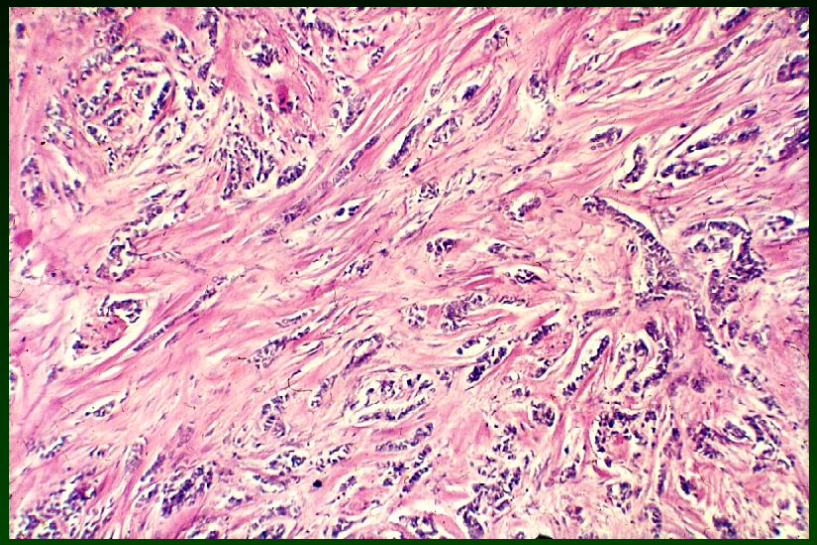

1221/19.
4,5 cm

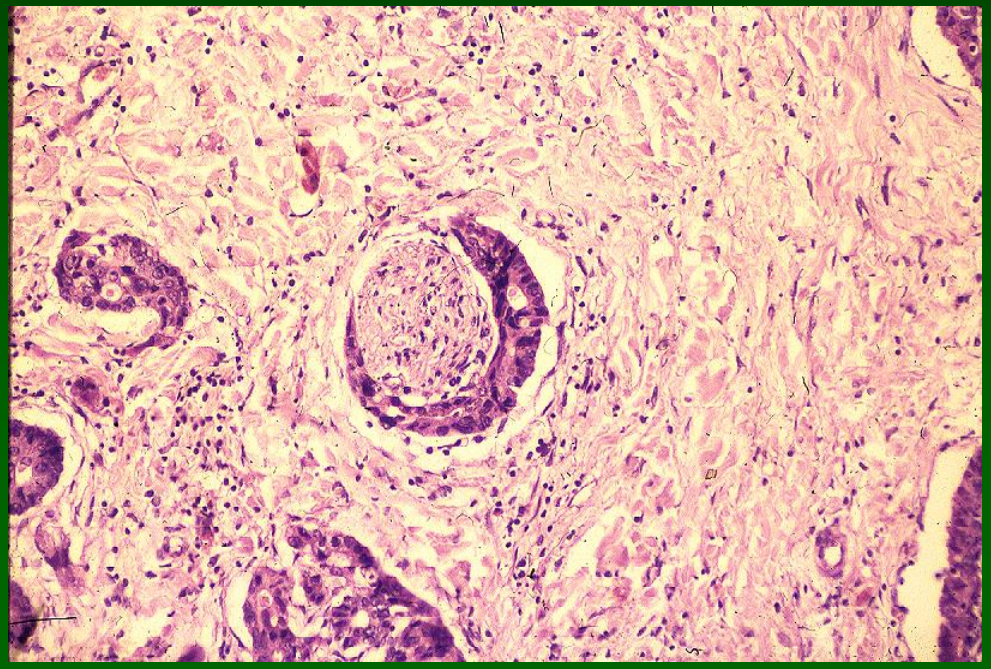

3 cm


3,5 x 3 x 2,5 cm

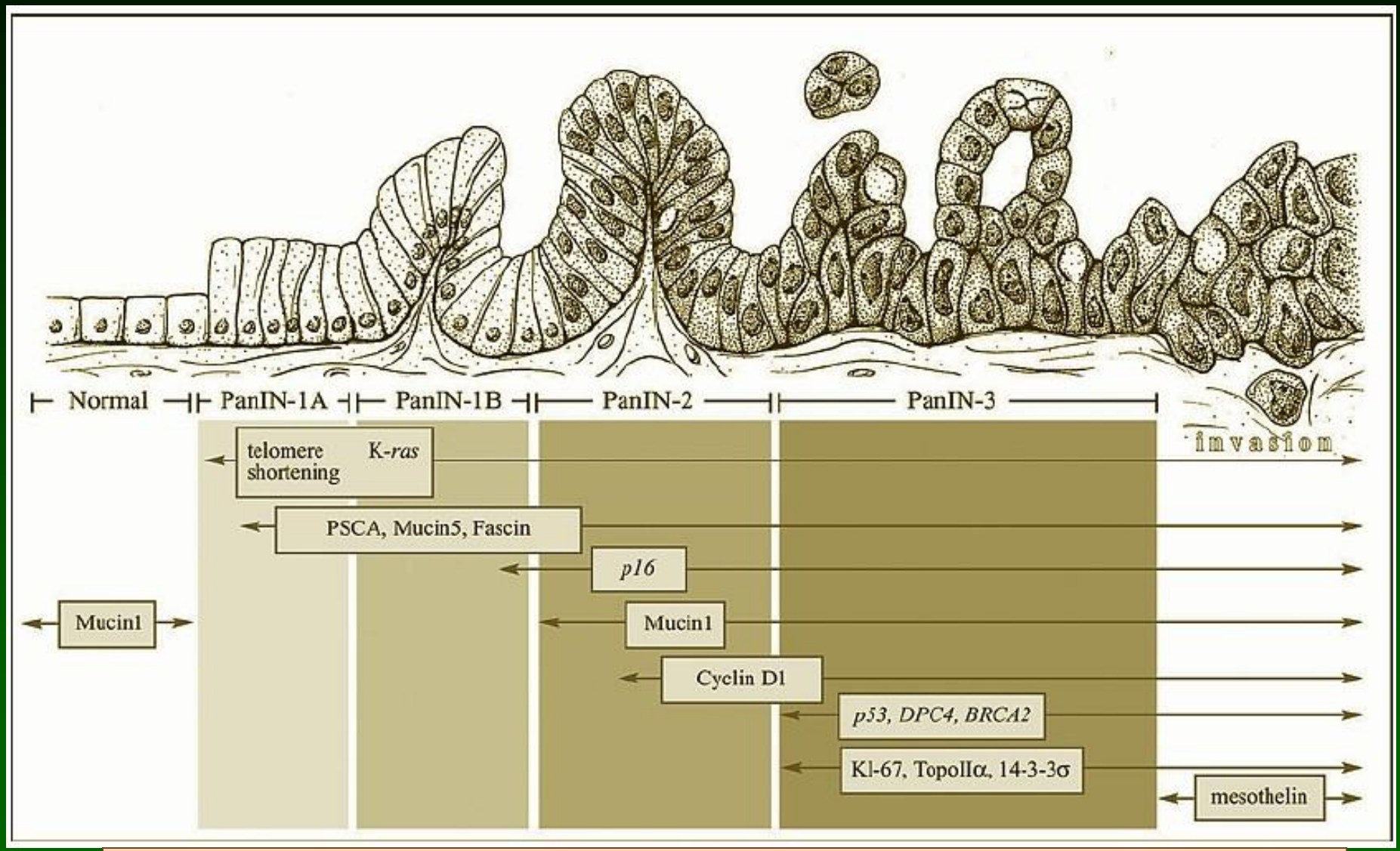

363/2020.
4 cm







PANCREATIC CANCER - NATURAL HISTORY



Ki-67:	0,7%	-	2,3%	-	14,1%	-	22%	-	37%:

COMPLICATIONS OF THE PANCREATIC CANCER

	HEAD	BODY	TAIL
Obstructive icterus	+++	(±)	(±)
Courvoisier-sign	+++	-	-

Trousseau-sign

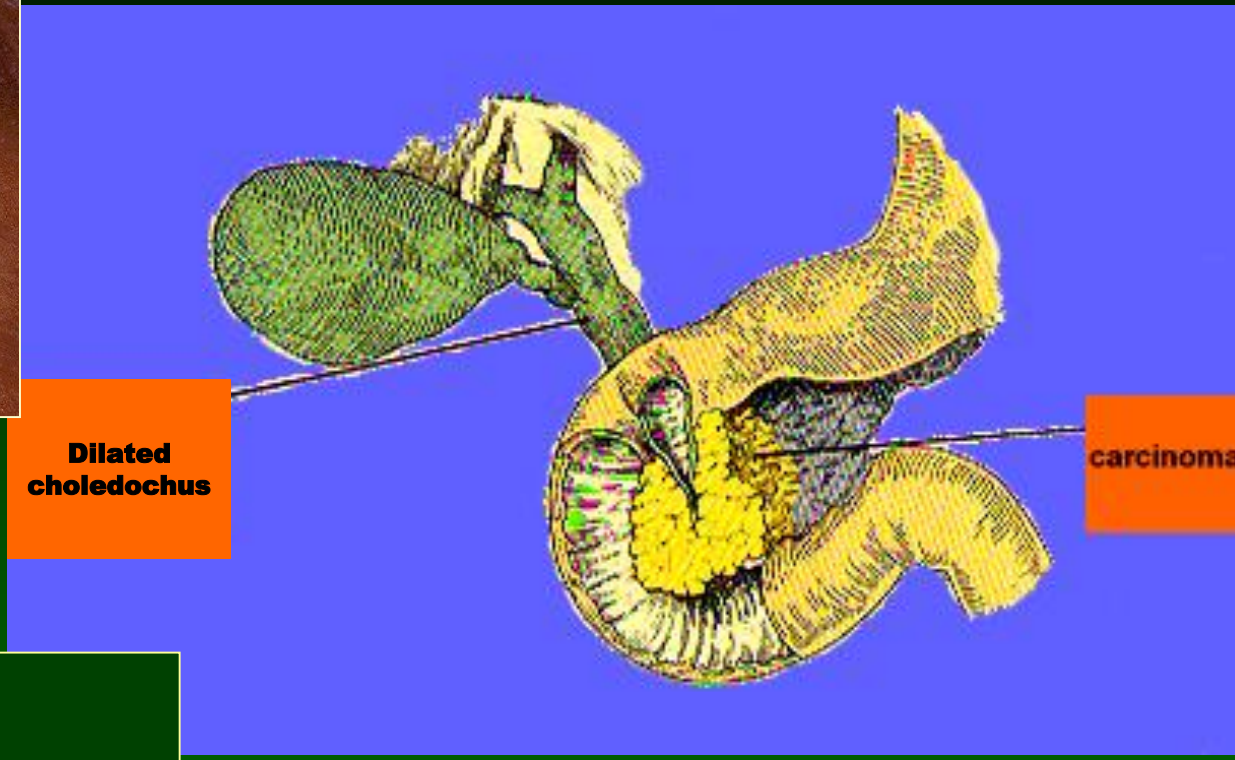
Virchow's node

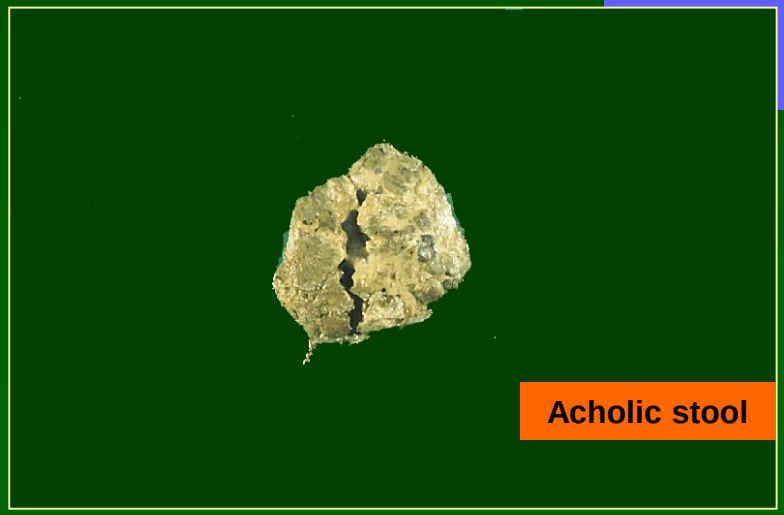
Peritoneal carcinosis

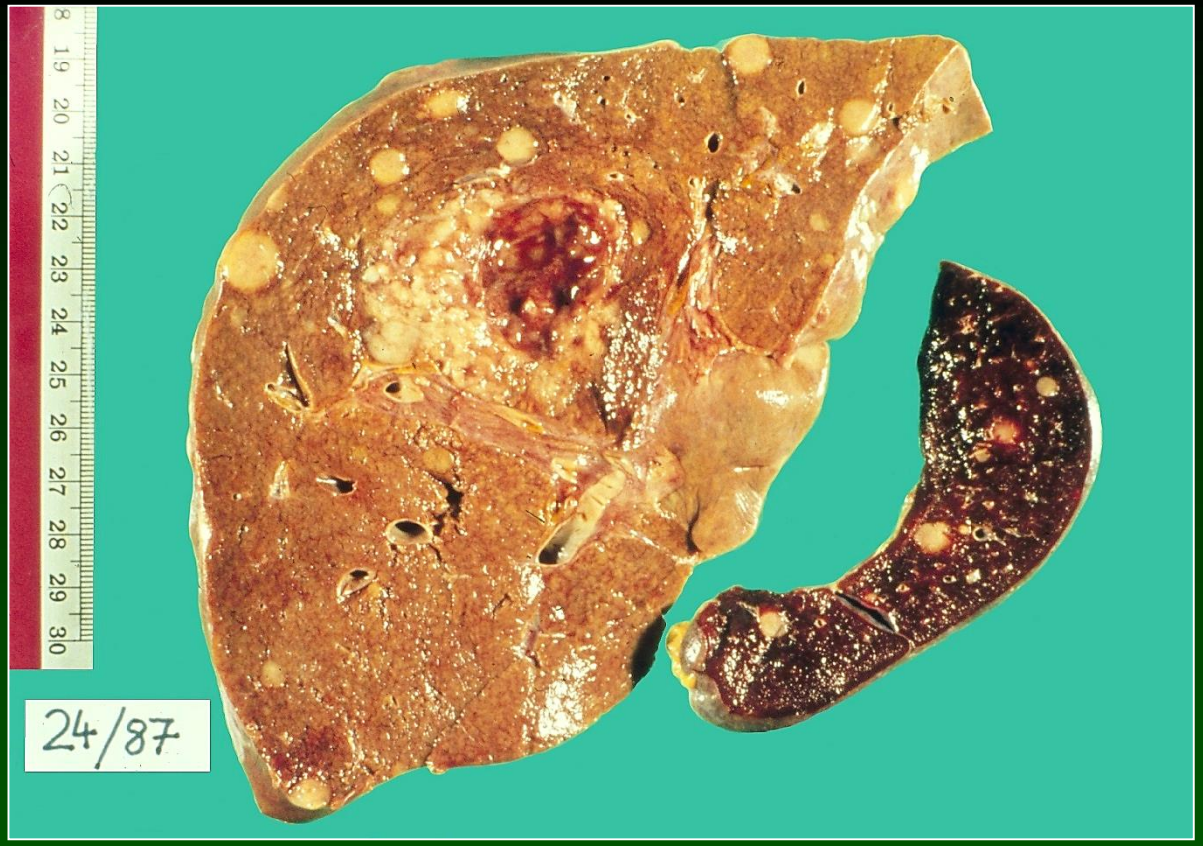
Liver metastasis

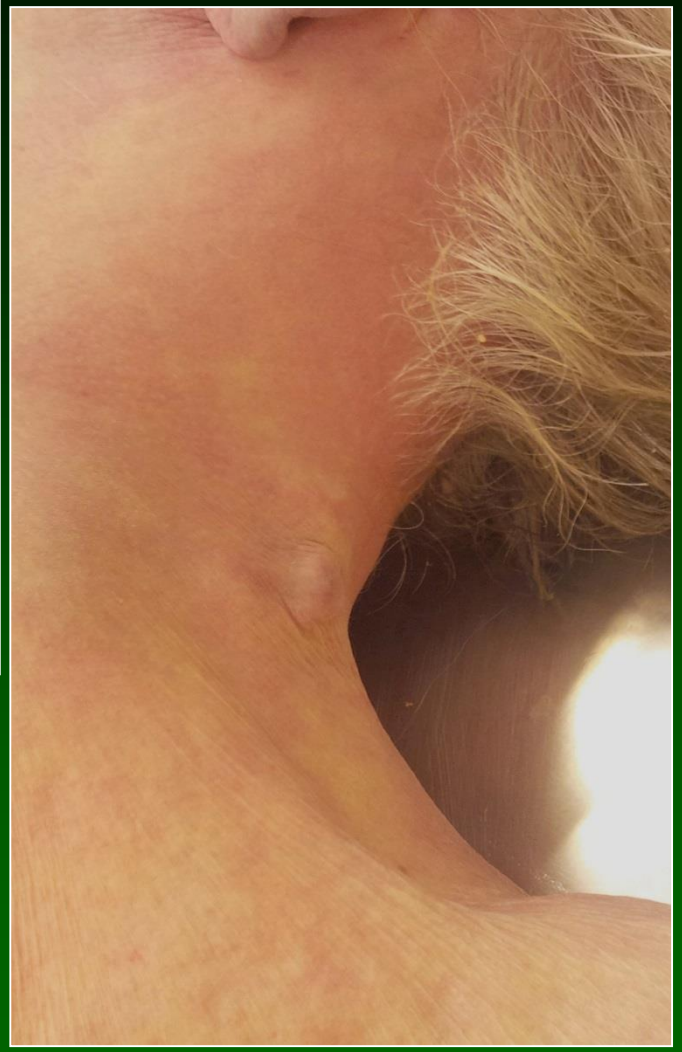
Lung metastasis

CURVOISIER-SIGN

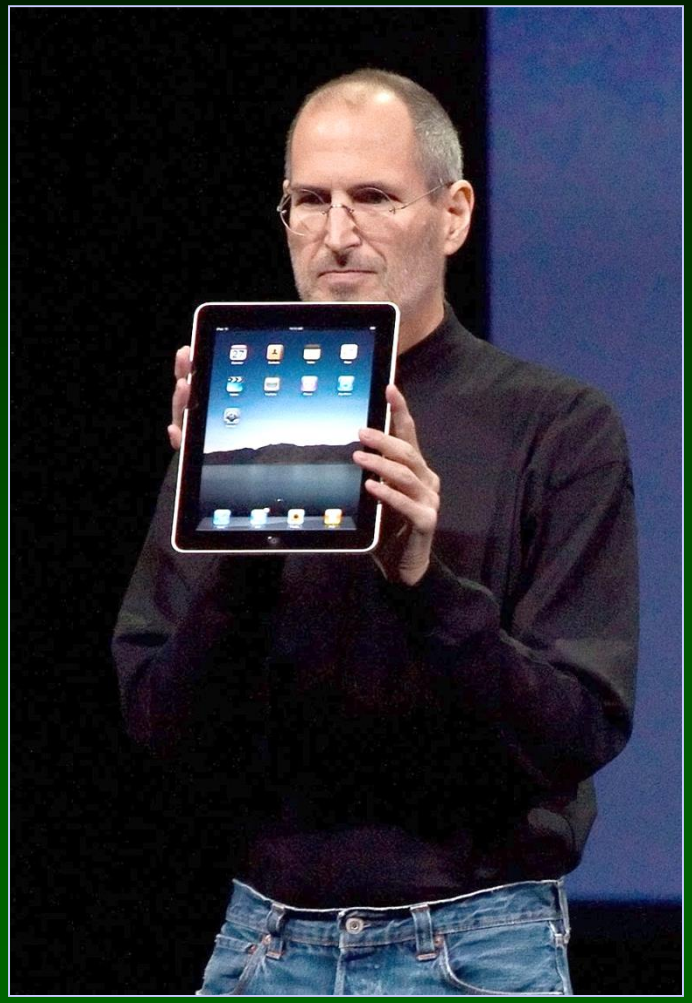





24/87



PANCREATIC NEUROENDOCRINE TUMORS



- Incidence: 0,2 – 0,3 / 100 000 / year
- In childhood: exceptional
- Slow growth
- 60-70 % hormonaly active

(special names)

Genetic background:

1) Mostly sporadic
2) Autosomal dominant diseases:

MEN-1 syndrome

Von Hippel-Lindau disease

Neurofibromatosis Type 1.

Tuberous sclerosis

PANCREATIC NEUROENDOCRINE TUMORS

„Benign - malignant”

Functioning – inactive

May be components of MEN-1 syndrome

Frequently multihormonal

Insulinoma

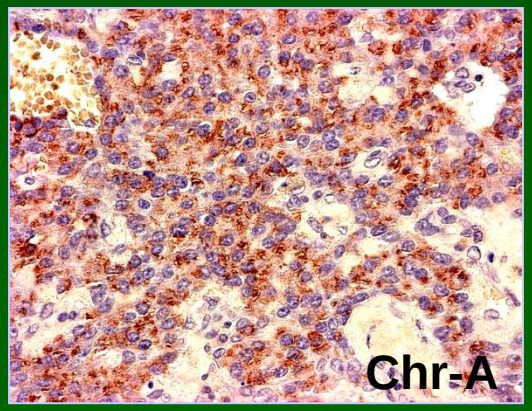
PP-cell tumor

glucagonoma

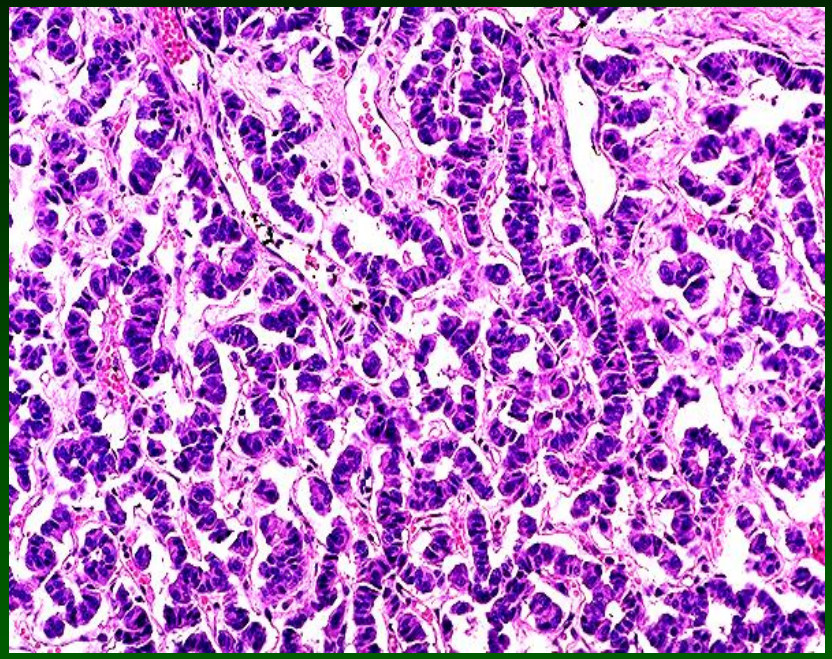
gastrinoma

somatostatinoma

VIPoma



ISLET CELL TUMORS



Histological criteria of malignancy are vague!

Reliable critéria:

size

mitotic count

angioinvasivity

Ki-67 score

- **Neuroendocrine neoplasm (G1-G2-G3)**
- **(Poorly differentiated) neuroendocrine carcinoma**

PANCREAS TRANSPLANTATION - I.

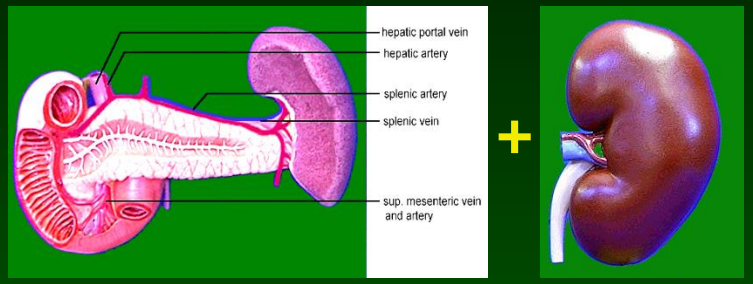
Indication:

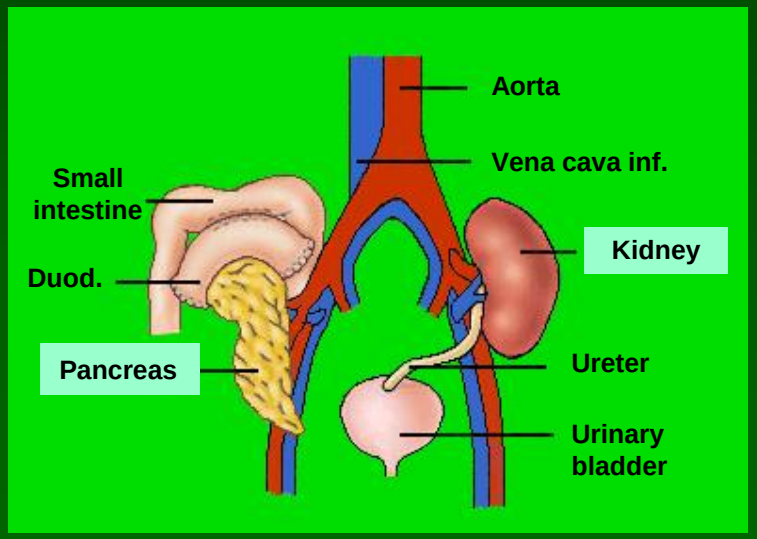
Diabetes mellitus complicated by renal insufficiency, when renal transplantation is indicated anyway.

Simultaneous pancreatic and renal transplantation

REJECTION?

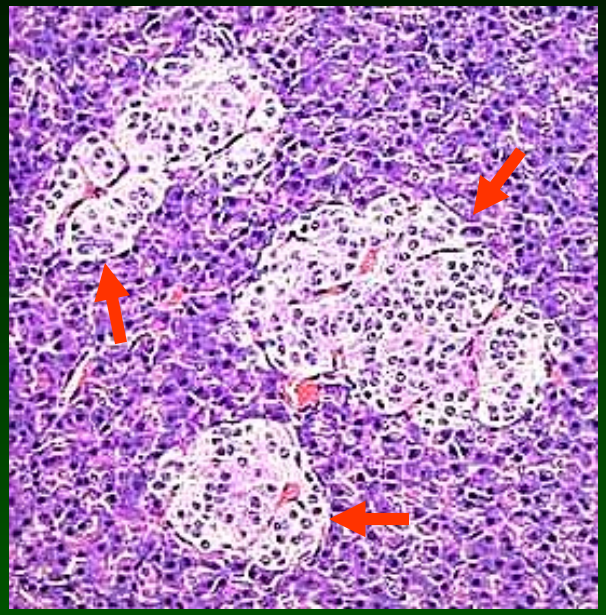
Surgical technique:

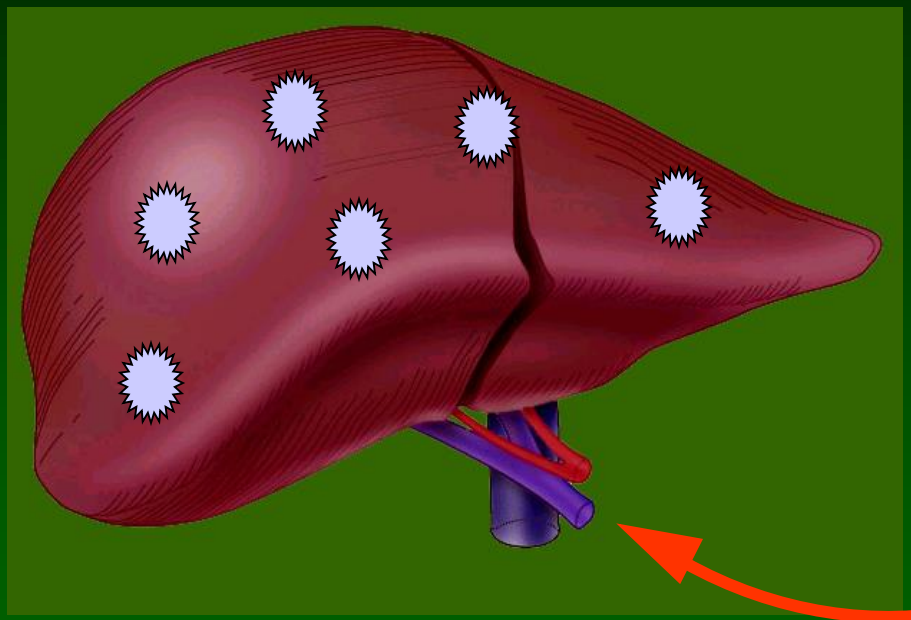




PANCREAS TRANSPLANTATION - II.

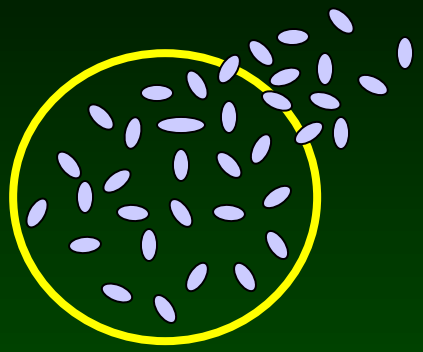
Isolated Langerhans-islands
(500 000 - 700 000/pancreas)





In embryonal pancreata Langerhans islands account for about 90% of the organ!

PANCREAS TRANSPLANTATION - III.



- immune suppression is not necessary
- collagenization

Present results:

1-year insulin-free course: 83 %

5-year insulin-free course: 50 %