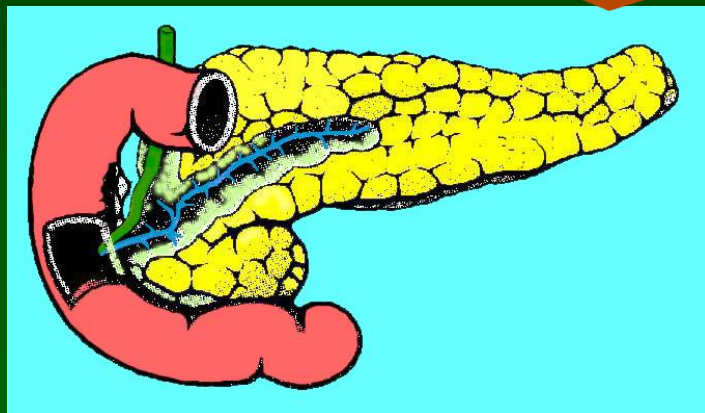




PANCREAS



Attila Zalatnai

INVOLVEMENT OF THE PANCREAS IN GENETICALLY DETERMINED DISEASES

Cystic fibrosis (mucoviscidosis)

Skin → Increased NaCl-content of the sweat

Bronchi → recurrent infections

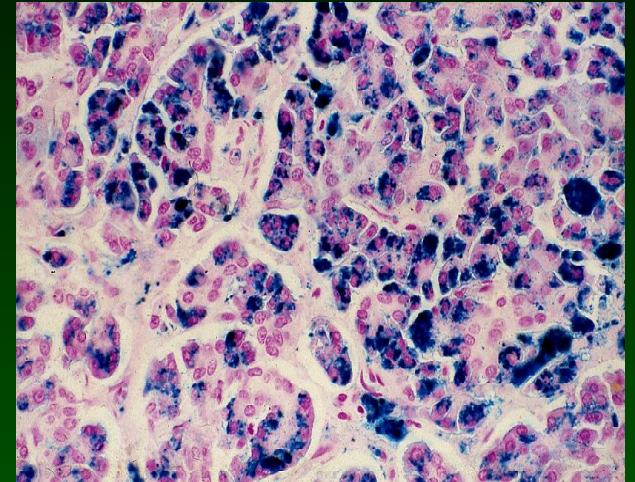
Small bowel → meconium-ileus

Pancreas → obstruction → fibrosis → pancreatic insuff.

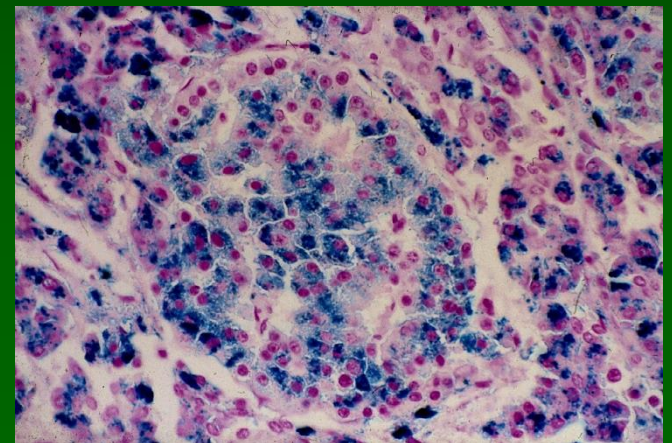
Hemochromatosis ("bronze-diabetes")

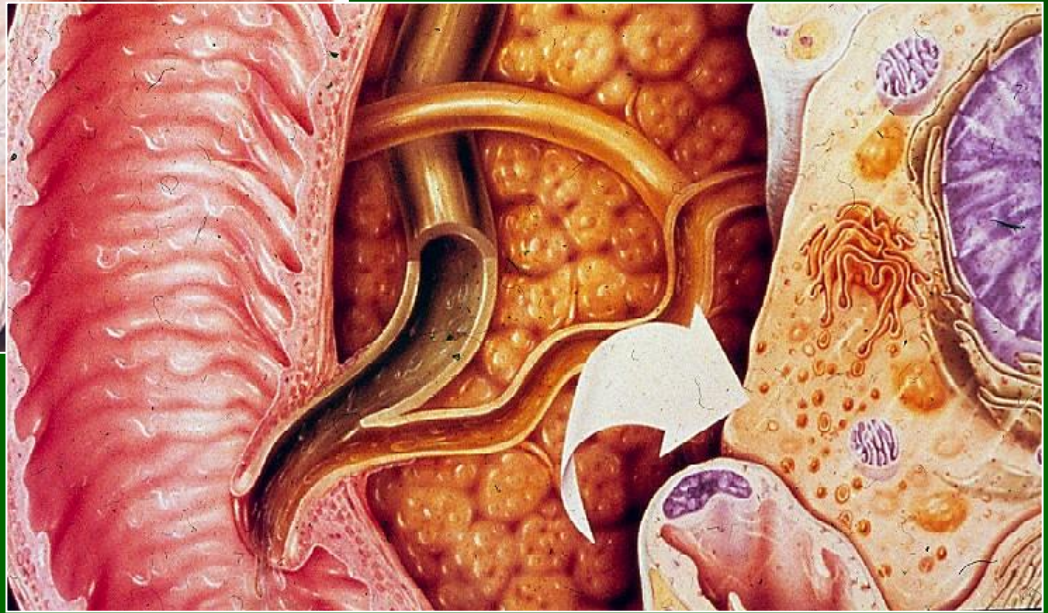
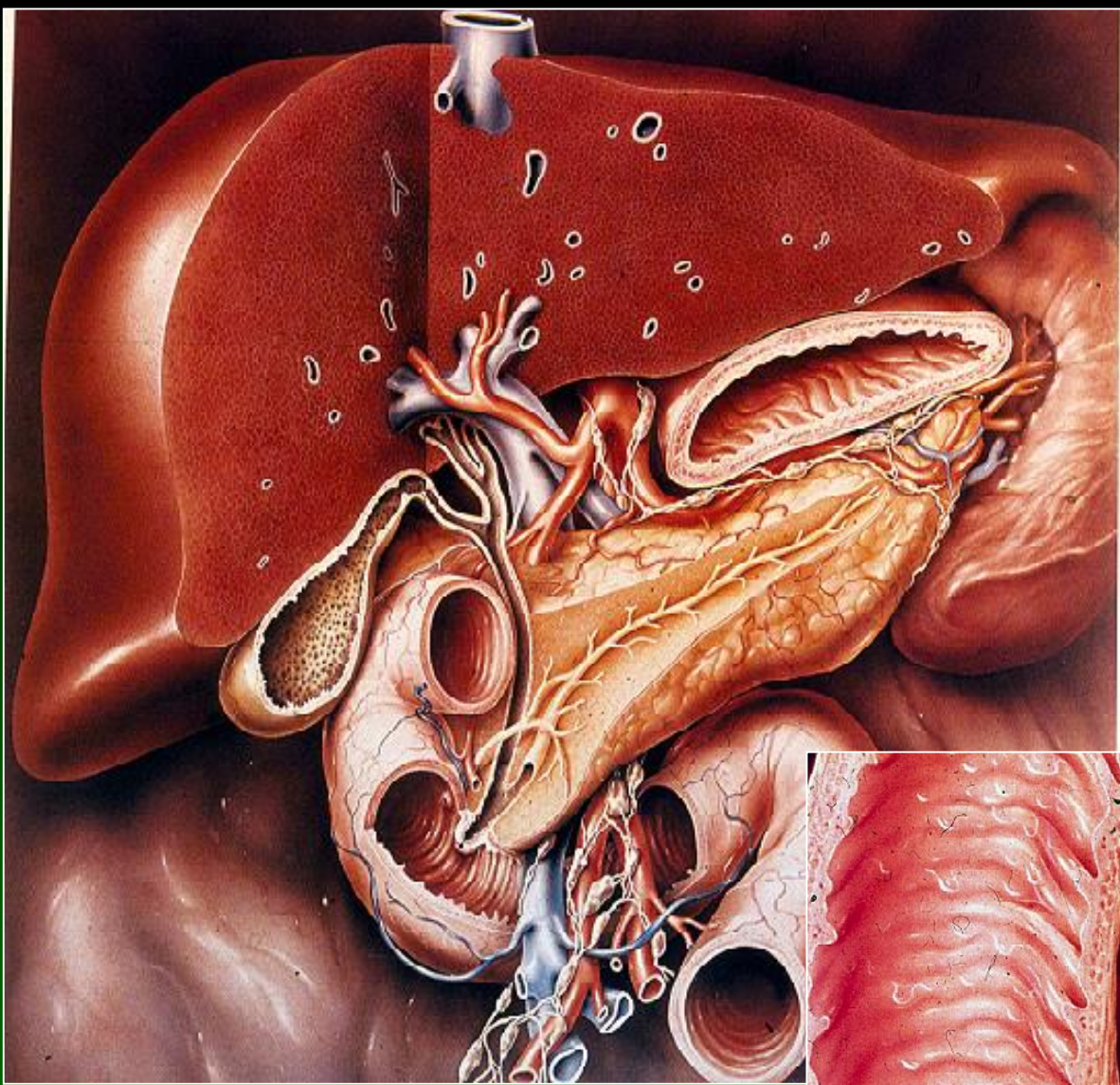
Skin, liver, pancreas, heart, testicles, hypophysis...

HEMOCHROMATOSIS

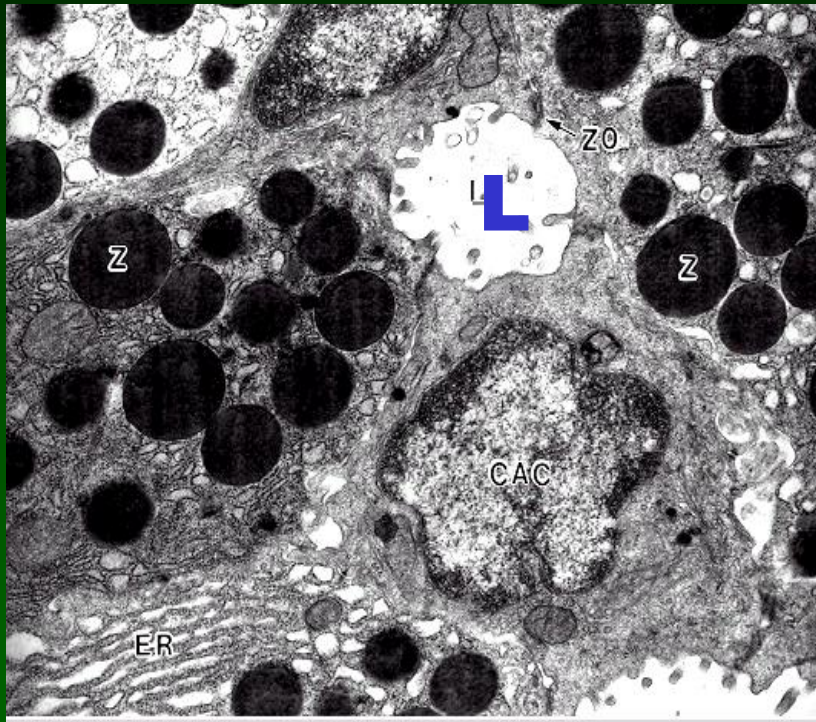


(Prussian blue)





MAIN ENZYMES OF THE PANCREAS



Trypsinogen

Chymotrypsinogen

Proelastase 1, 2

Procarboxypeptidase

A1-A2, B1-B2

Phospholipase

Lipase

Amylase

Non spec. carboxylesterase

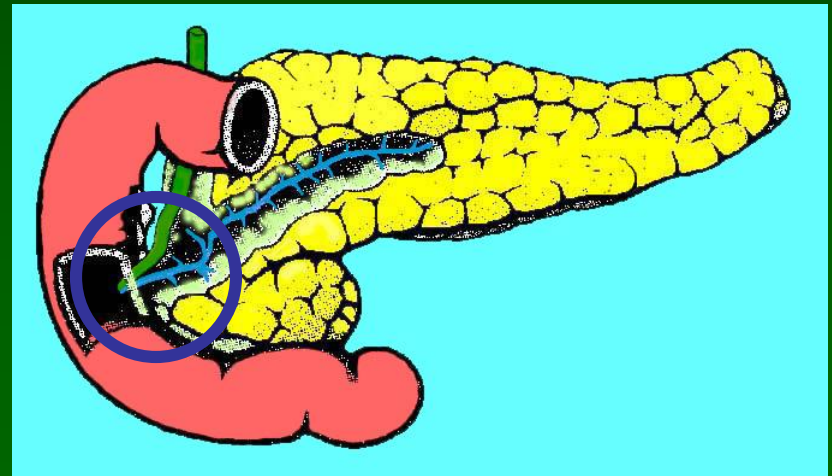
RNase

DNase

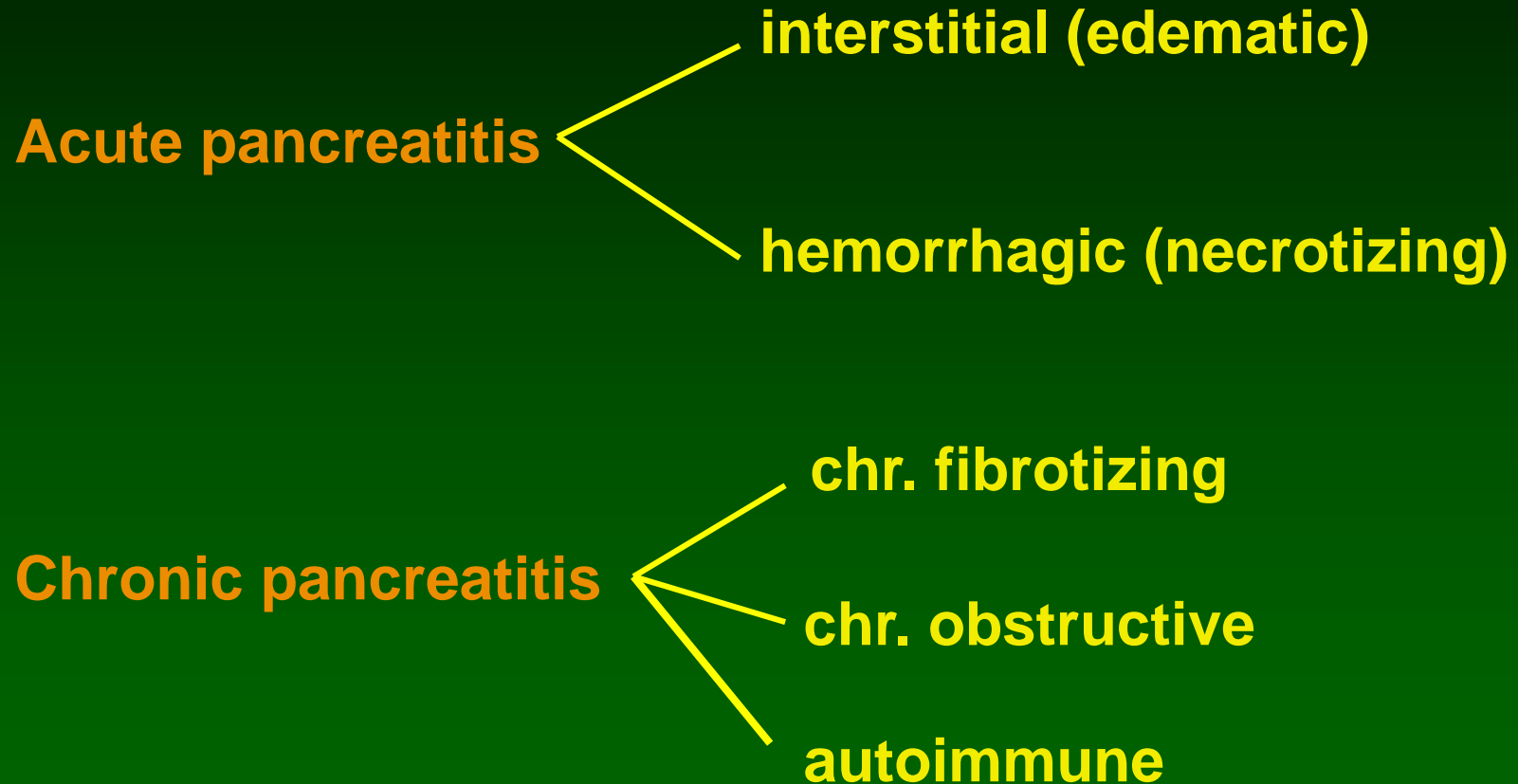
.....

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



CHARACTERISTICS OF THE ACUTE PANCREATITIS FORMS

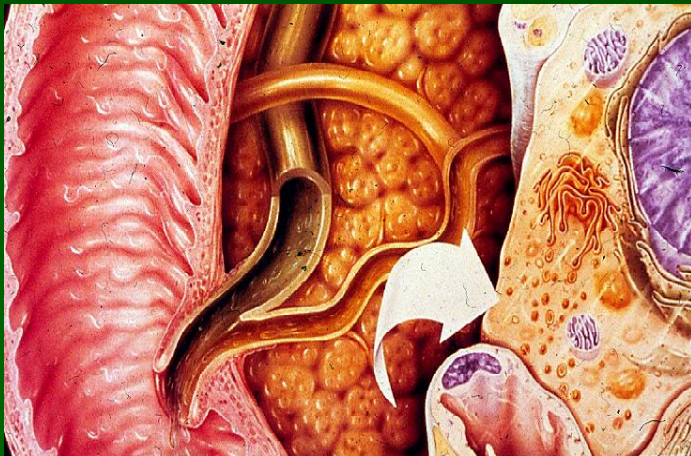
	Frequency	Lethality (%)
Interstitial (edematic)	80 - 90 %	0,3 %
Hemorrhagic (necrotizing)	10 - 15 %	50 - 90 %

ETIOLOGICAL FACTORS IN THE DEVELOPMENT OF ACUTE PANCREATITIS

40 - 50 %: cholelithiasis

30 - 40 %: alcoholism

10 - 30 %: idiopathic



Other causes:

Trauma (surgery!)

Hypercalcemia

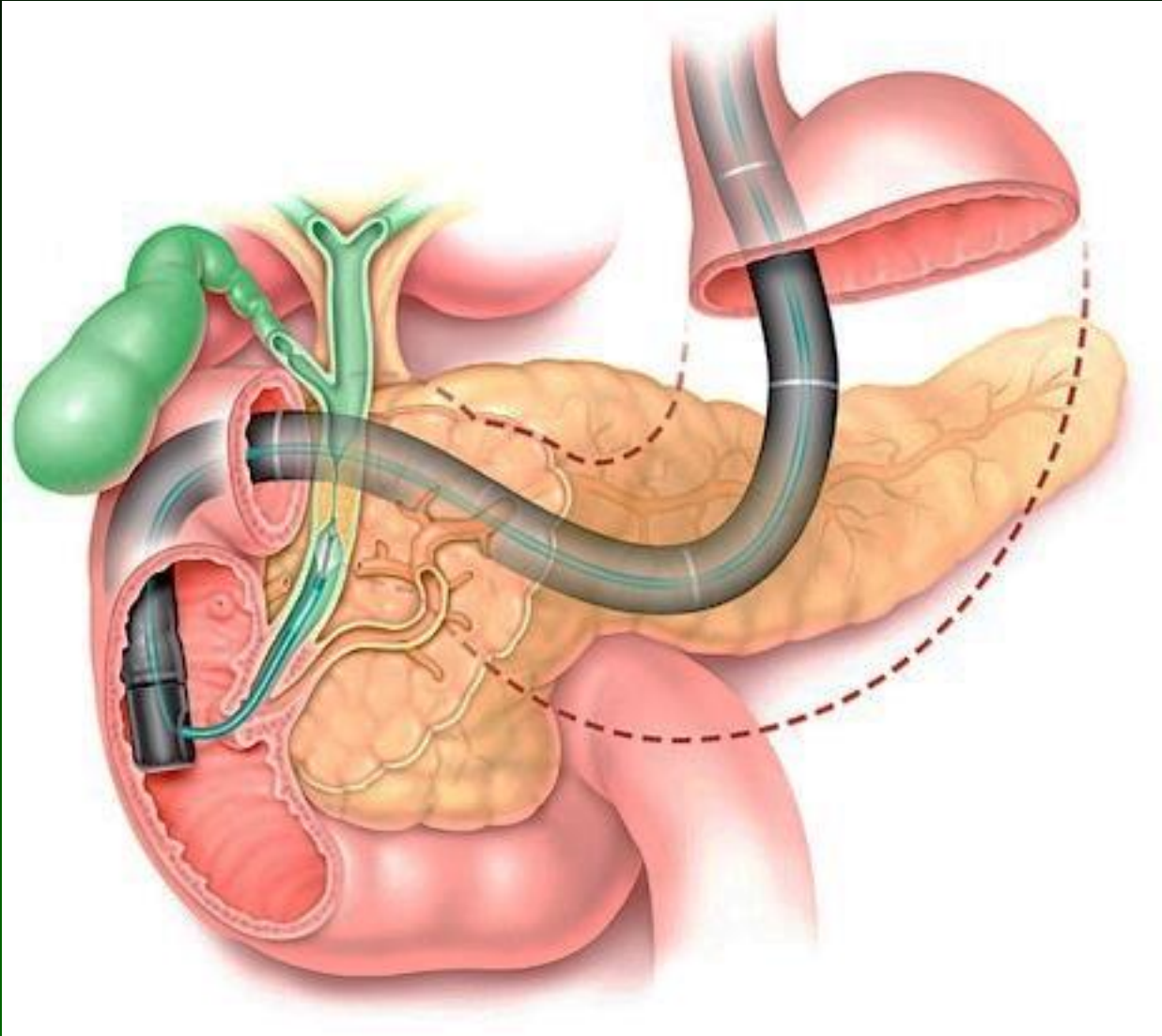
Hyperlipoproteinemia

Vater-papilla obstruction

Infections (viruses)

Iatrogenic (ERCP, lithotripsy)

Familial



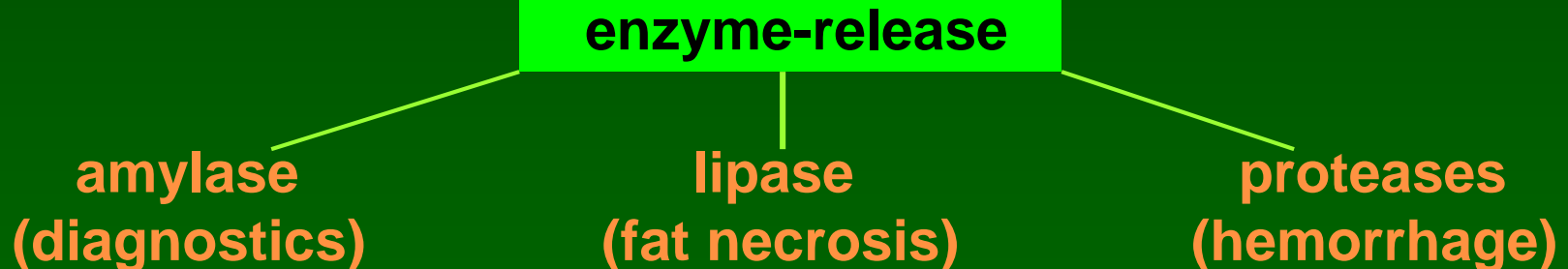
PATHOMECHANISM OF THE ACUTE PANCREATITIS

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:

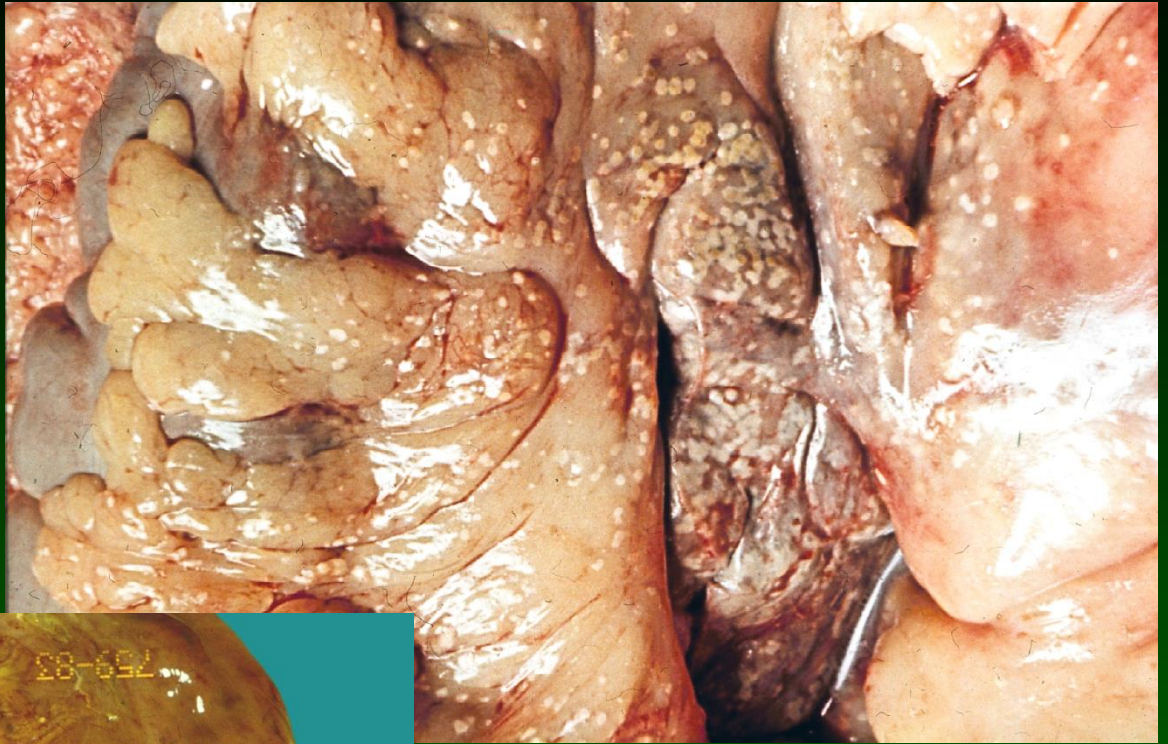
- recovery
 - fat necrosis
 - pseudocyst
- ↓
- abscess, ascites
 - fistule
 - pancreatic apoplexia



- retroperit. hemorrhage
- digestion of the surrounding organs

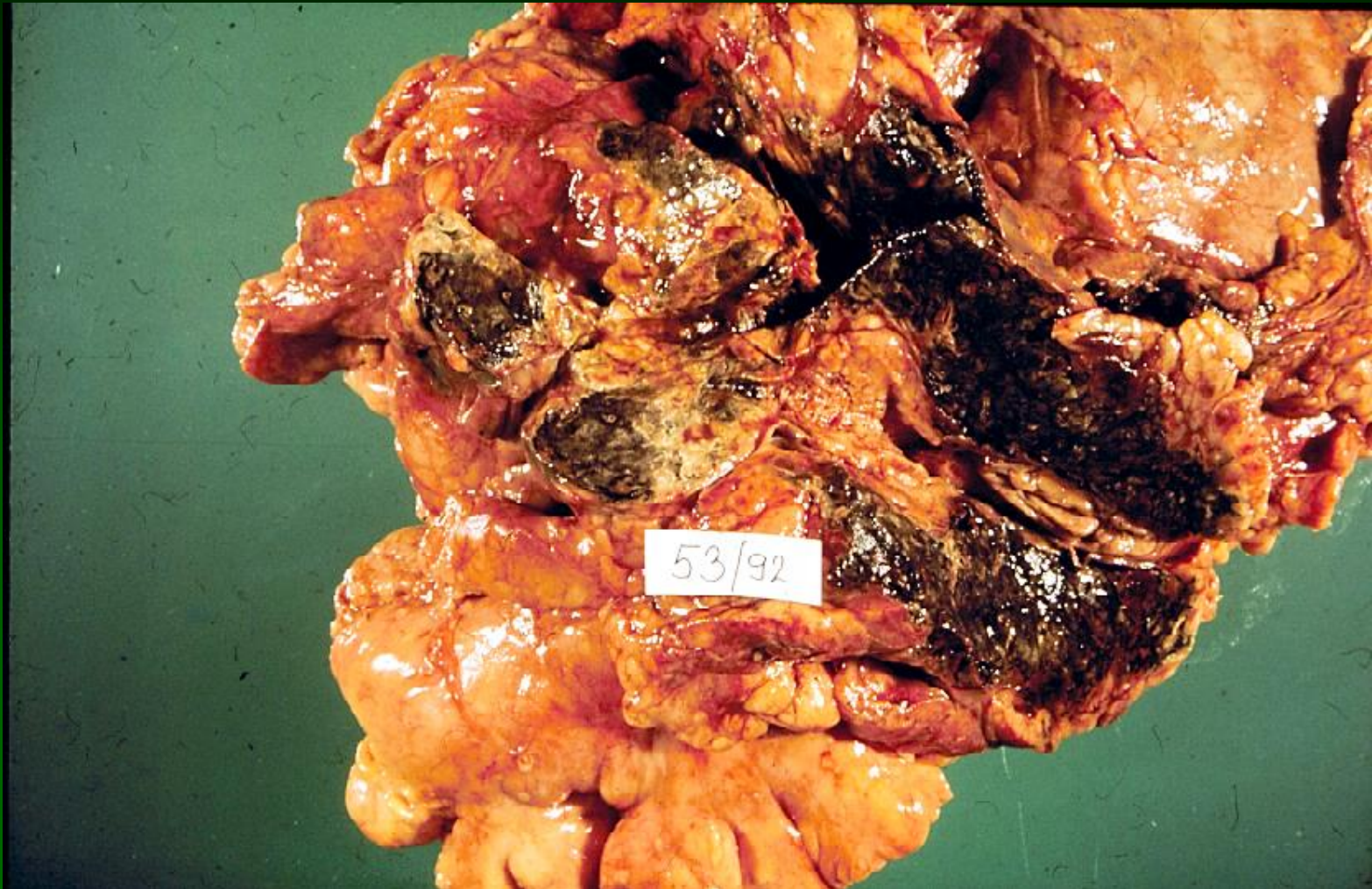
Systemic:

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

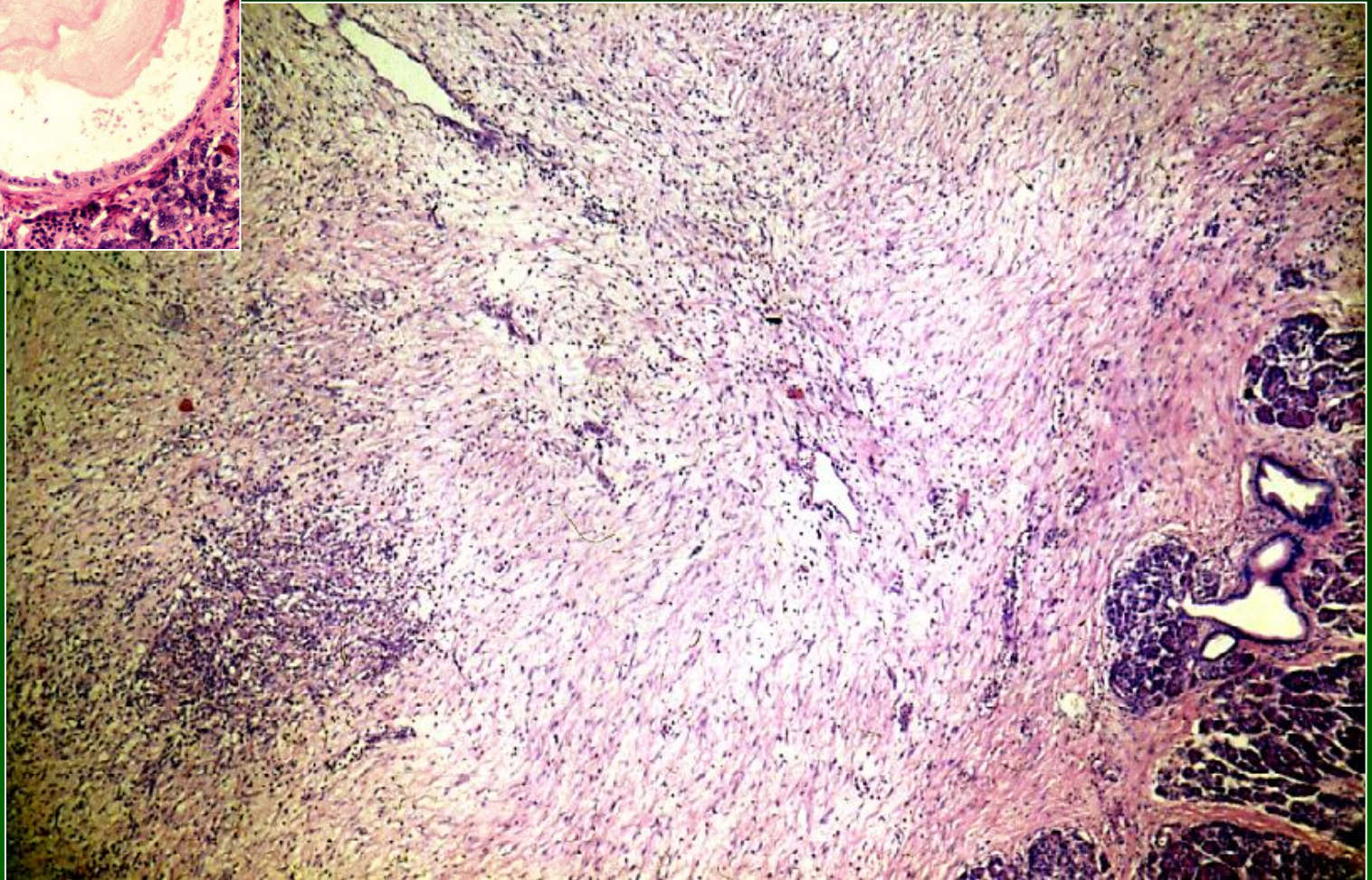
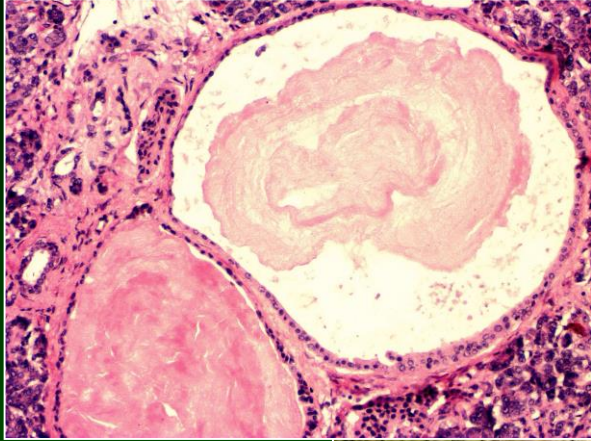




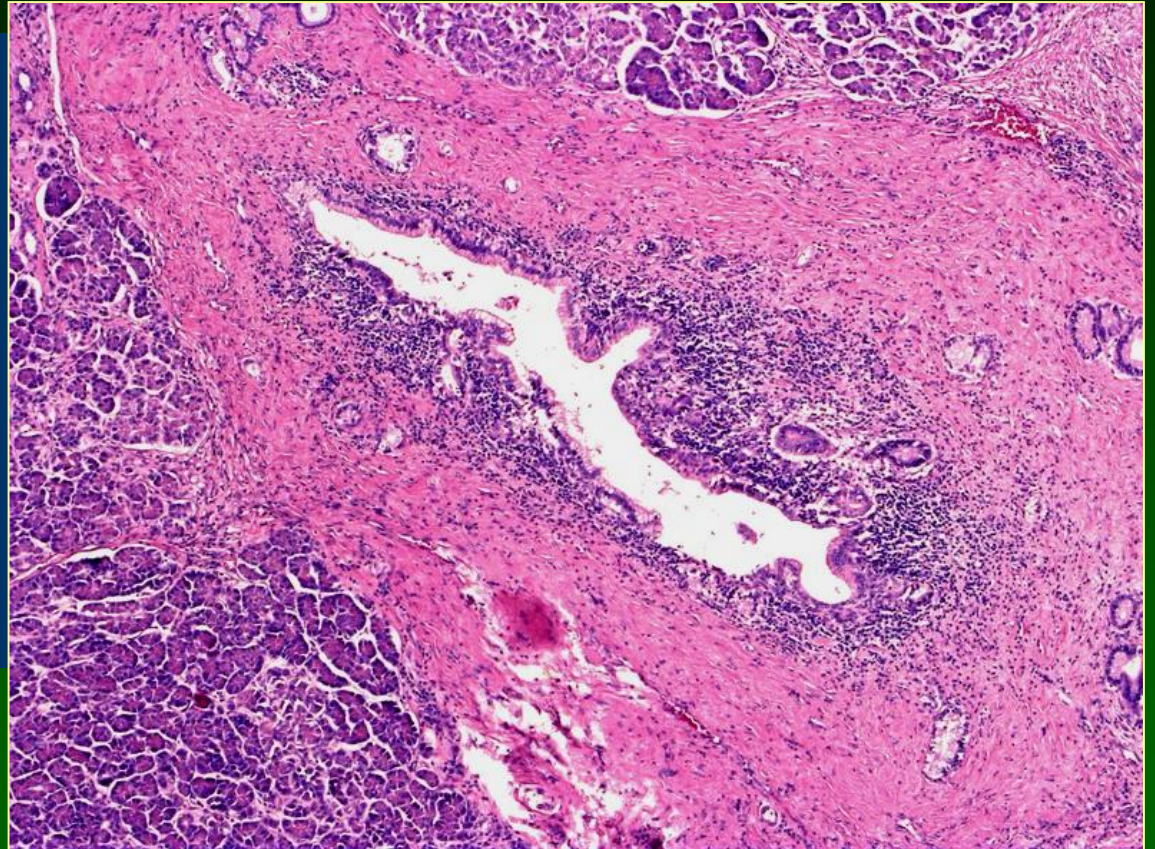
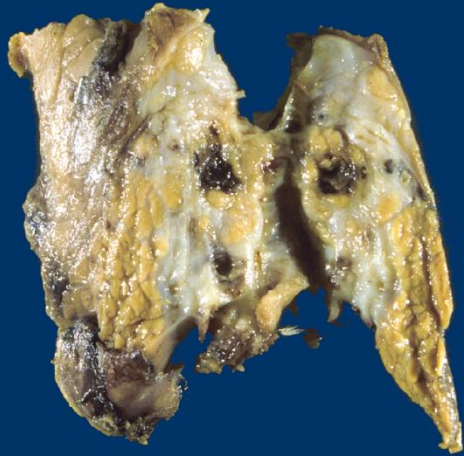
Hemorrhagic pancreatitis (pancreatic apoplexia)



CHRONIC FIBROTIZING PANCREATITIS



AUTOIMMUNE PANCREATITIS



PANCREAS EXOCRINE NEOPLASMS

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

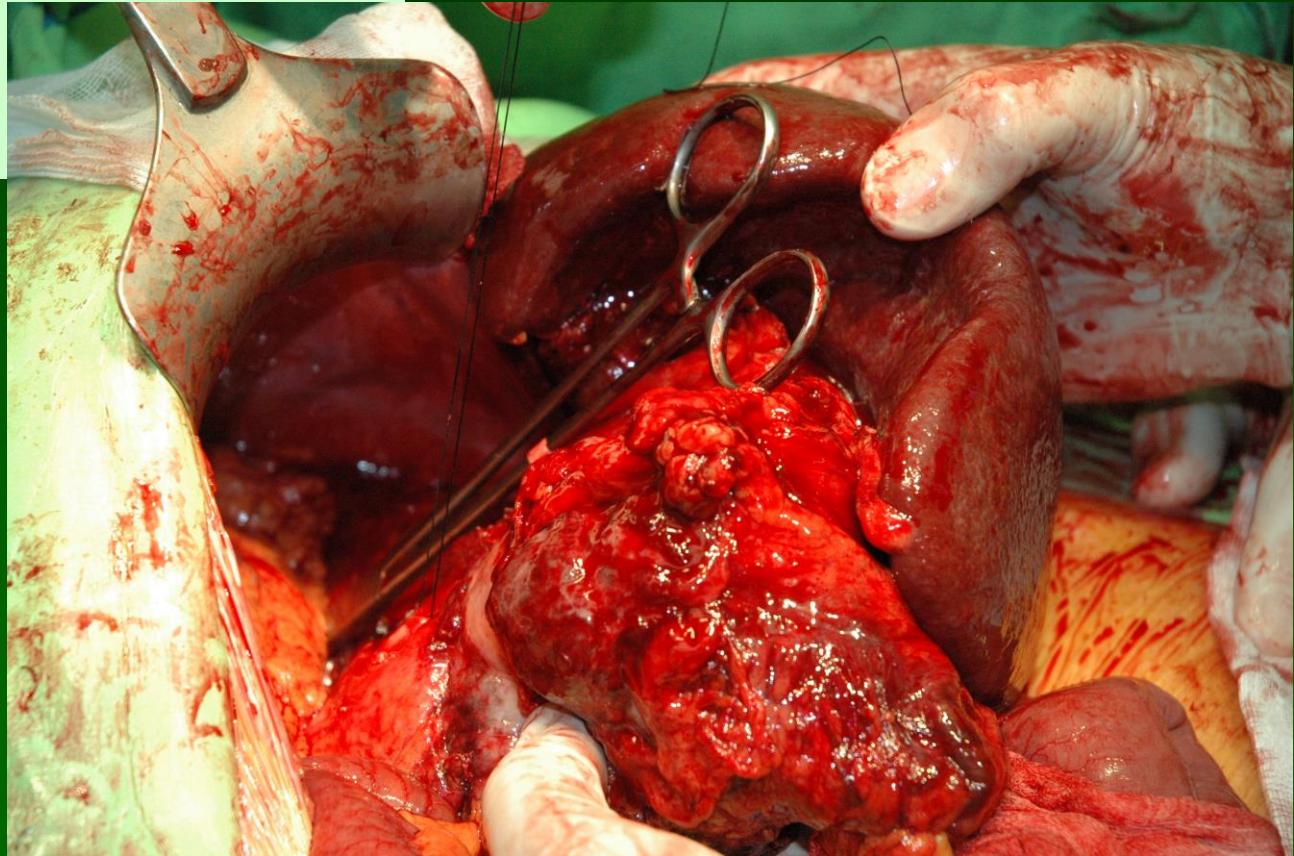
Intraductal papillary-mucinous neoplasia (IPMN)

solid-pseudopapillary neoplasia

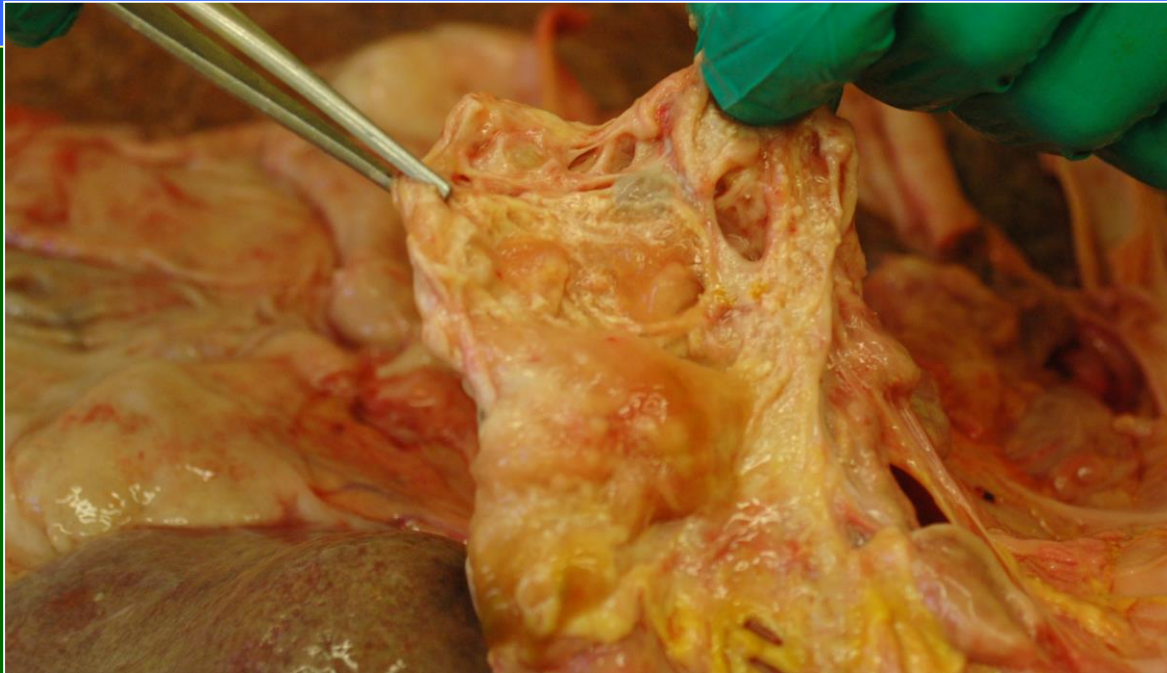
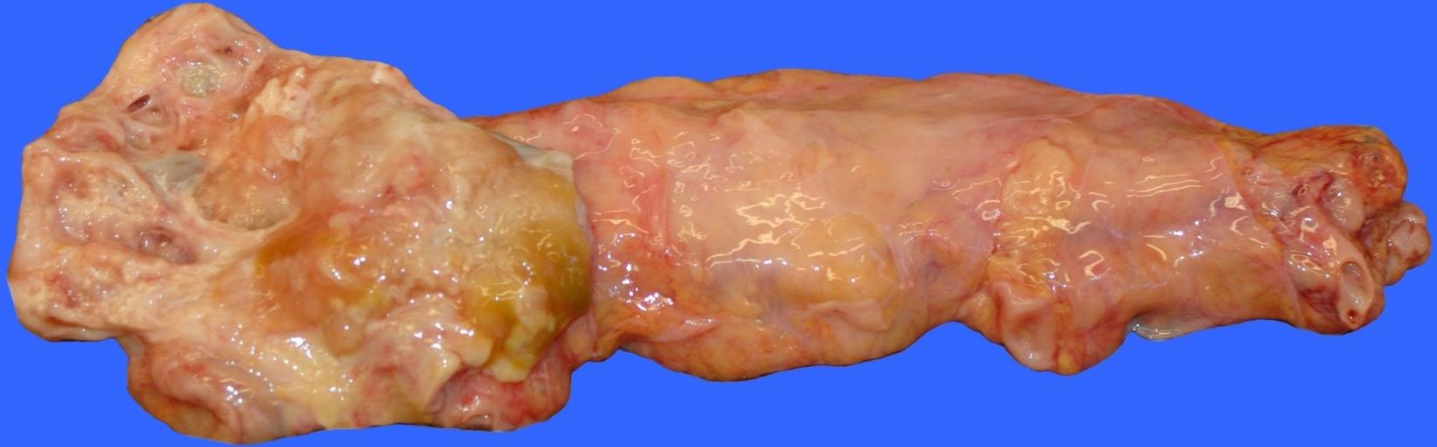
DUCTAL ADENOCARCINOMA

acinar cell carcinoma

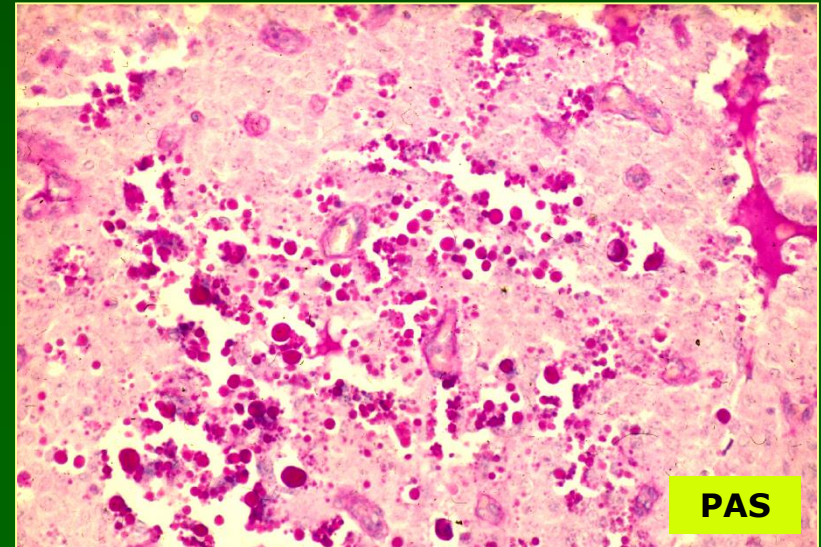
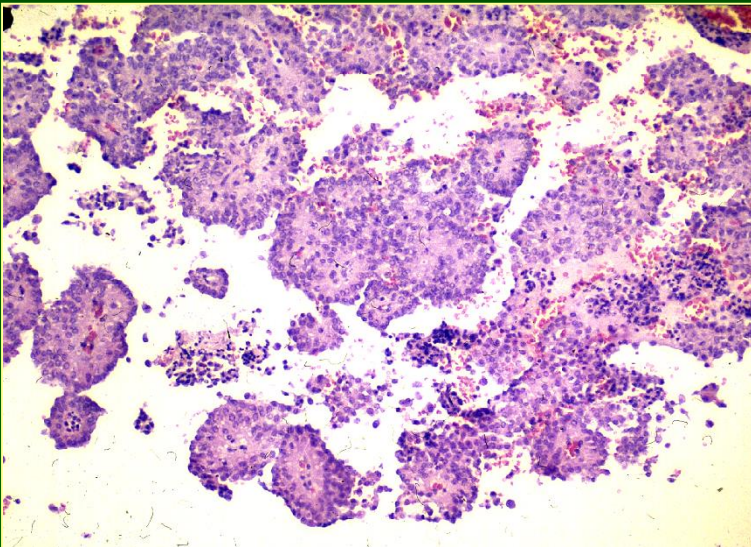
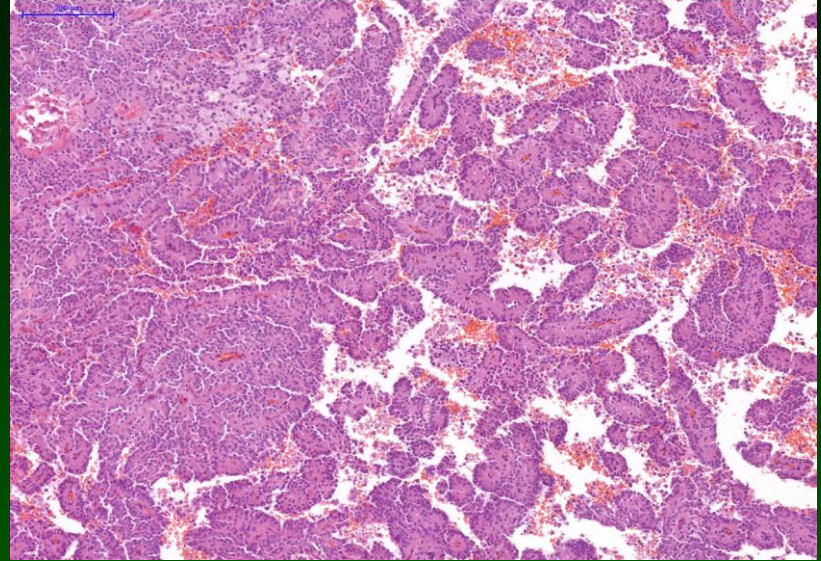
pancreatoblastoma



IPMN

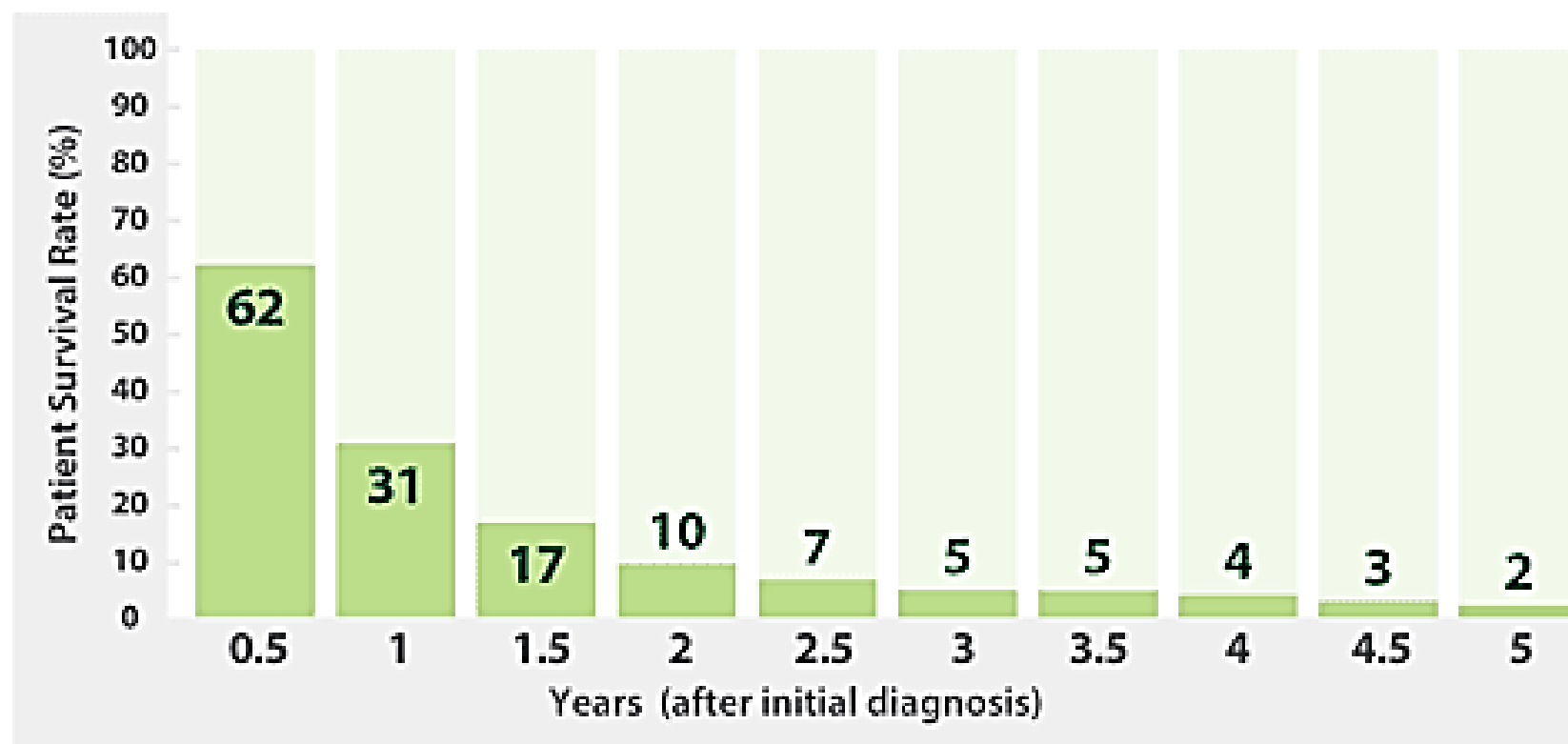


SOLID-PSEUDOPAPILLARY NEOPLASM



Pancreatic Cancer Survival Rate

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

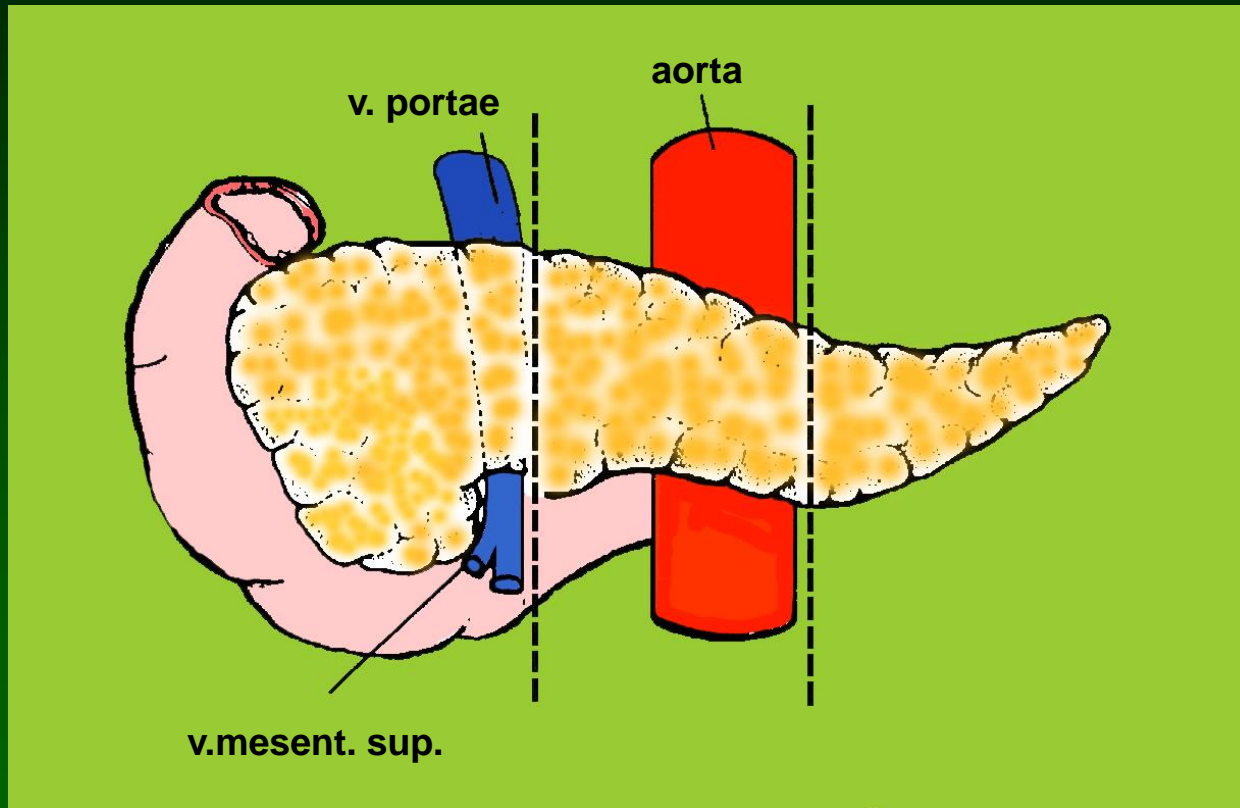


TOPOGRAPHY OF THE PANCREATIC CANCER

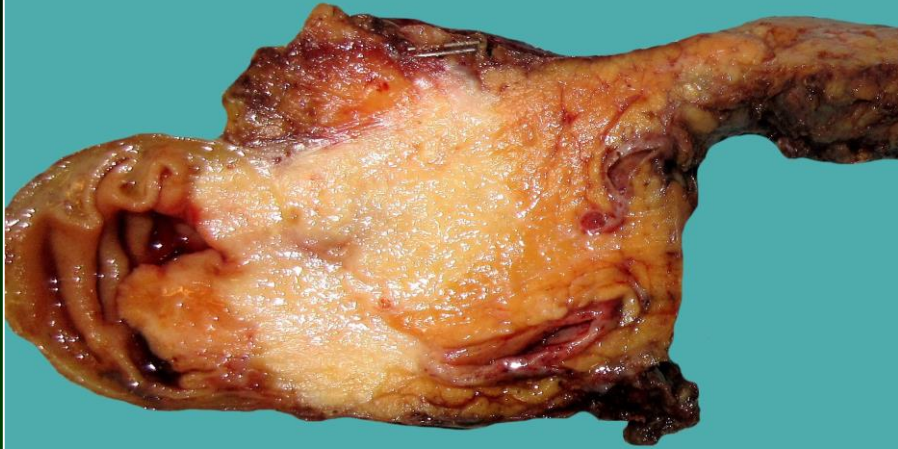
70 %

15 %

15 %

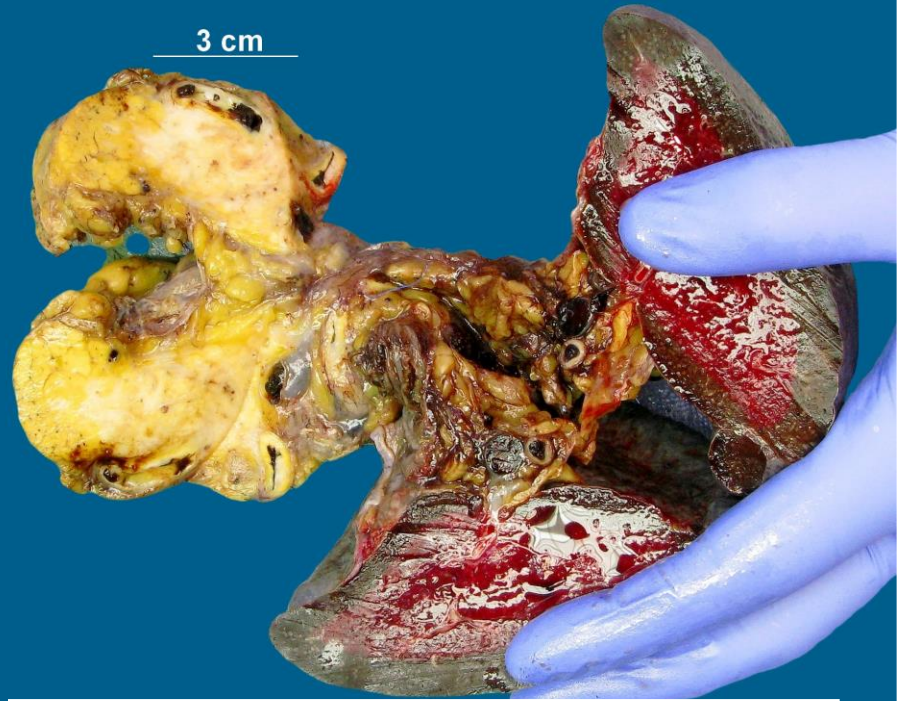


1221/19.



4,5 cm

3 cm

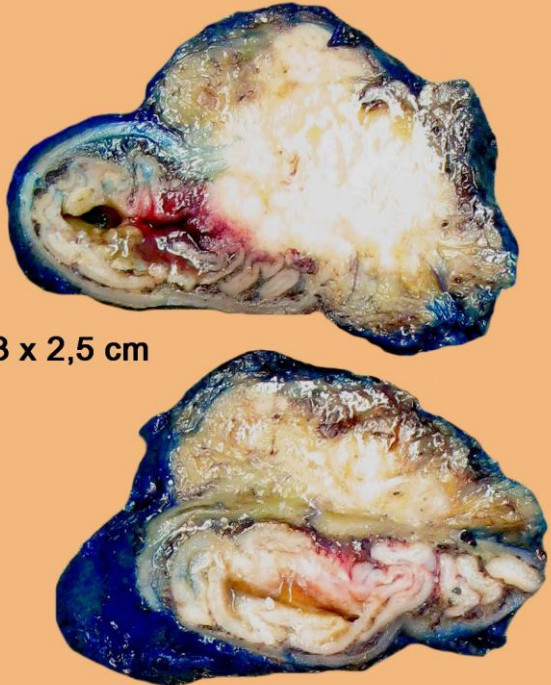


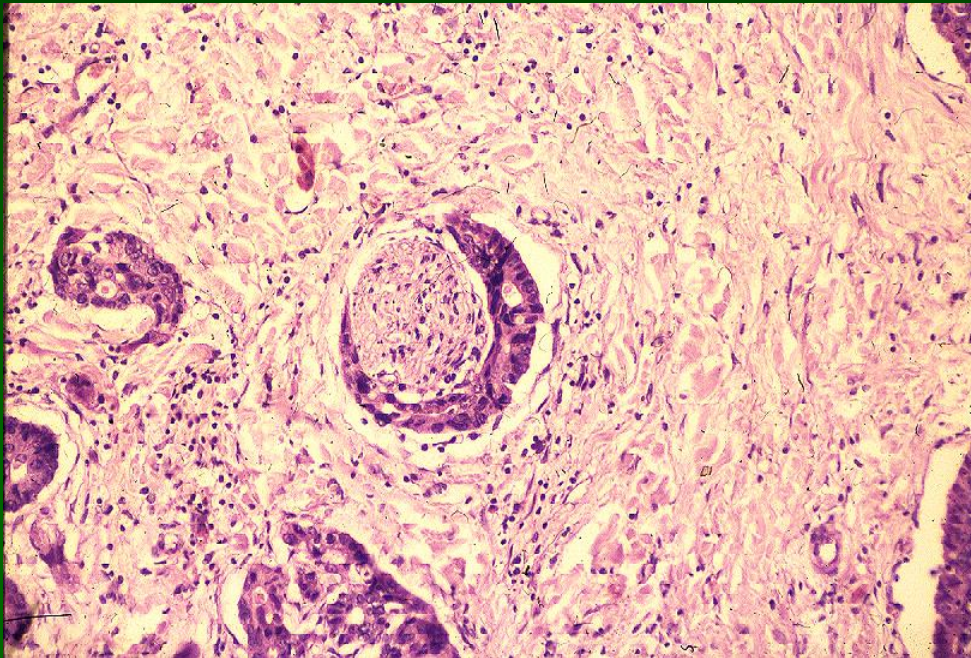
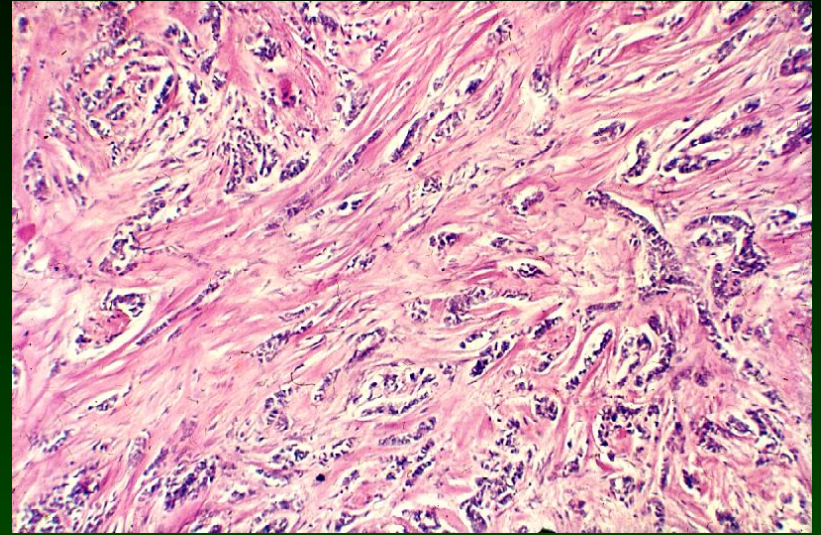
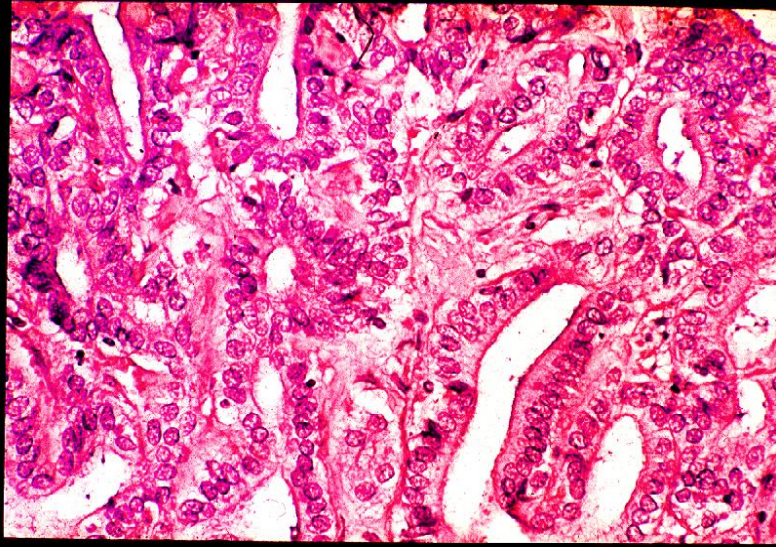
363/2020.



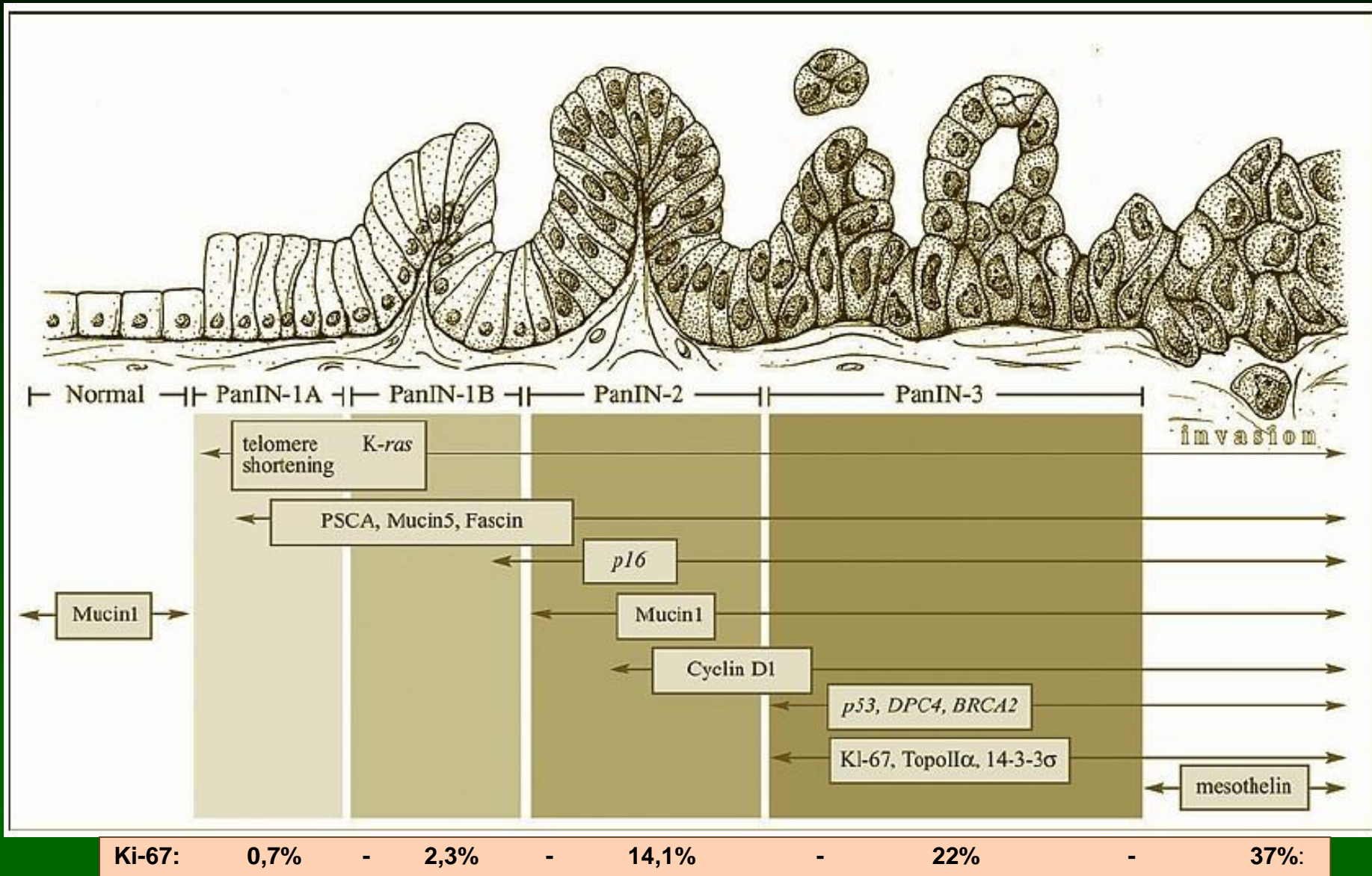
4 cm

3,5 x 3 x 2,5 cm





PANCREATIC CANCER - NATURAL HISTORY



COMPLICATIONS OF THE PANCREATIC CANCER

	<u>HEAD</u>	<u>BODY</u>	<u>TAIL</u>
Obstructive icterus	+++	(±)	(±)
Courvoisier-sign	+++	-	-

Trousseau-sign

Virchow's node

Peritoneal carcinosis

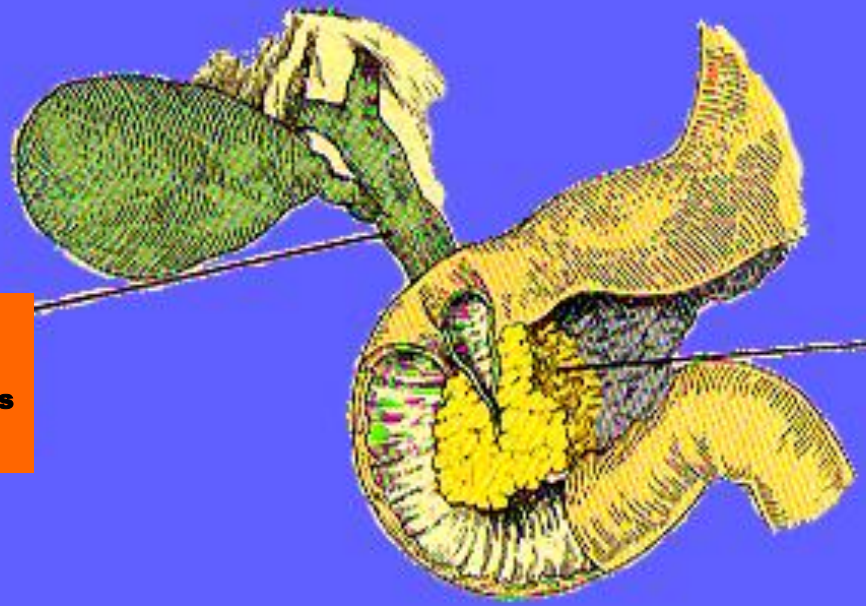
Liver metastasis

Lung metastasis

CURVOISIER-SIGN

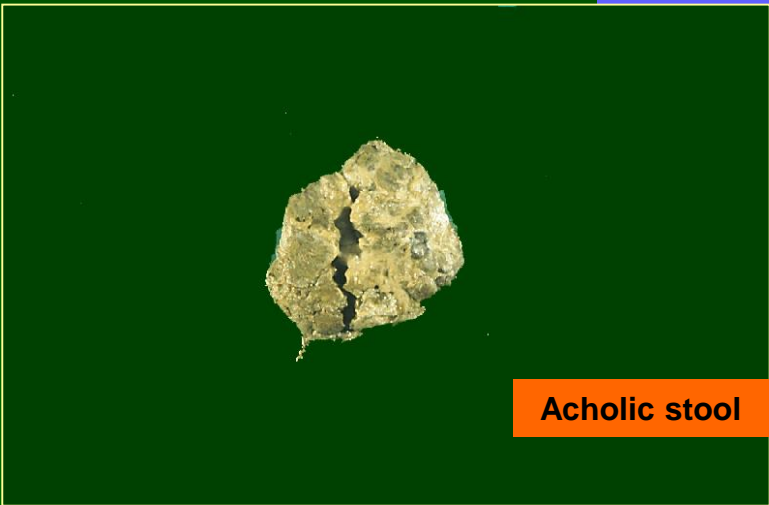


icterus



Dilated
choledochus

carcinoma



Acholic stool

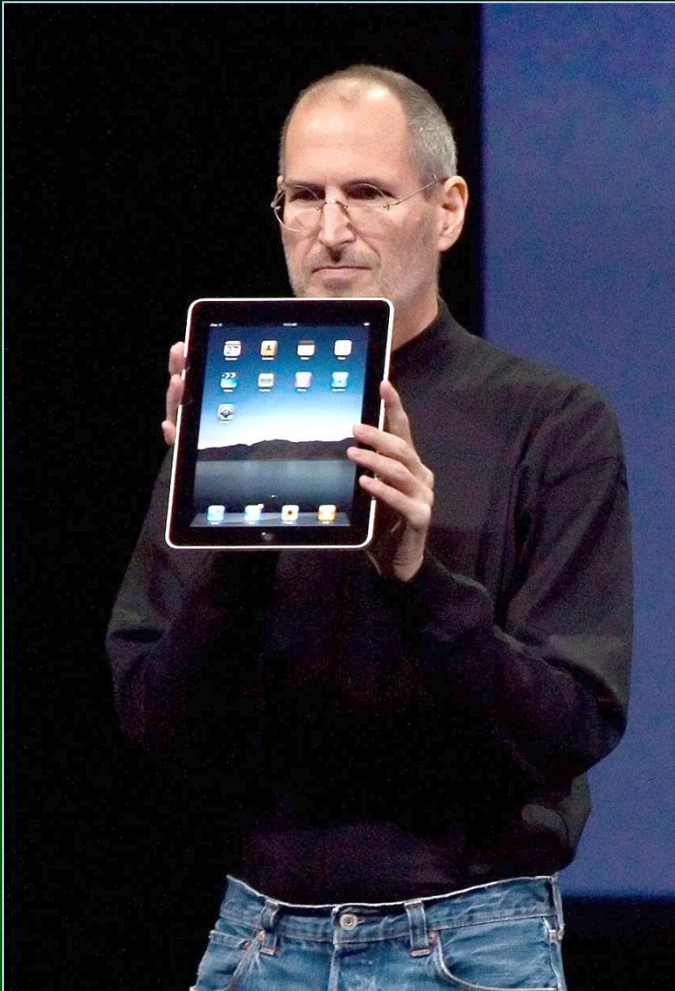


PANCREATIC NEUROENDOCRINE TUMORS

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

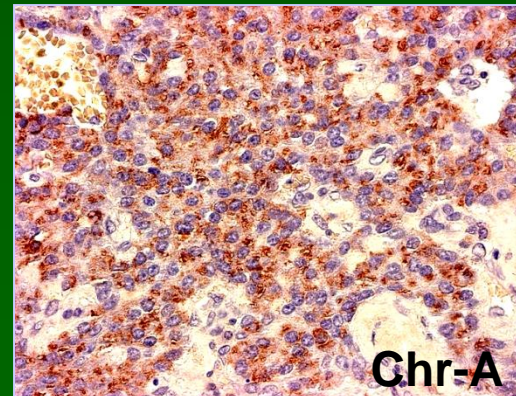


glucagonoma

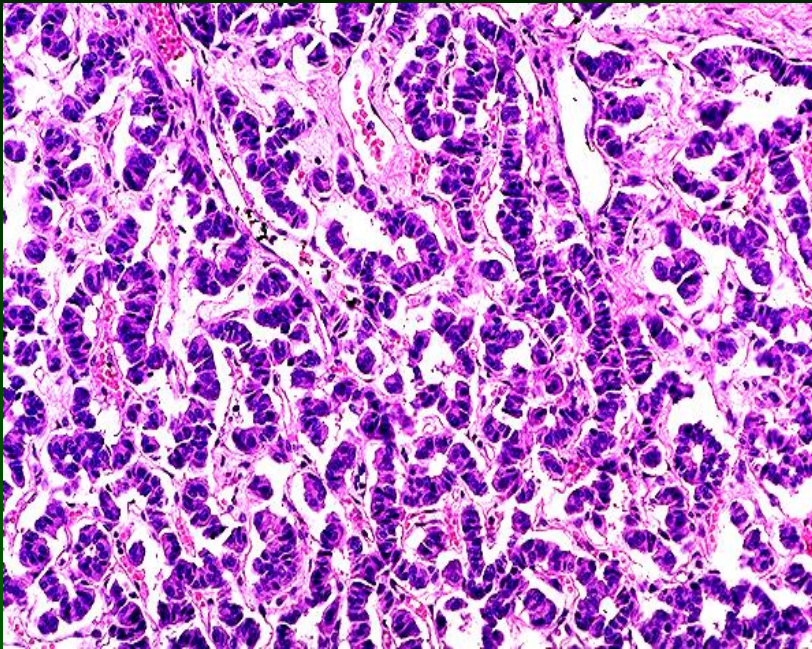
gastrinoma

somatostatinoma

VIPoma



ISLET CELL TUMORS



Histological criteria of malignancy are vague!

Reliable criteria:

size

mitotic count

angioinvasivity

Ki-67 score

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

PANCREAS TRANSPLANTATION - I.

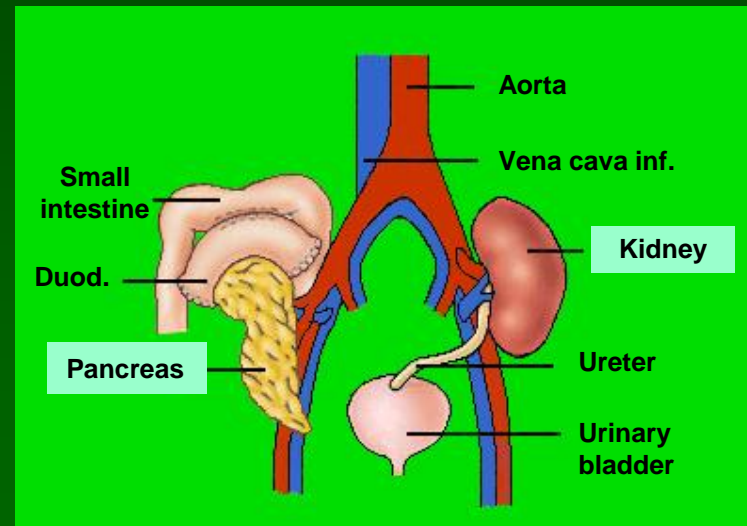
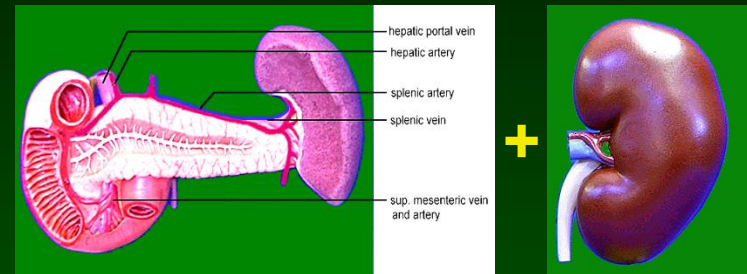
Indication:

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

Simultaneous pancreatic and renal transplantation

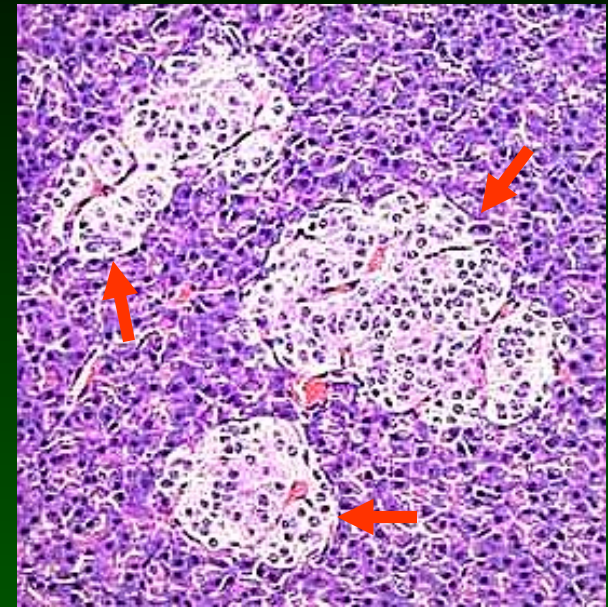
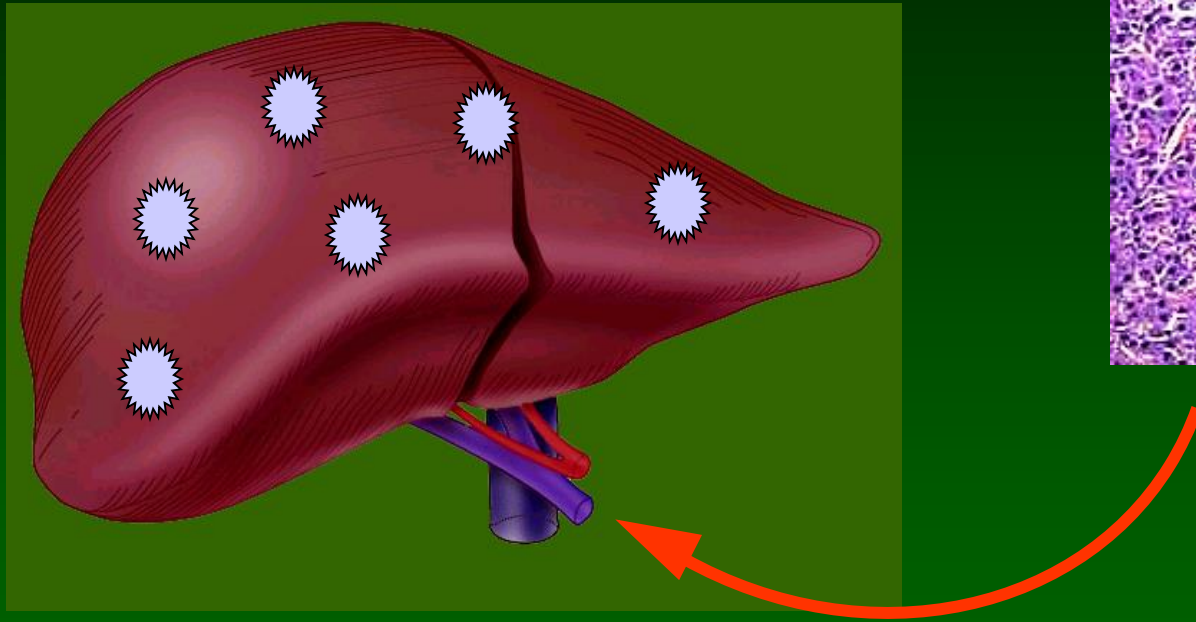
REJECTION?

Surgical technique:



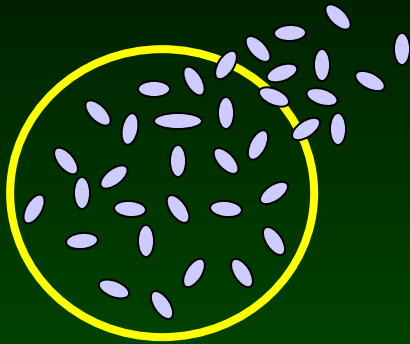
PANCREAS TRANSPLANTATION - II.

**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 %