

Surgery of the pancreas and spleen

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Hospital Brno

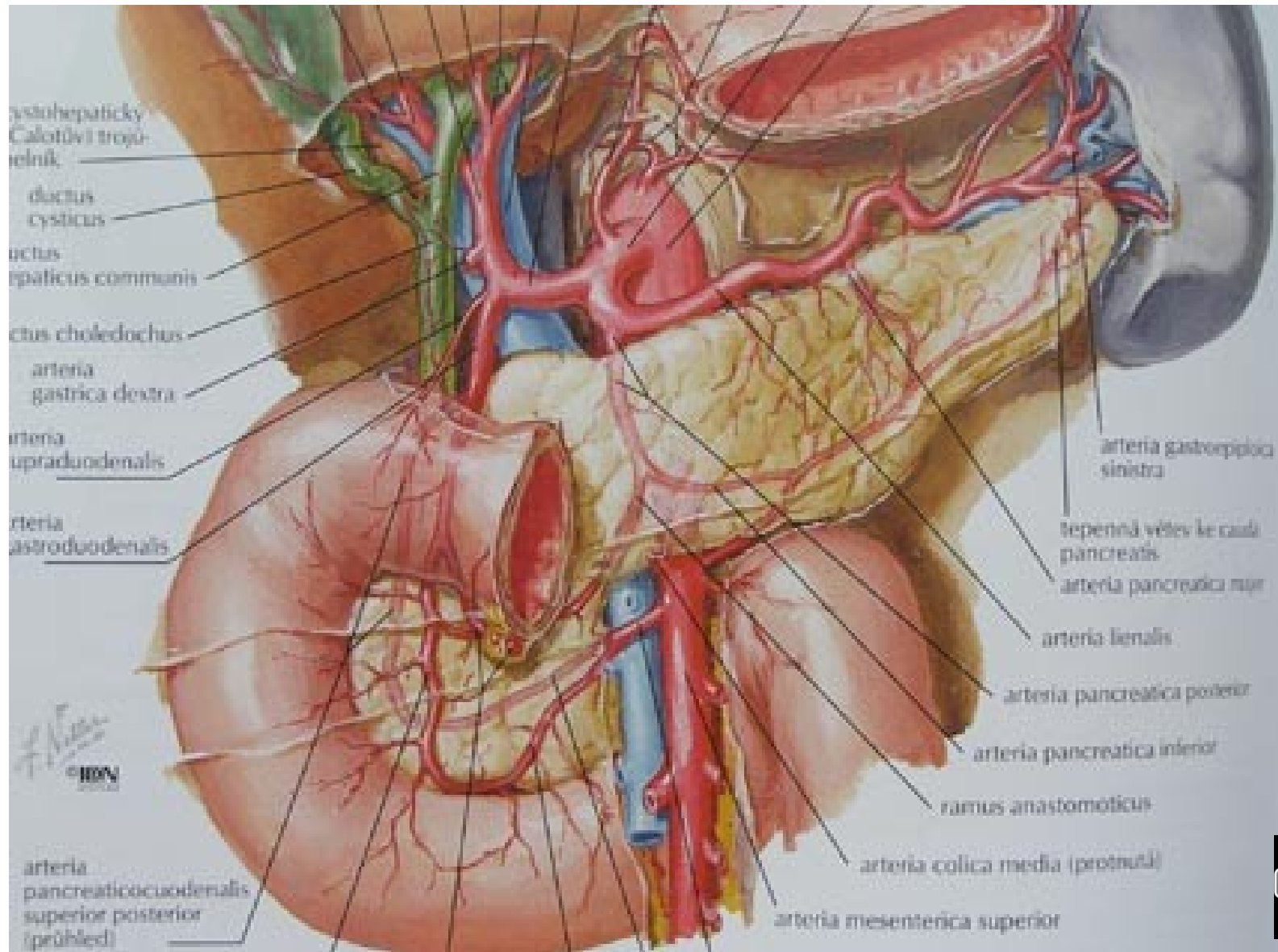


Summary

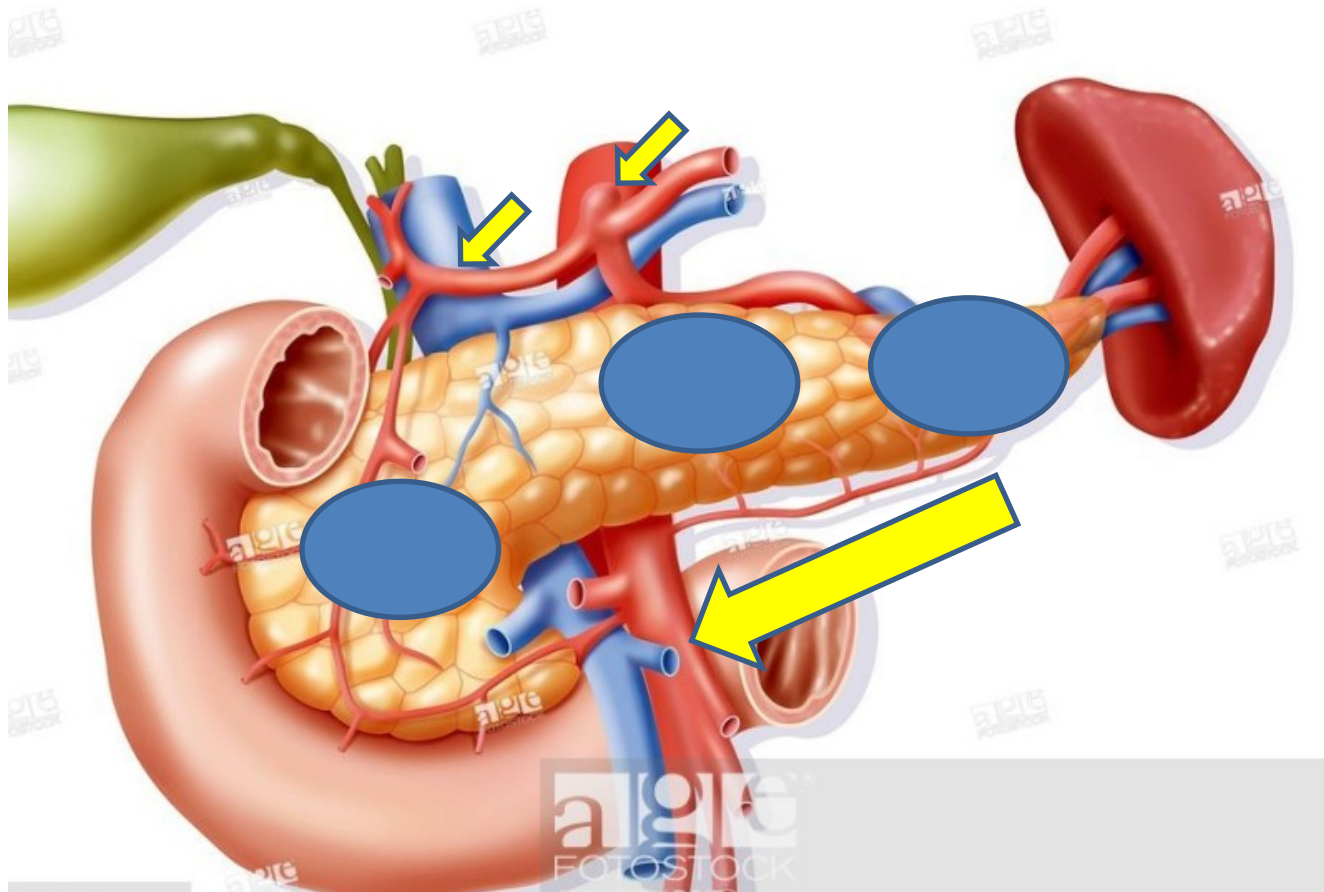
- Surgical anatomy
- Surgical physiology
- Imaging methods
- Surgical procedures
- Acute pancreatitis
- Pancreatic cancer
- Chronic pancreatitis
- Pancreatic cystic tumors
- Pancreatic neuroendocrine neoplasia (PNENs)
- Ampullary tumors and distal common bile duct tumors
- Pancreatic trauma, congenital pancreatic malformations, metastases of extrapancreatic tumors into the pancreas
- Surgery of the spleen



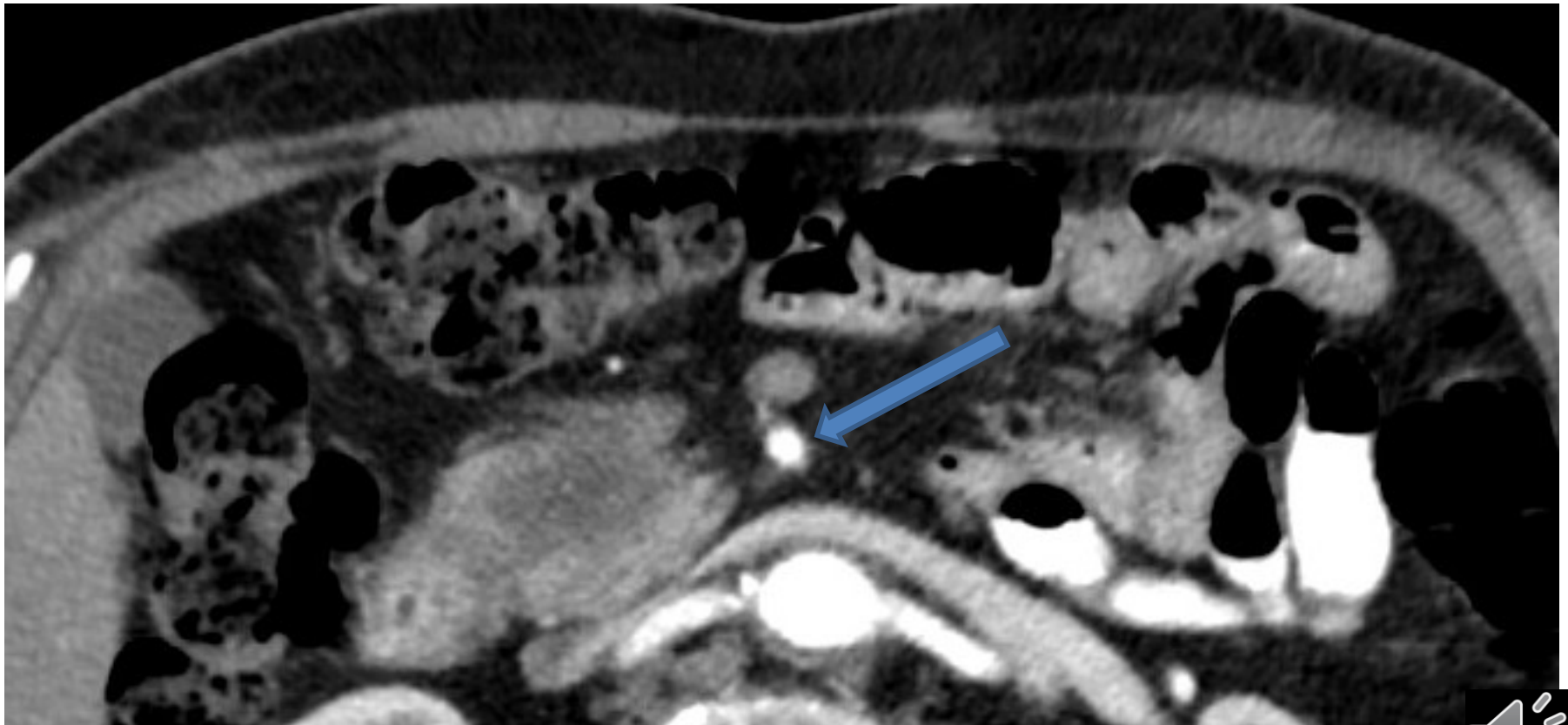
Surgical anatomy



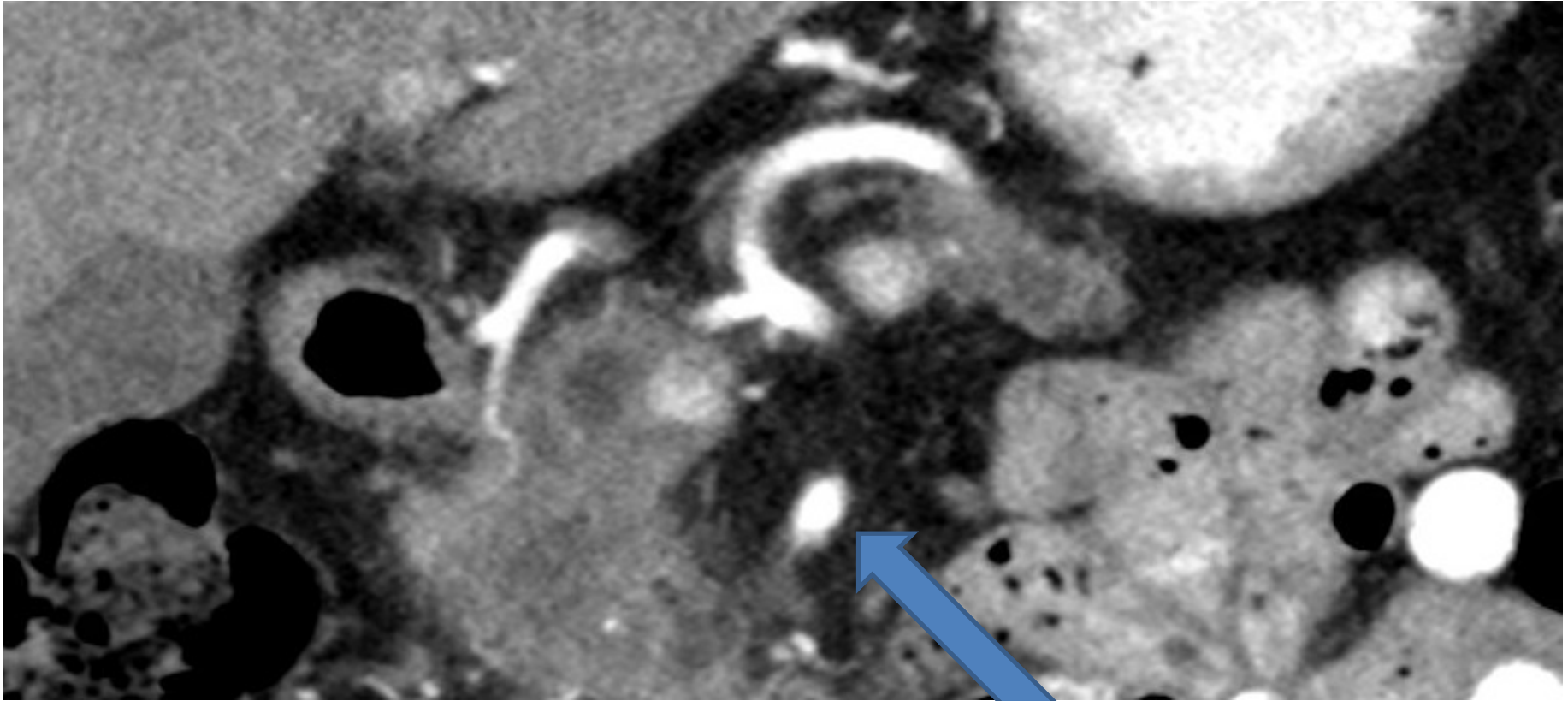
Surgical anatomy



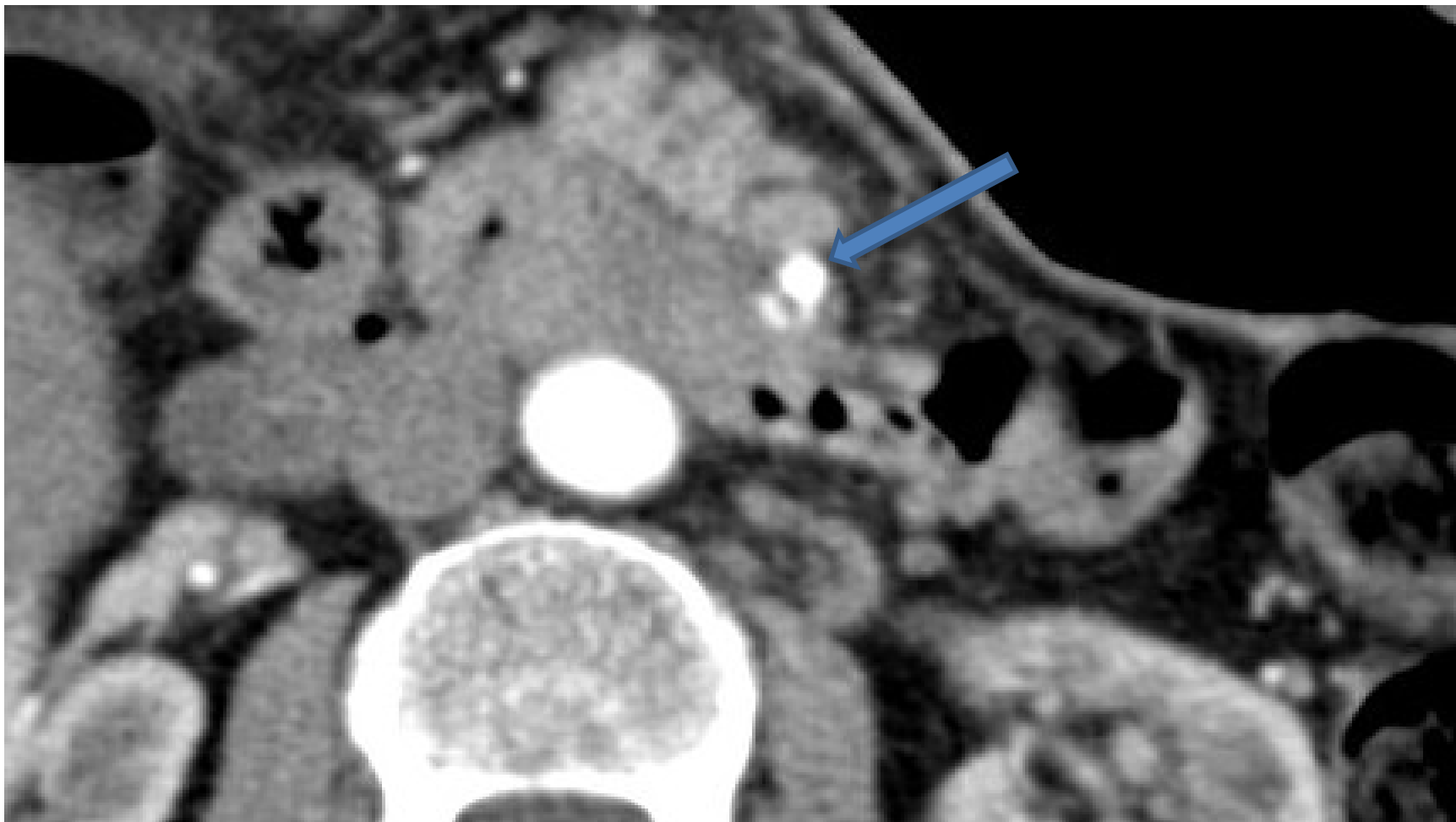
Tumor relationship to superior mesenteric artery (AMS)



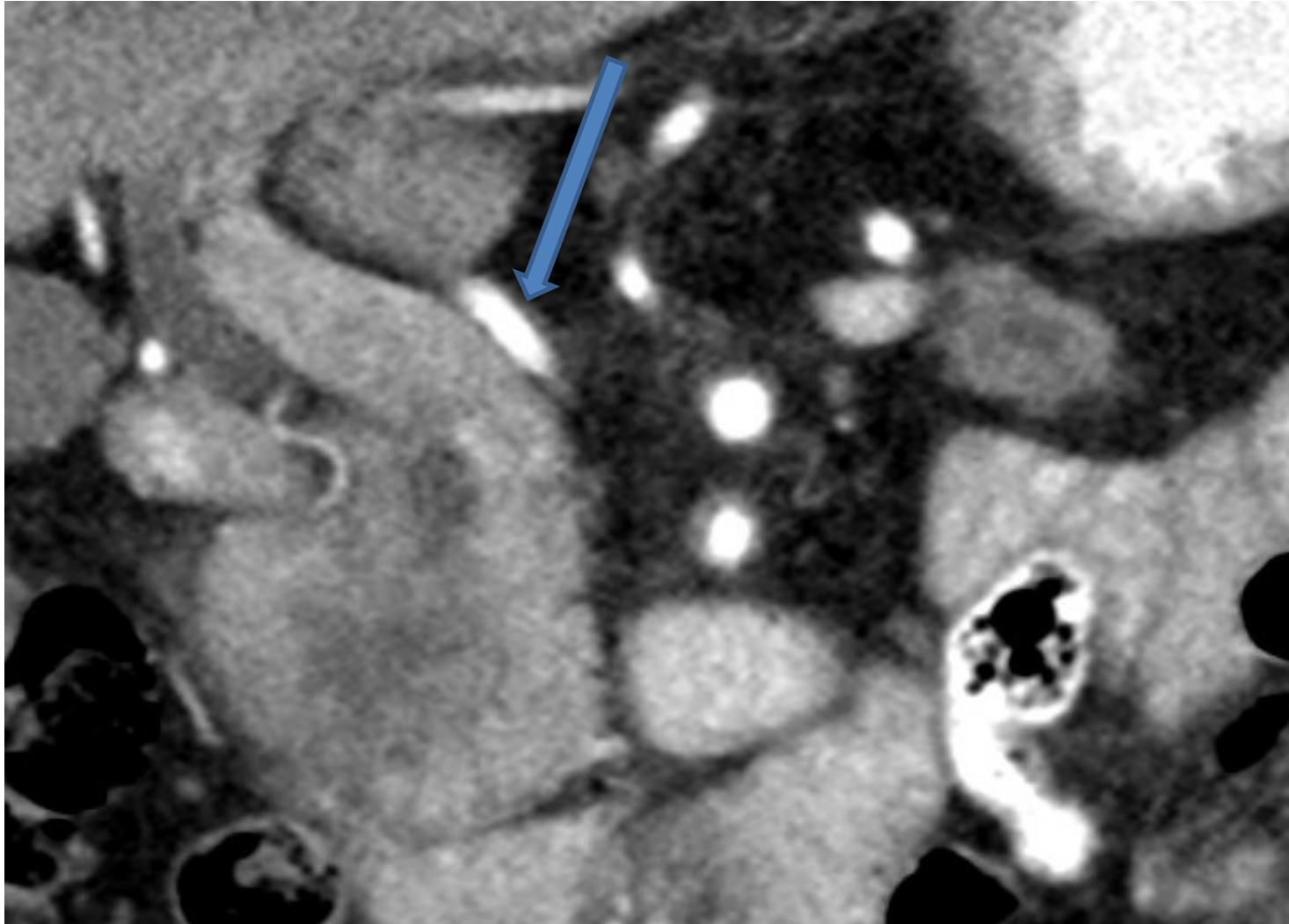
Relationship to AMS



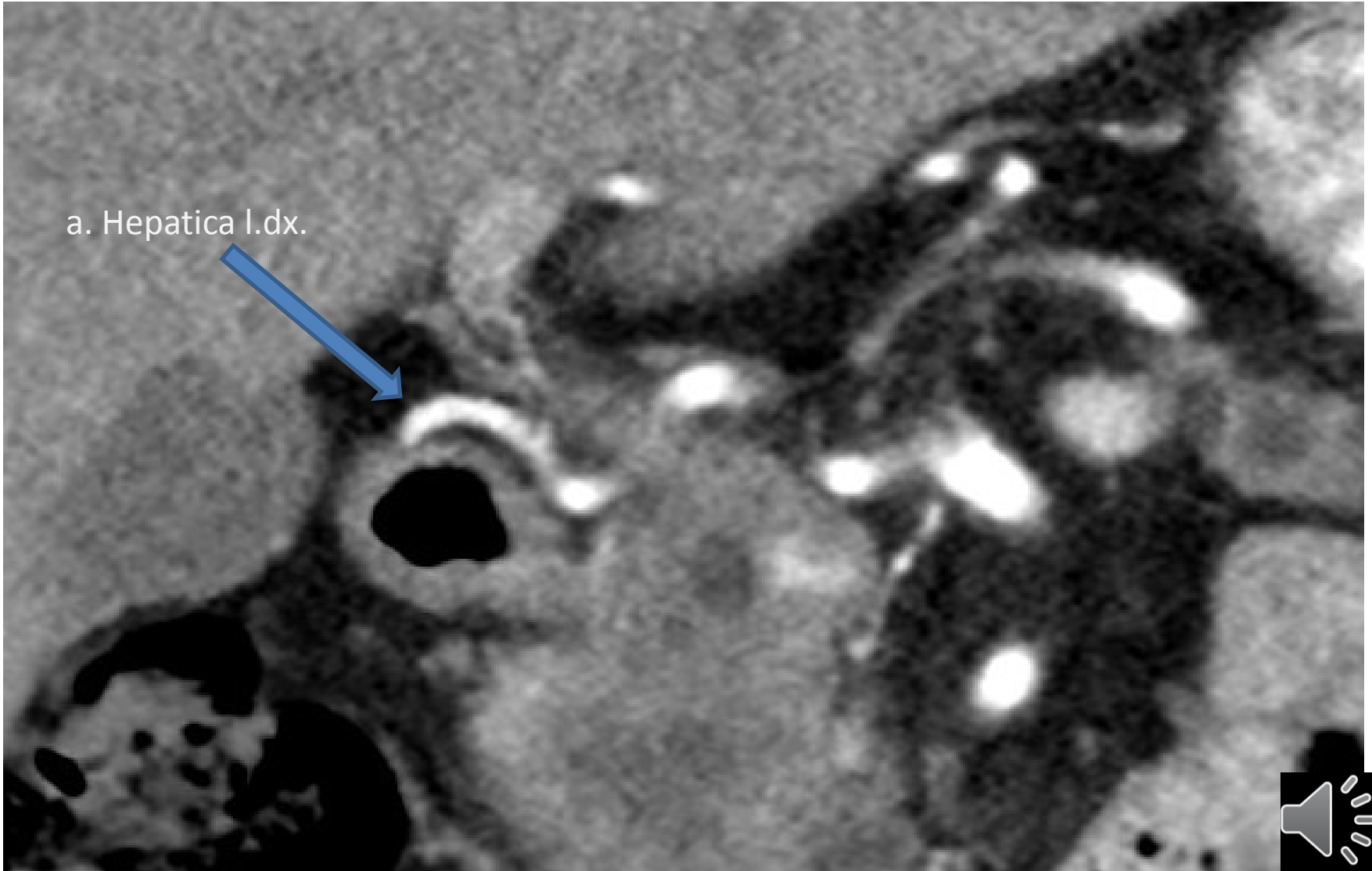
Relationship to AMS – borderline resectable tumor



Relationship of tumor to common hepatic artery

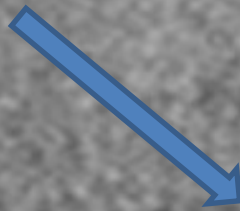


Right hepatic artery



Left hepatic artery

Anomalous a. hepatica l.sin. Arising from a. gastrica sinistra



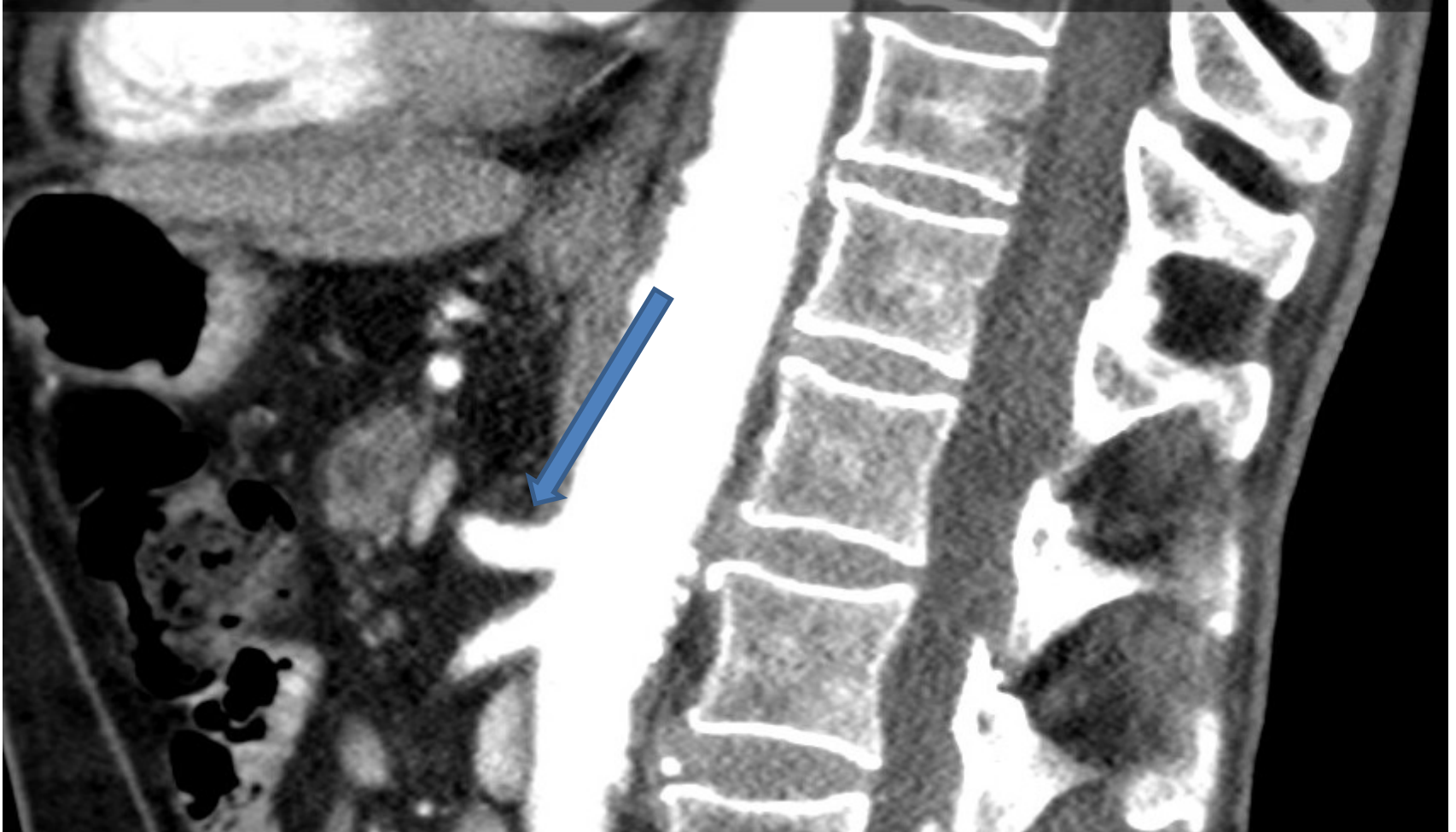
Right hepatica artery



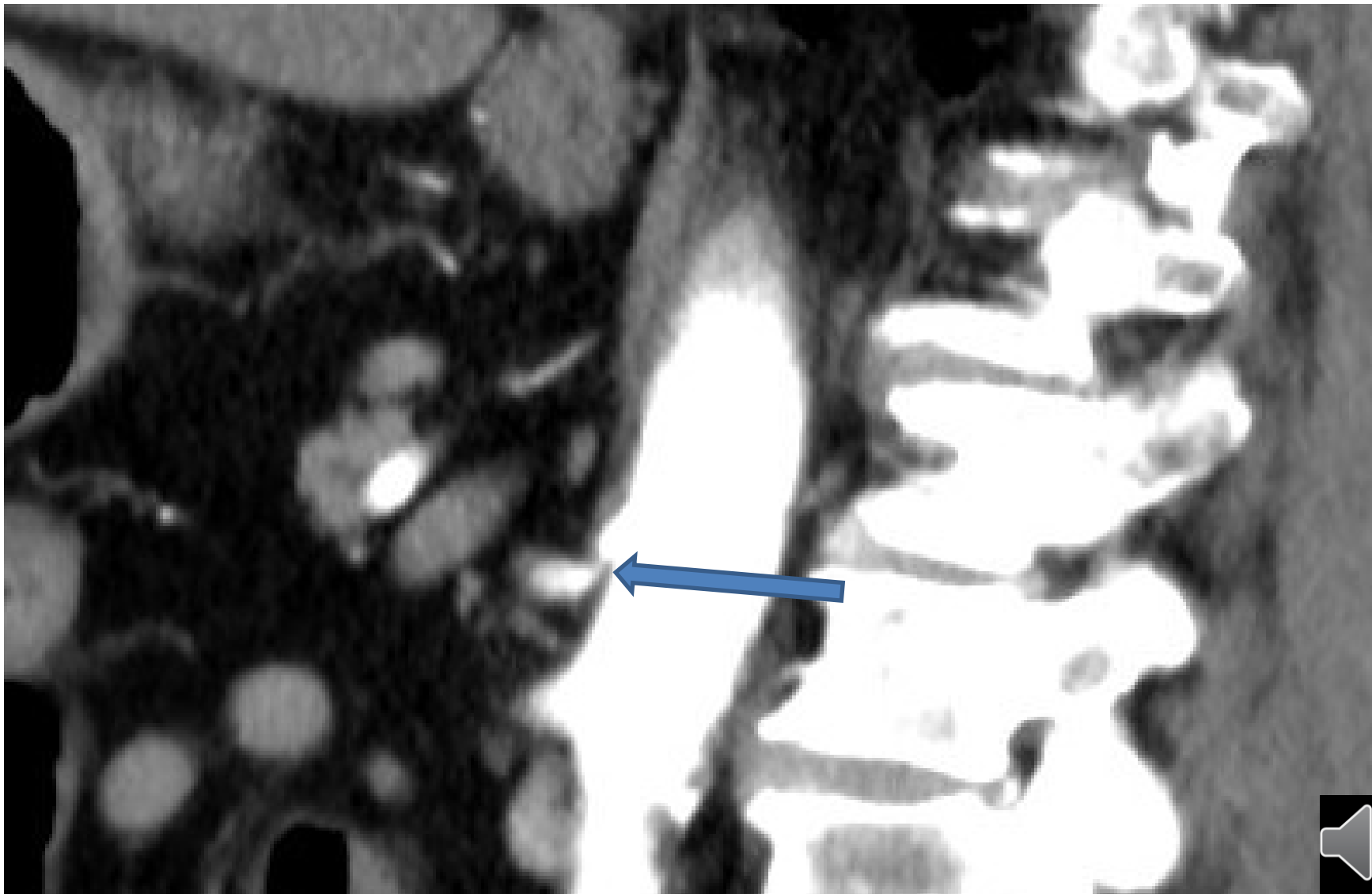
Anomální a. hepatica l.dx. odstupující z AMS



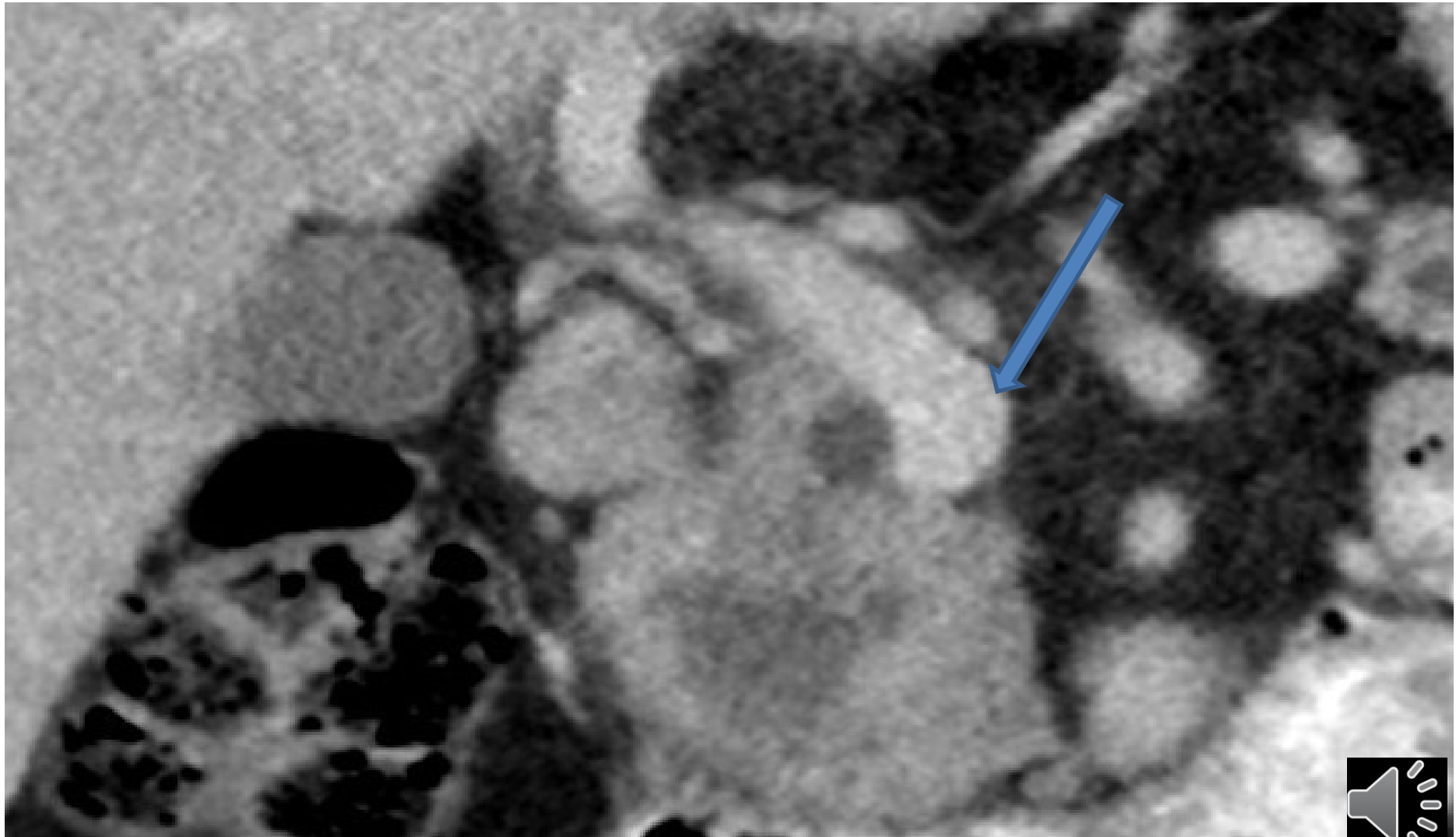
Coeliac trunc



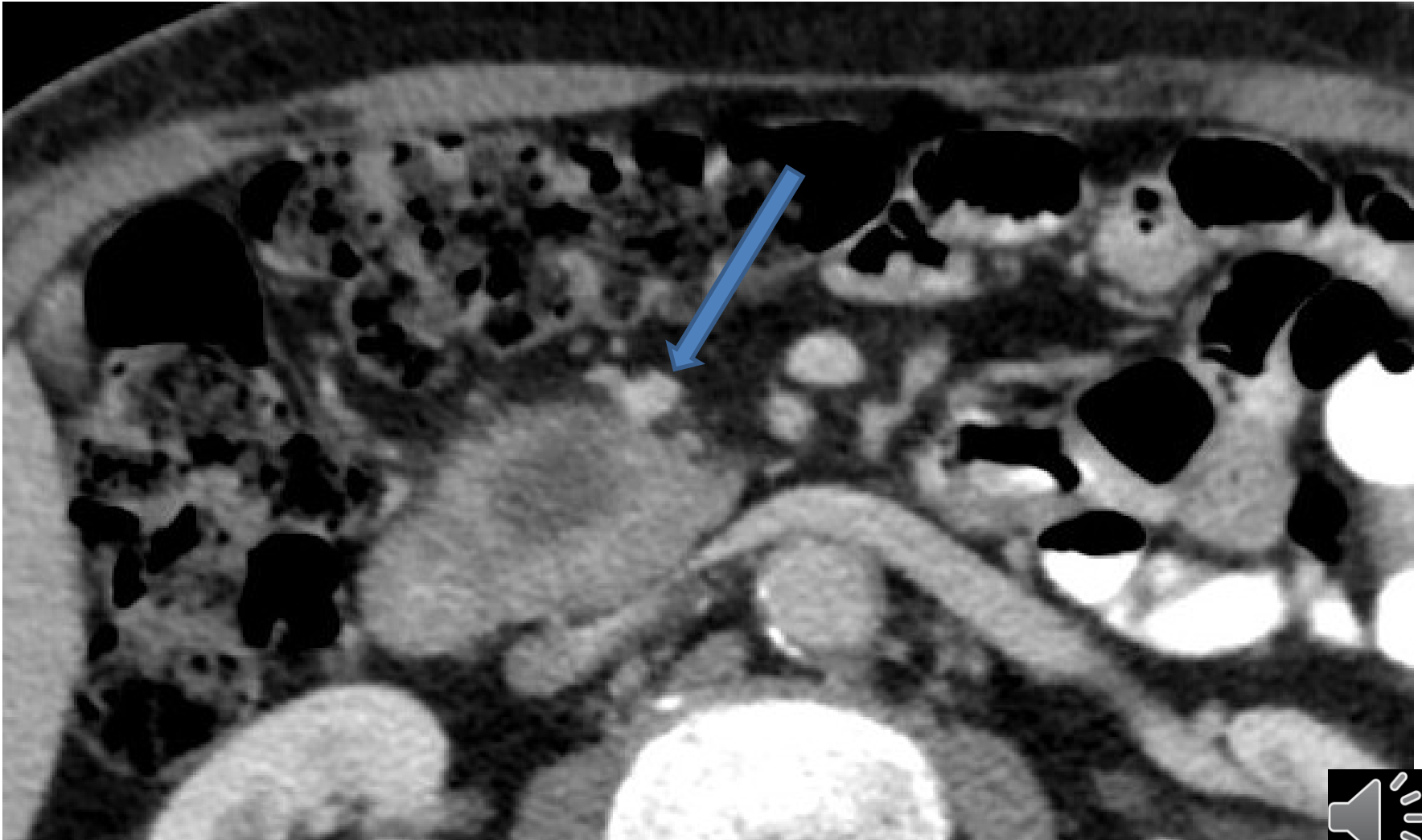
Stenosis of Coeliac trunc



Relationship of tumor to portal vein



Relationship to portal vein and superior mesenteric vein respectively



Surgical physiology

exocrine pancreas

Pancreatic fluid 1-1,5 l / 24 hours

(Note.: Wide variability in different stage of pancreatic tissue damage)

Constitution

bicarbonate + pancreatic enzymes (proteases -trypsin, chymotrypsin, lipases - pancreatická lipasis, fosfolipase A, cholesterolesterasis, lecitinasis, amylasis).



Surgical Physiology

exocrine pancreas

Wide functional reserve

Steatorrea occurs when more than 90% of pancreatic parenchyma is destroyed

Pancreatic malabsorption

- Lower lipolysis : higher fat in the stool -> intestinal dysmotility-> shorter transit time
- Malabsorption of the vitamins A,D,E, K

Clinical signs: flatulence, abdominal pain, fatigue

Therapy: pancreatic enzymes supplementation in tablet form

Relative exocrine insufficiency due to the type of GIT reconstruction - pancreato-gastro anastomosis



Surgical physiology

endocrine pancreas

- **Langerhans islets** (insulae pancreaticae)
- Unequal dispersion in the gland - ↑↑ tail, ↓↓ head
- Beta cells - insulin, Alpha cells- glukagon, Delta cells- somatostatin, F cells – pancreatic polypeptide, gastrin, serotonin
- **New onset od diabetes mellitus can indicate early panreatic cancer!**
- **After total pancreatectomy can appeared so called brittle diabetes – attacts of sudden hypoglycaemia with the danger of hypoglycaemic coma.**



Imaging methods

CT

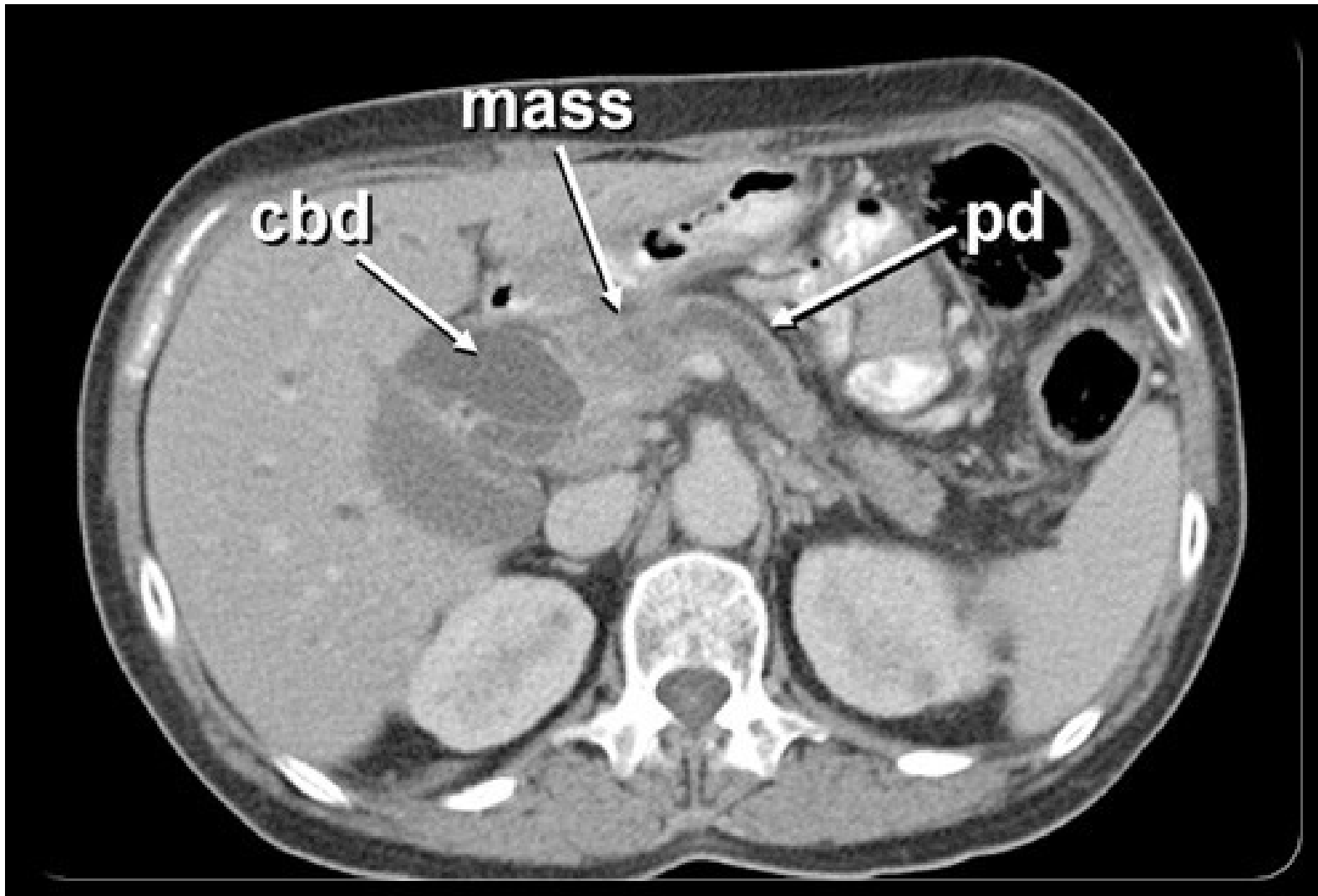
- MR / MRCP
- EUS (endoscopic ultrasound) **resp.** EUS FNAB (fine needle aspiration biopsy).
- ERCP (endoscopic retrograde cholangio-pancreaticography)
- PET CT (positron emission computed tomography)
- PET MR

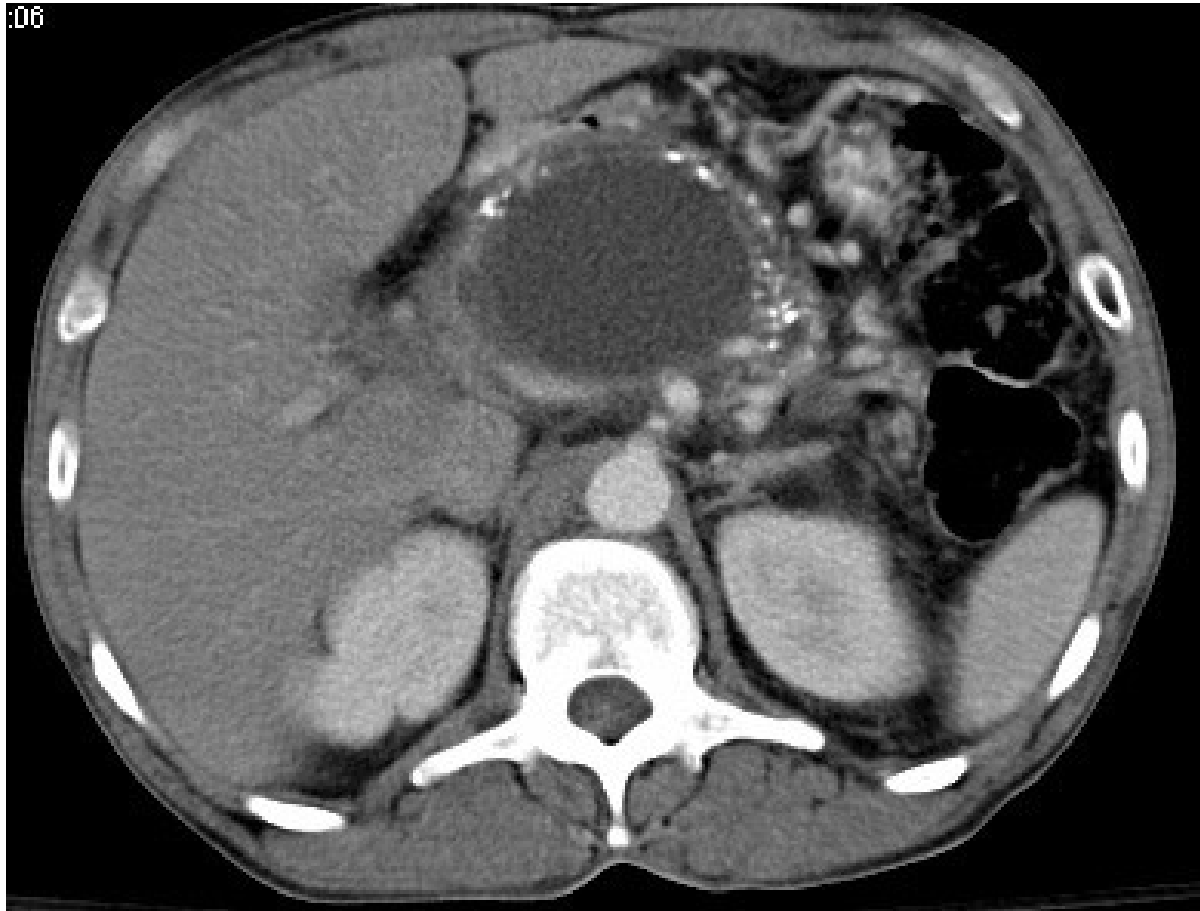


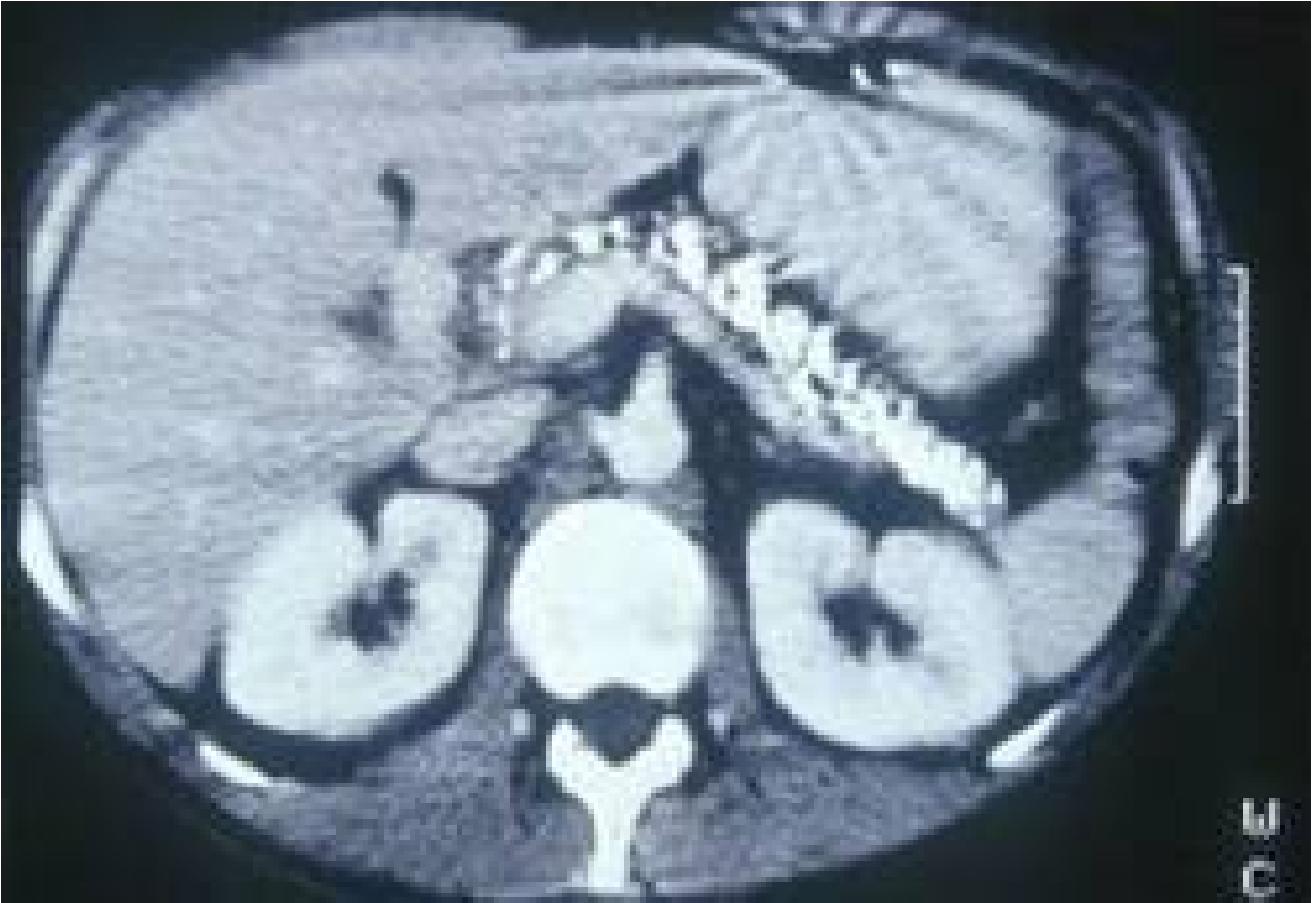
Computed Tomography

CT





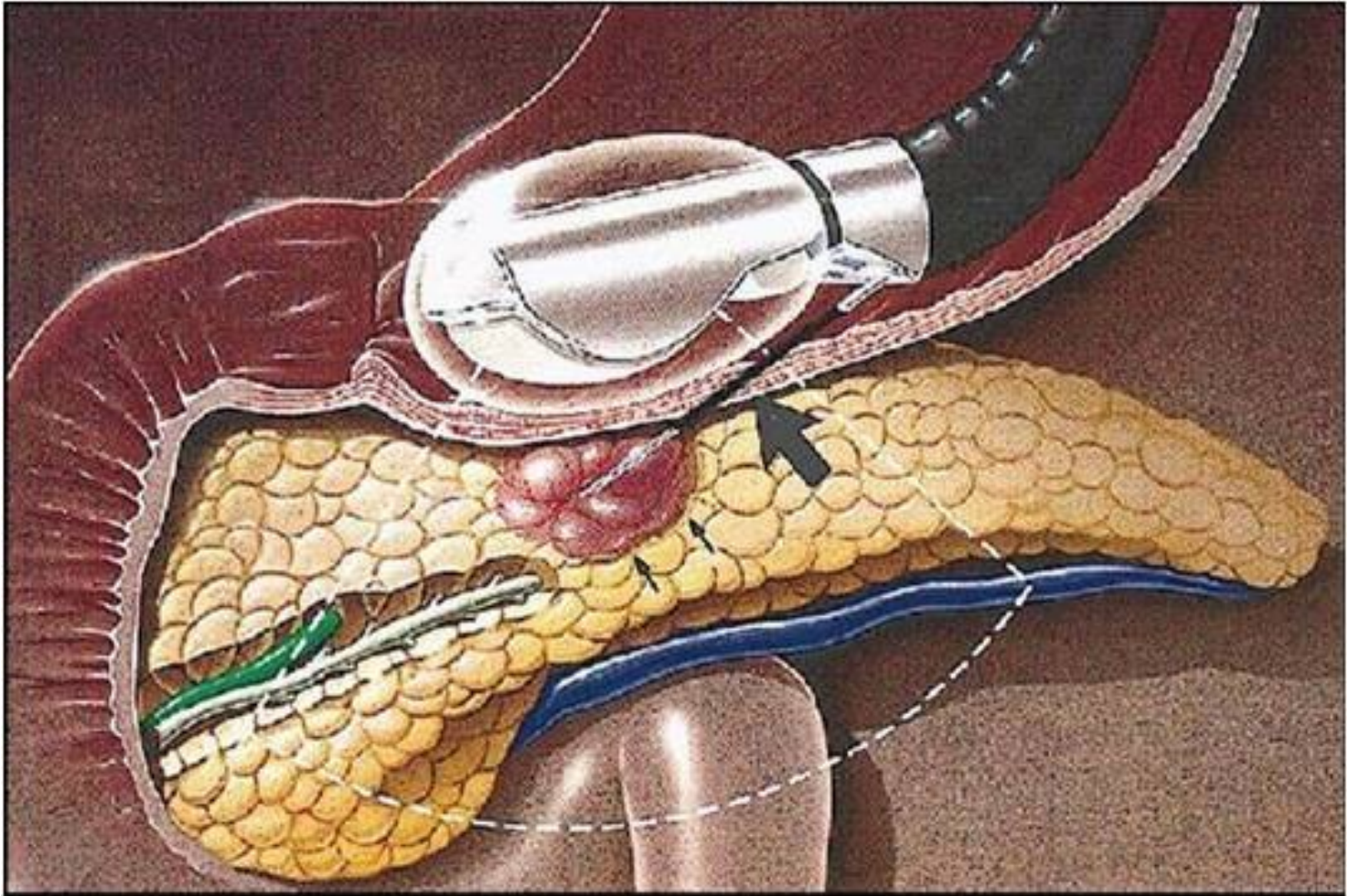


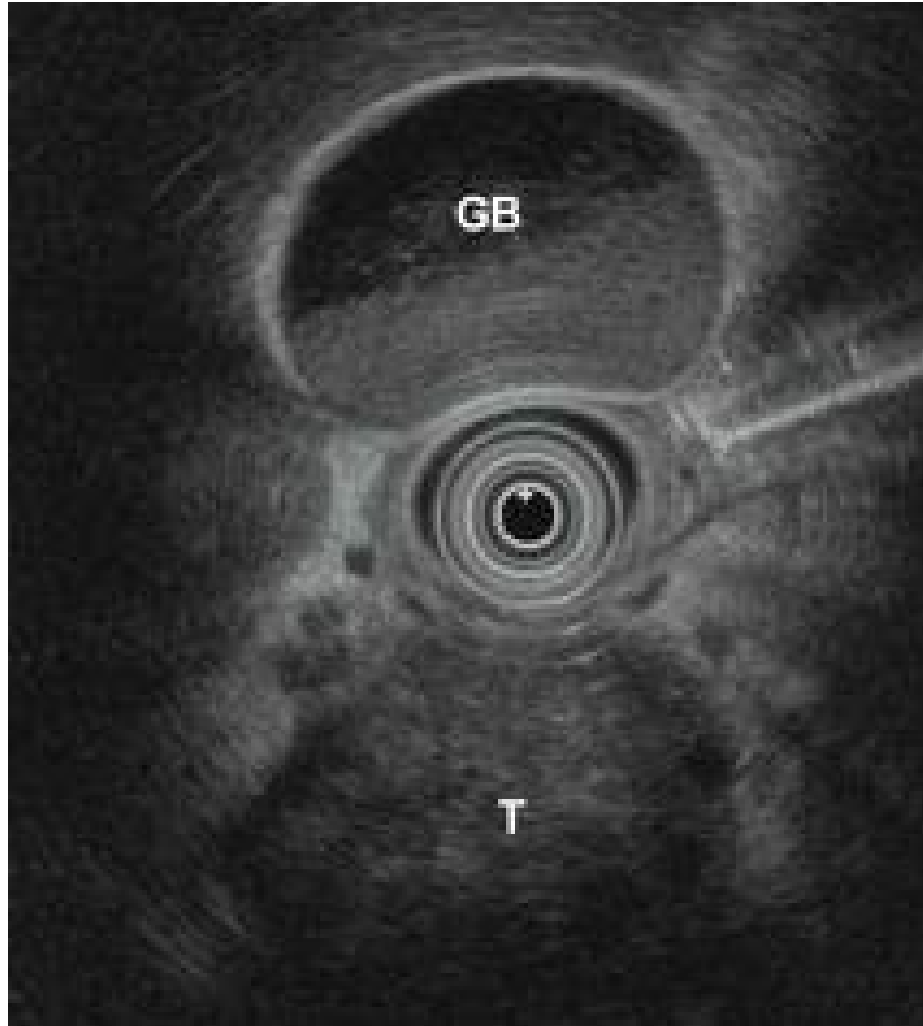


Endoscopic Ultrasound

EUS







EUS

Fine Needle Aspiration Biopsy

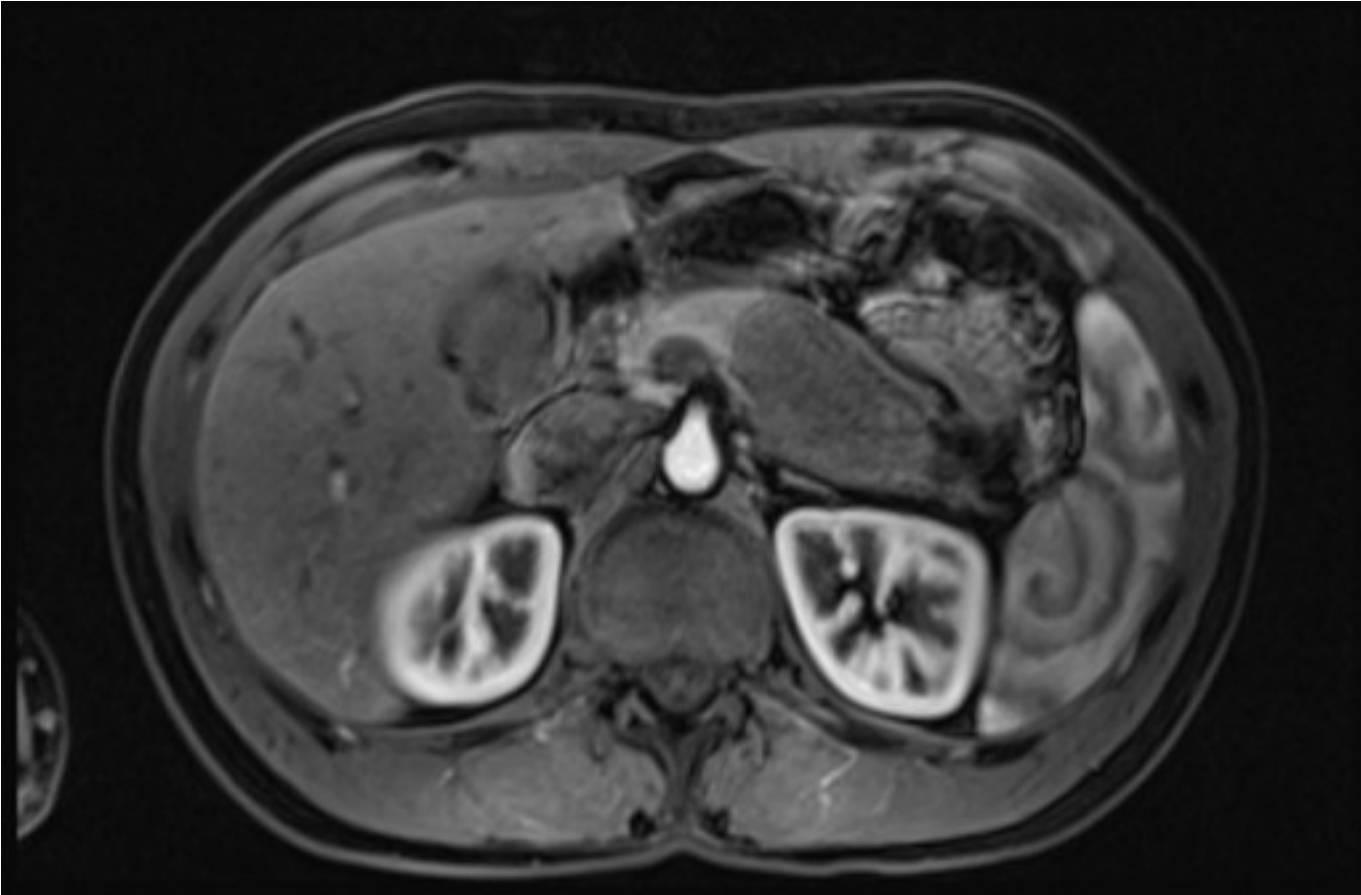


Magnetic Resonance Imaging

MRI





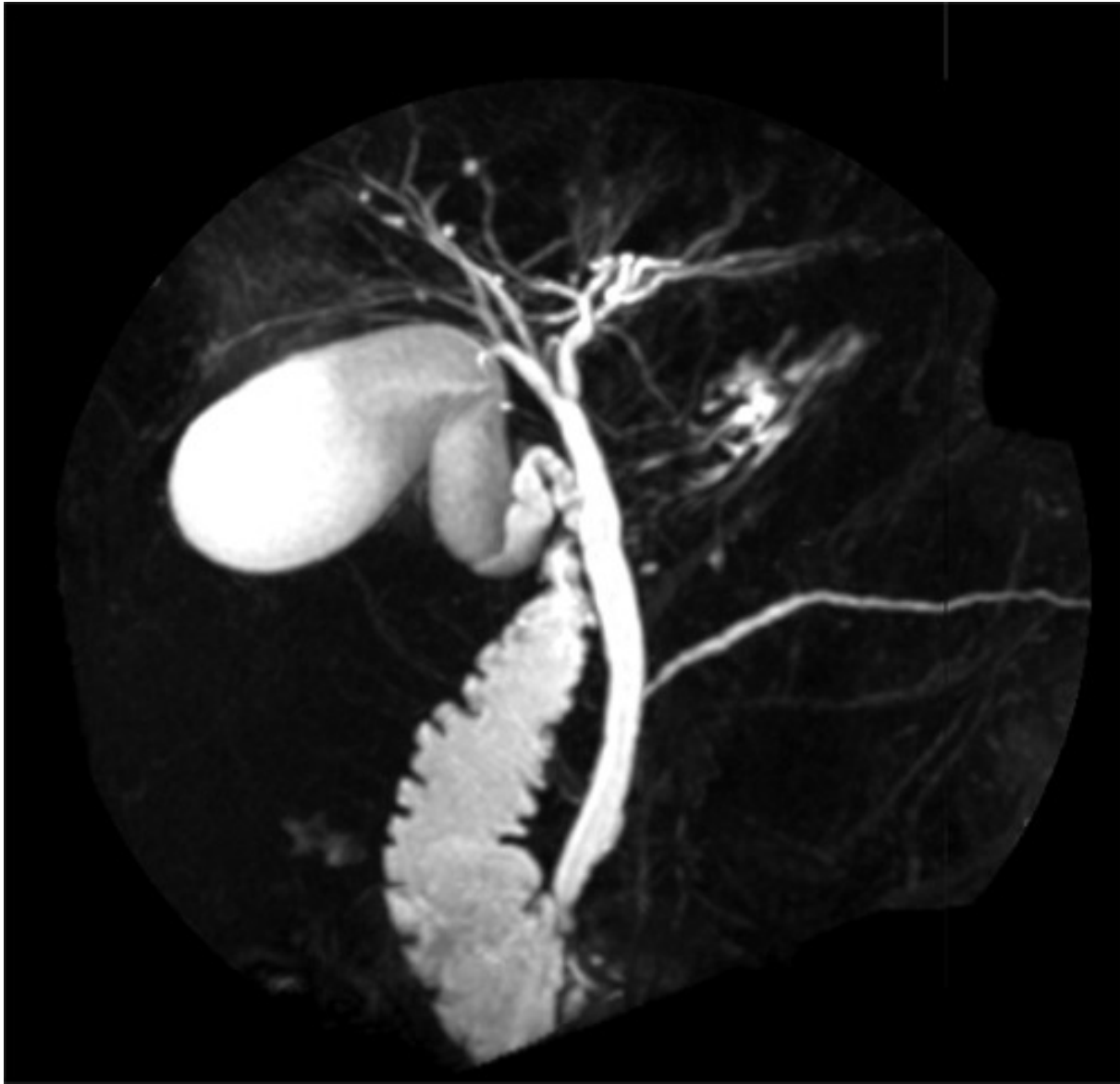


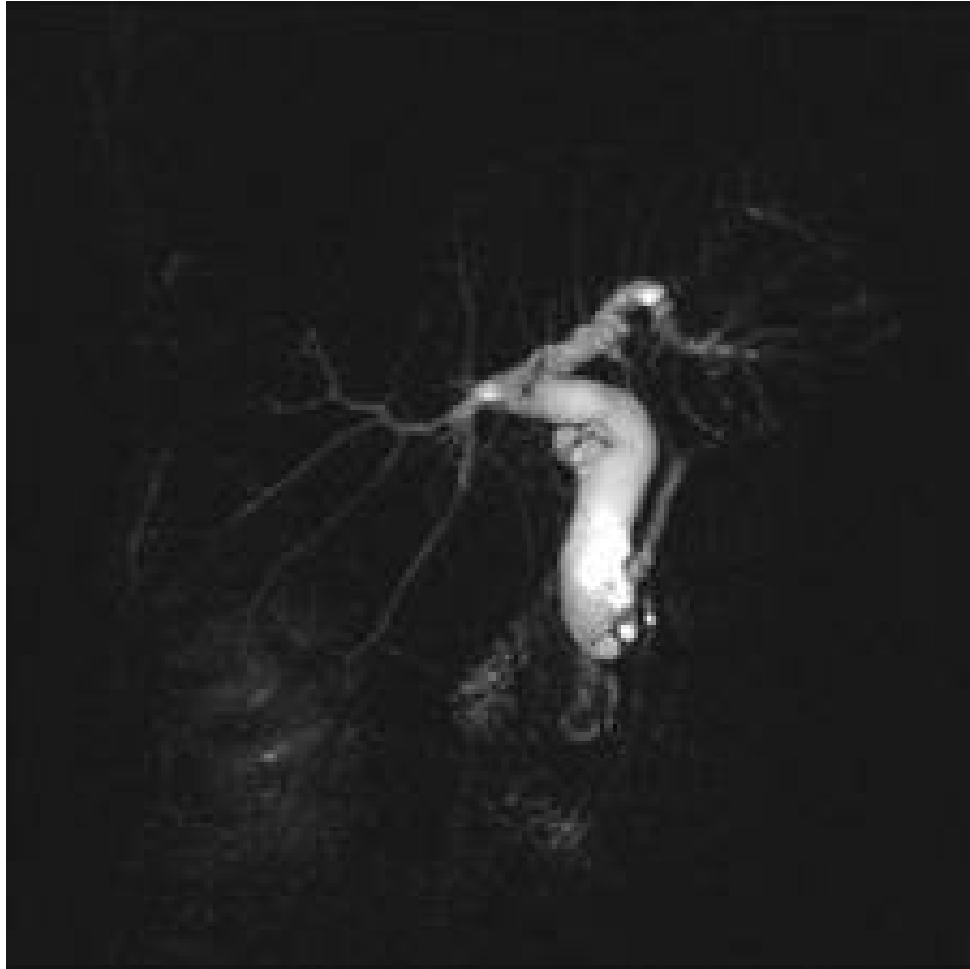
Magnetic Resonance Cholangio- Pankreaticography

MRCP



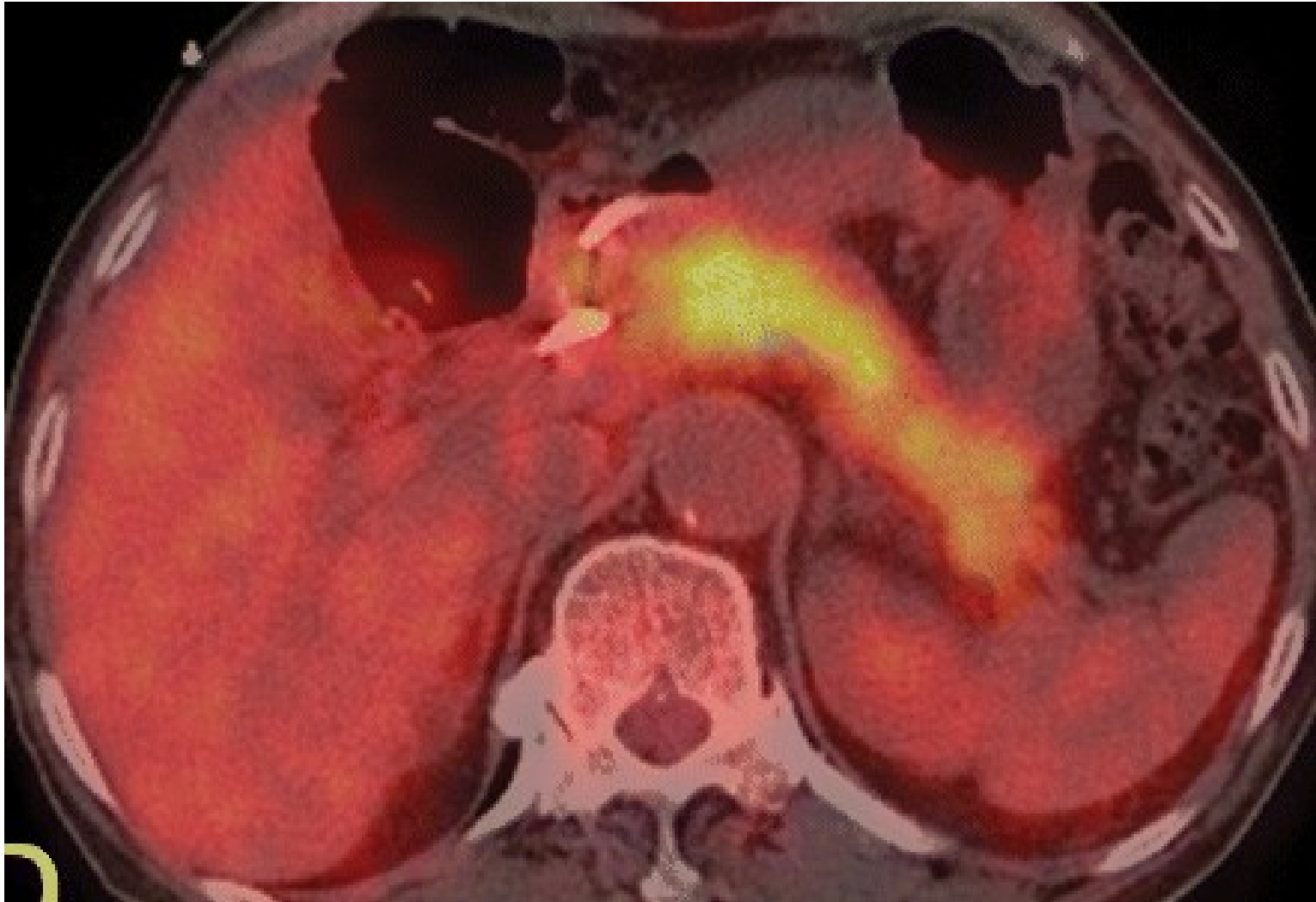


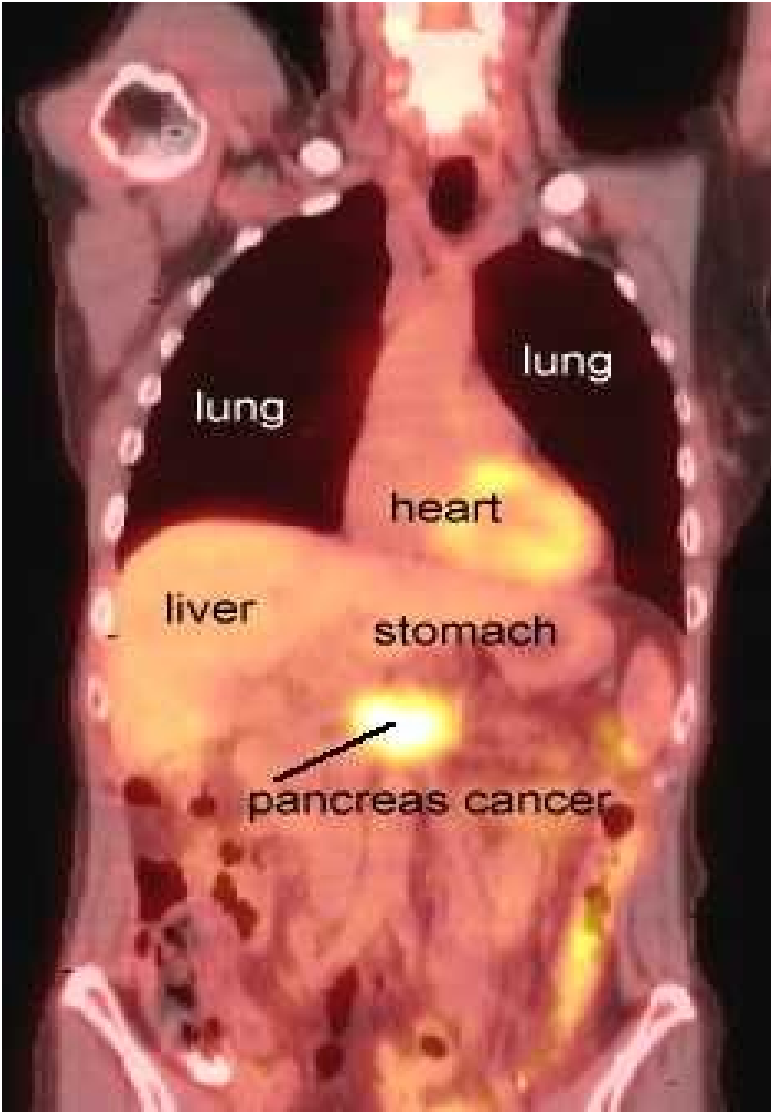




PET / CT





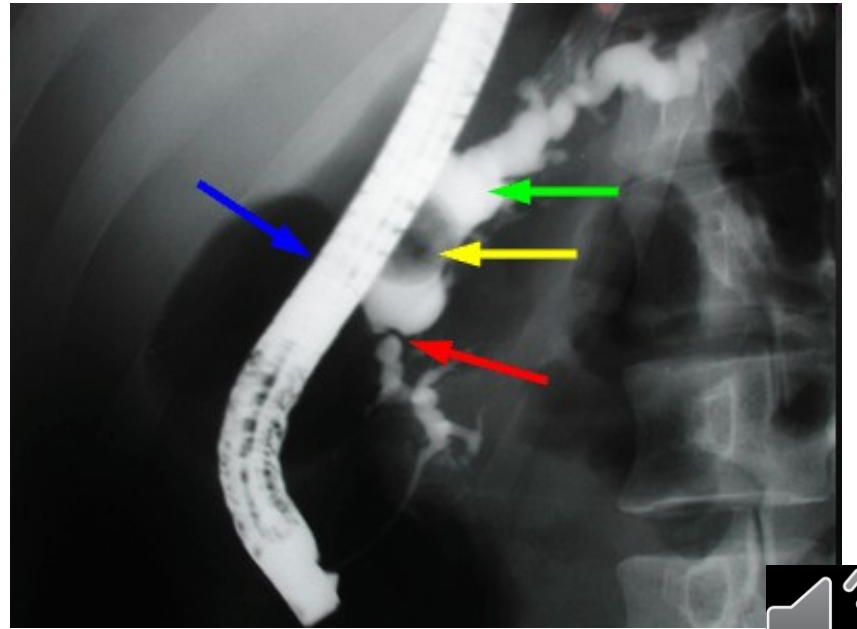
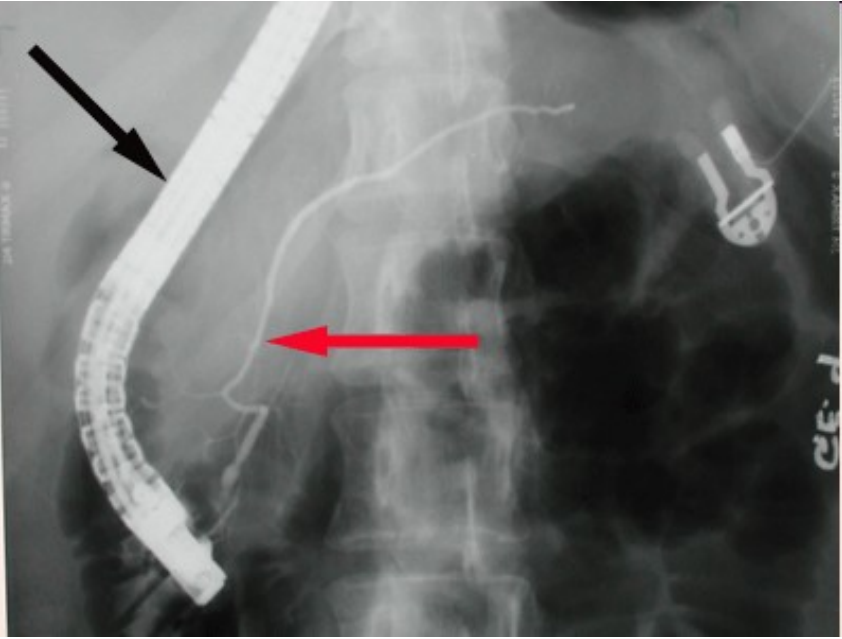


Endoscopic Retrograde Cholangio- Pancreaticography

ERCP

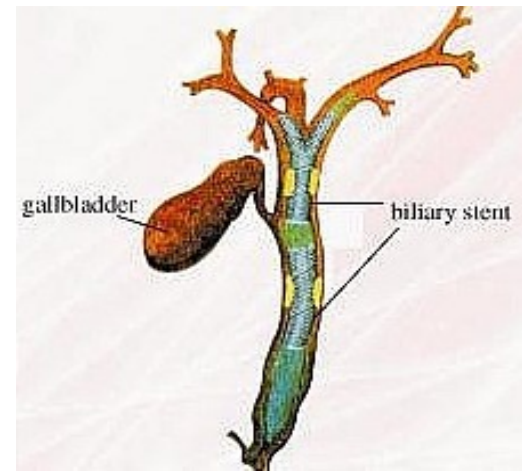






Biliary drainage

ERCP



PTD (PERCUTANEOUS TRANSHEPATIC DRAINAGE)

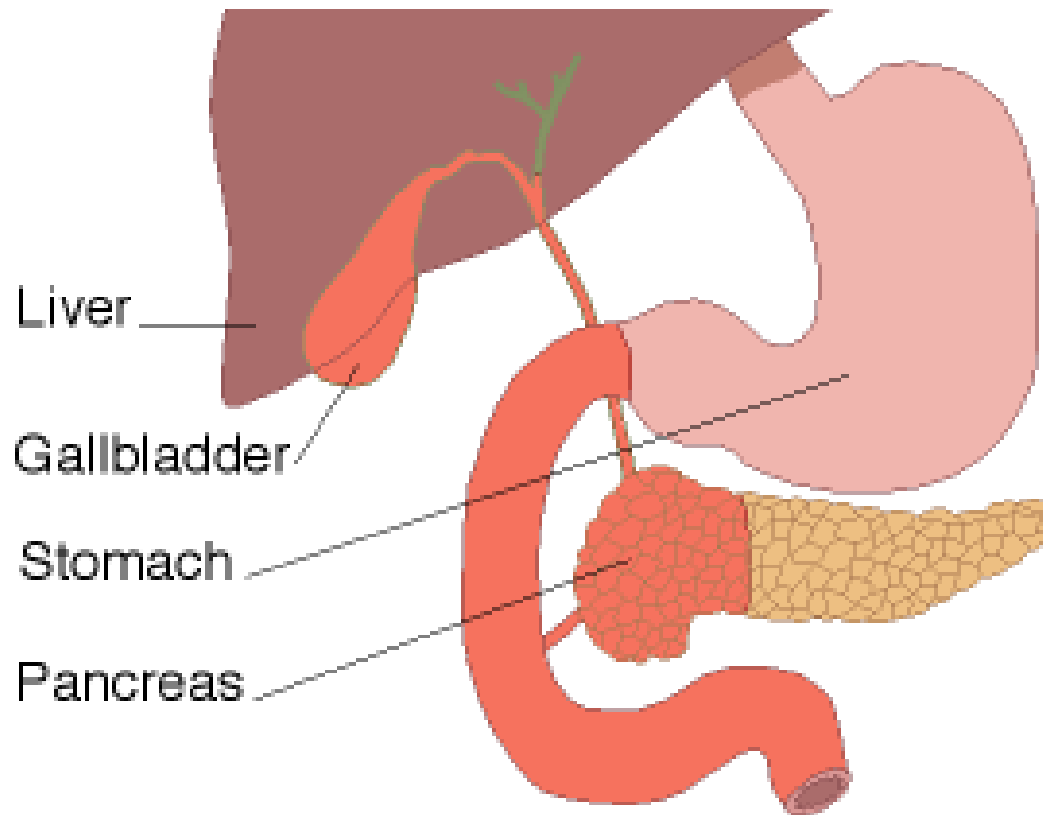


Surgical procedures

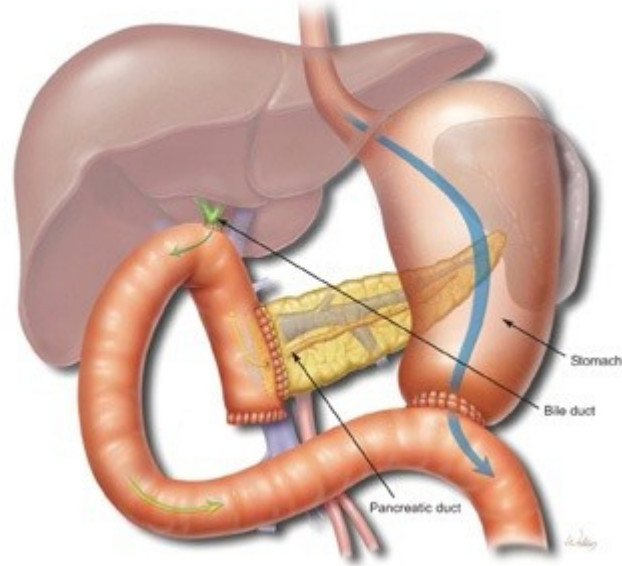
- Pancreatoduodenectomy
- Central pancreatectomy
- Distal splenopankreatectomy
- Distal „spleen-preserving“ pancreatectomie
- Enucleatio
- Drainage and bypass procedures



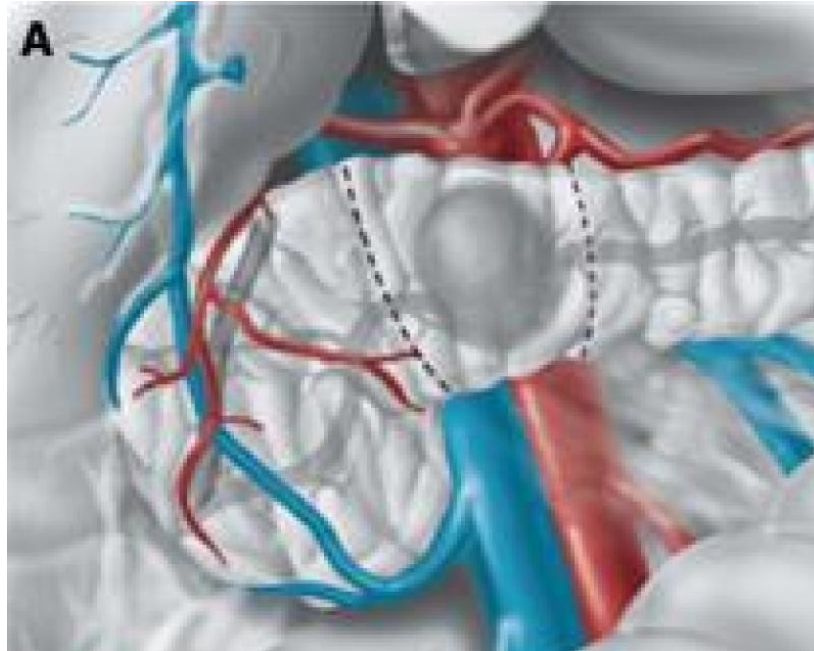
Pancreato-duodenectomy



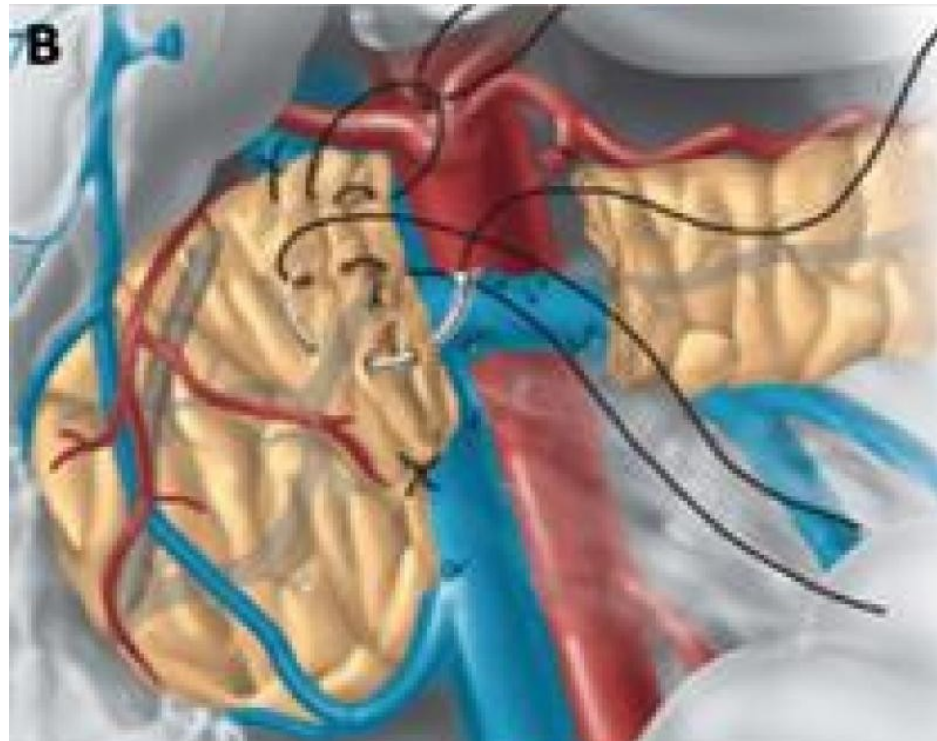
Pancreato-duodenectomy reconstruction



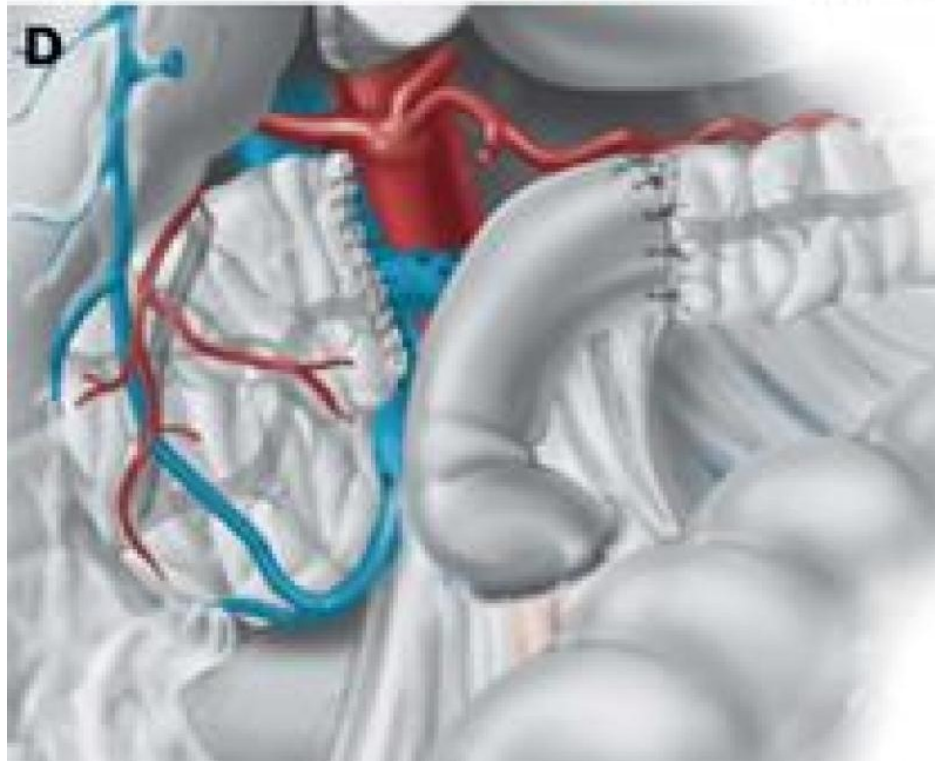
Central Pancreatectomy



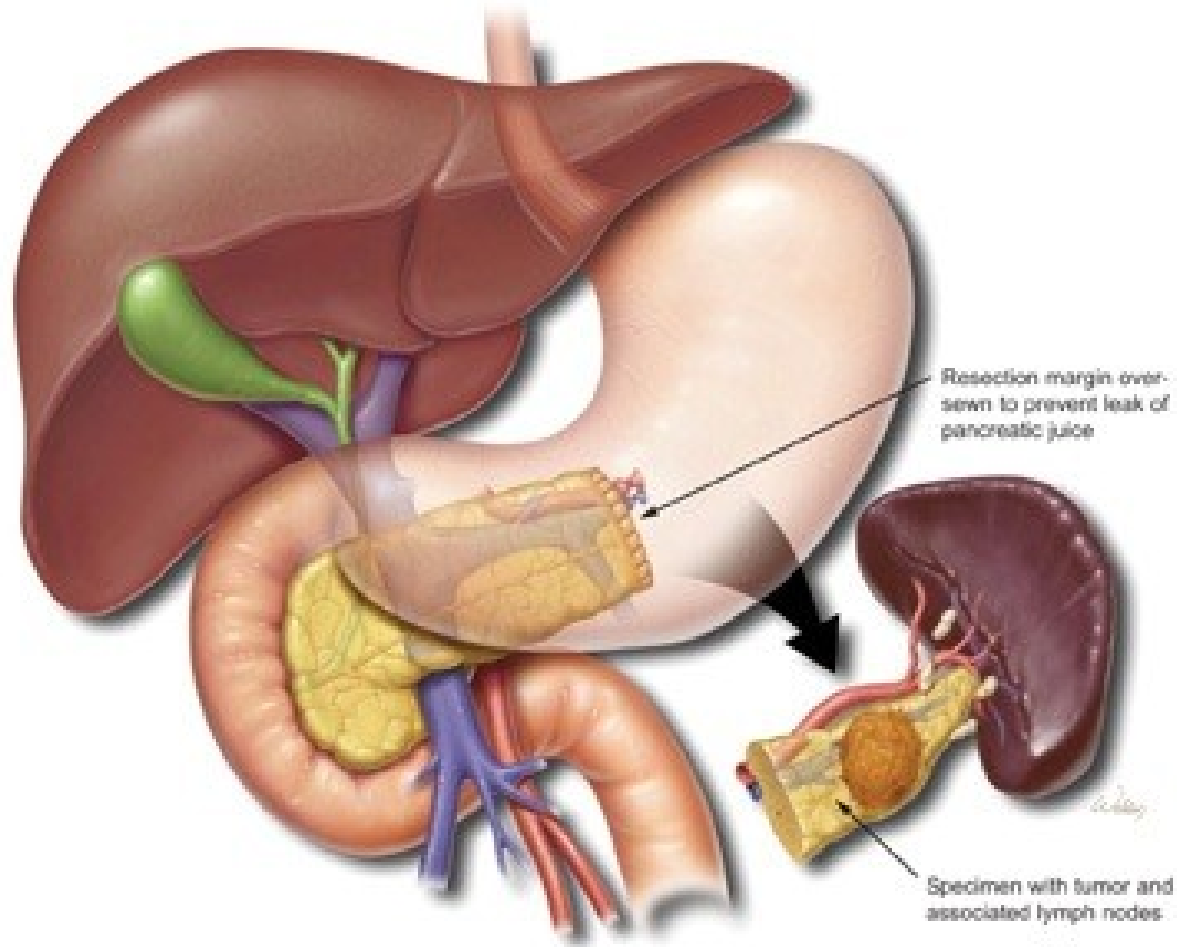
Central Pancreatectomy



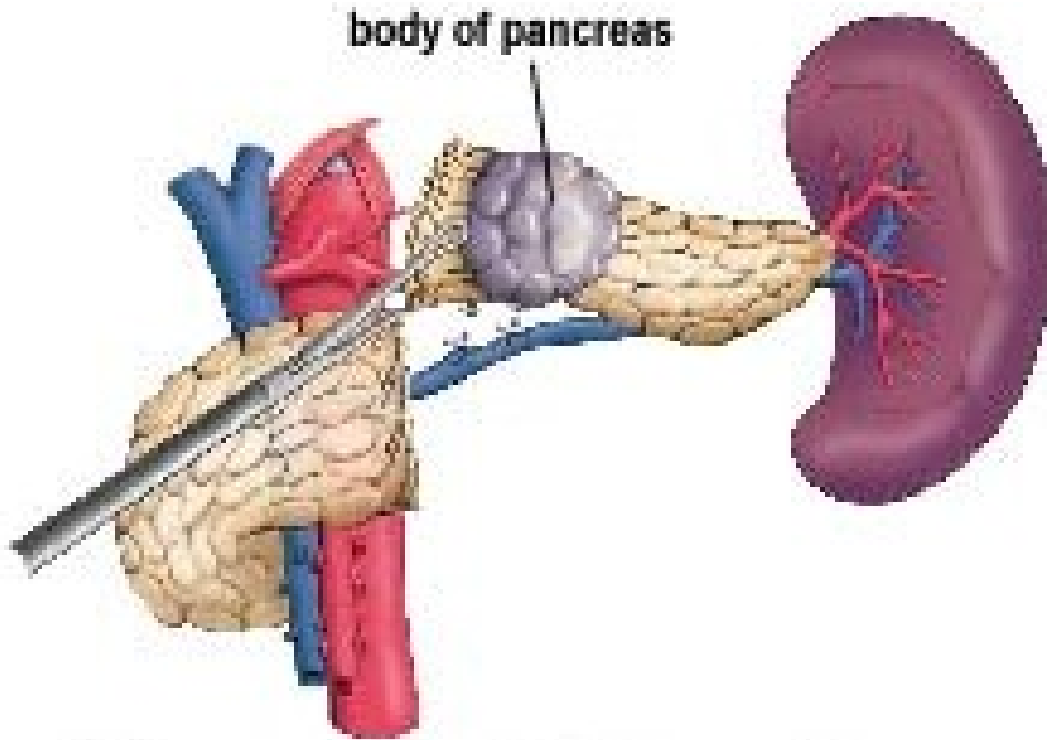
Central Pancreatectomy



Splenopancreatectomy



Distal „spleen-preserving“ pancreatectomy



Enucleatio

Insulinoma



Bypass and drainage procedures

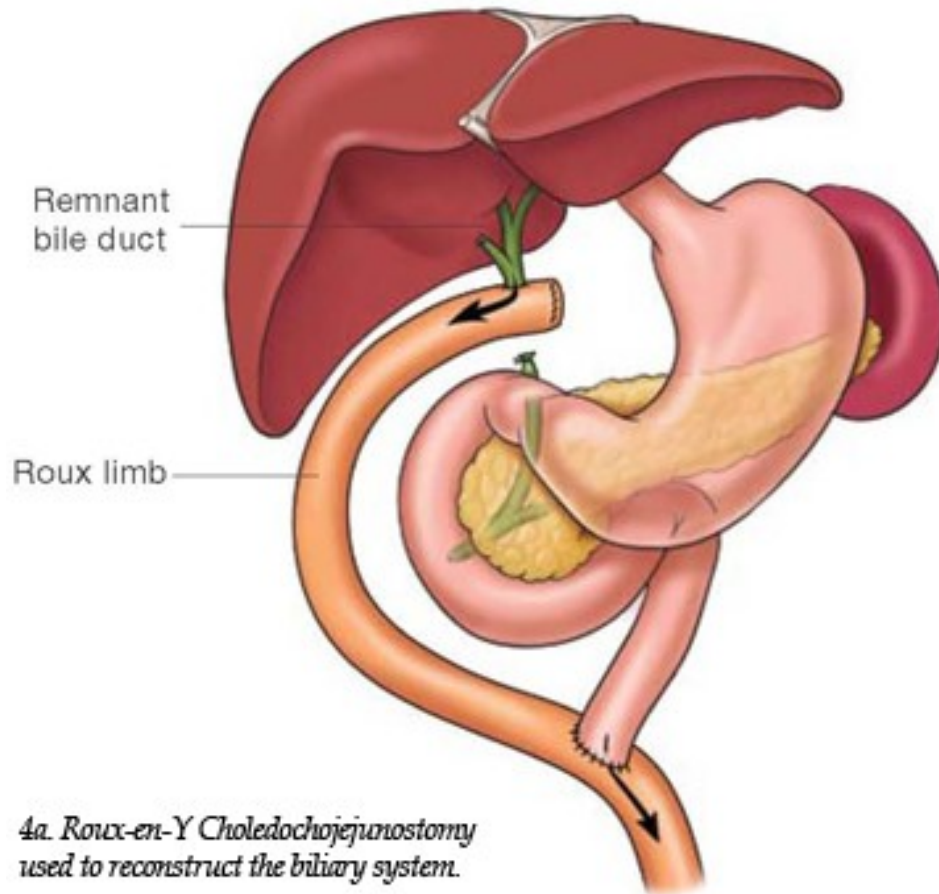




César Roux

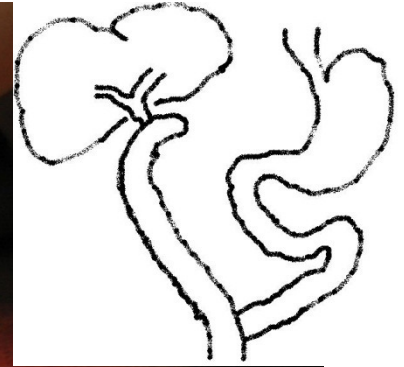
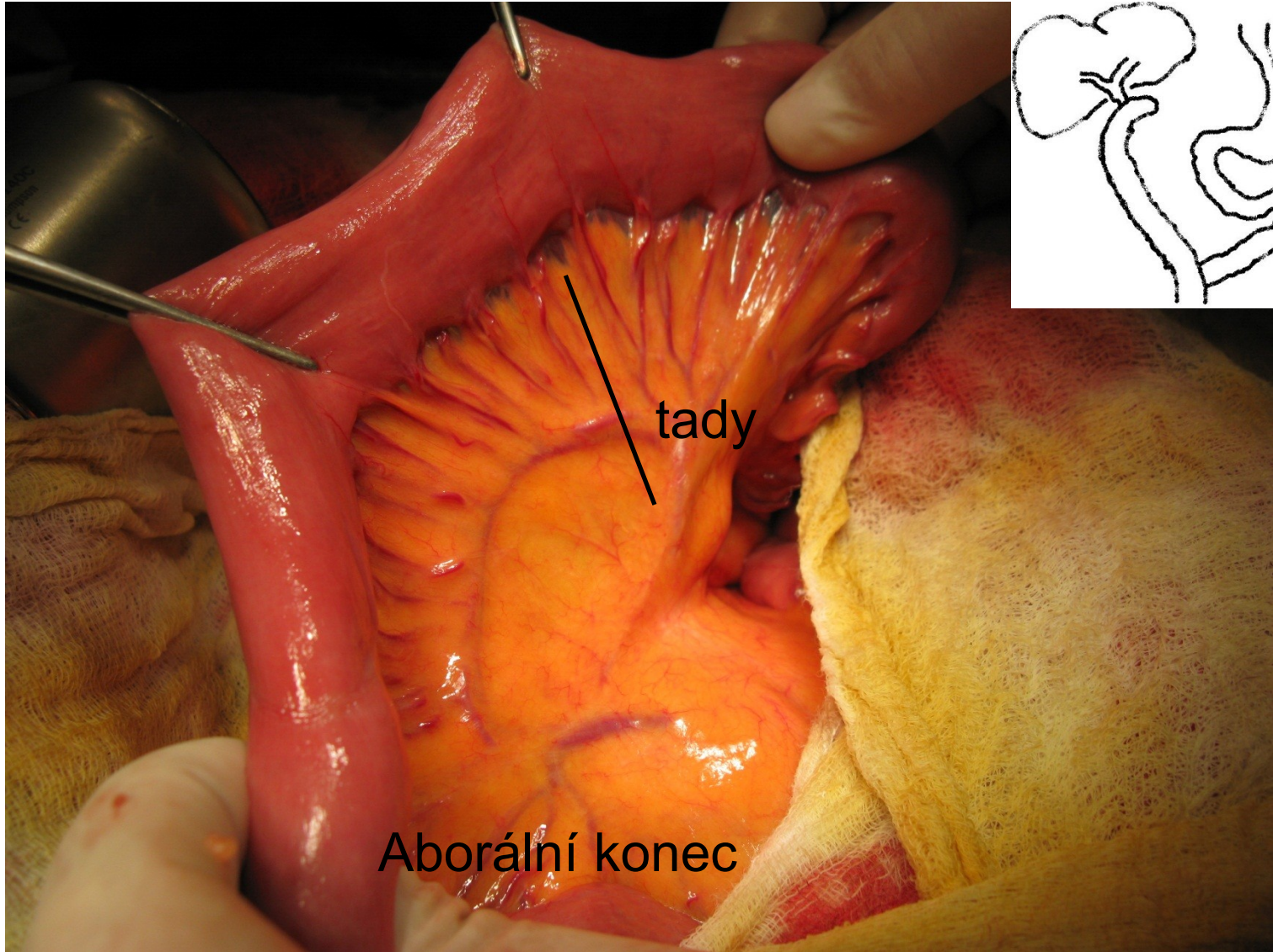
1857-1934

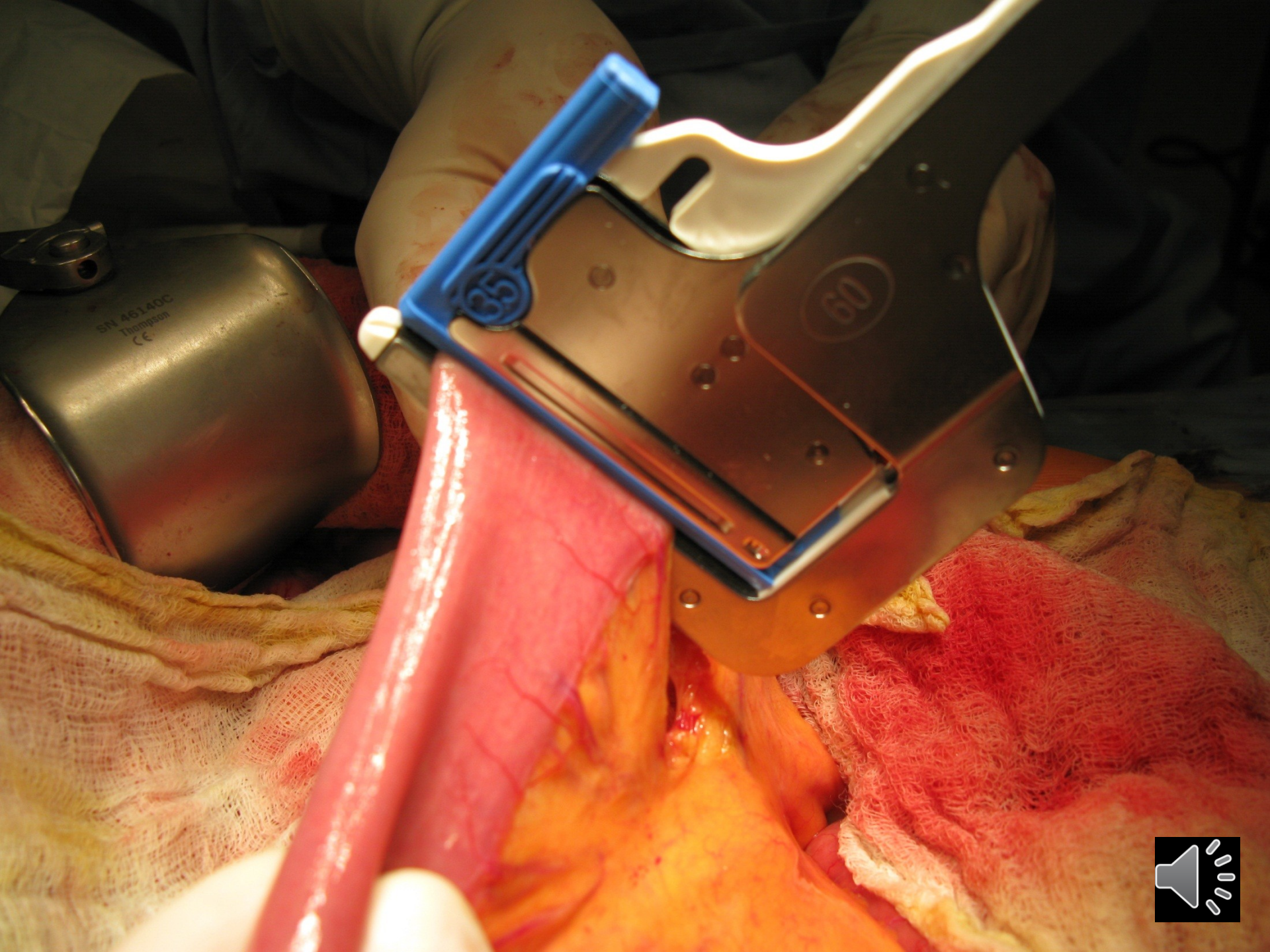
Hepatico-jejuno anastomosis sec. Y-Roux

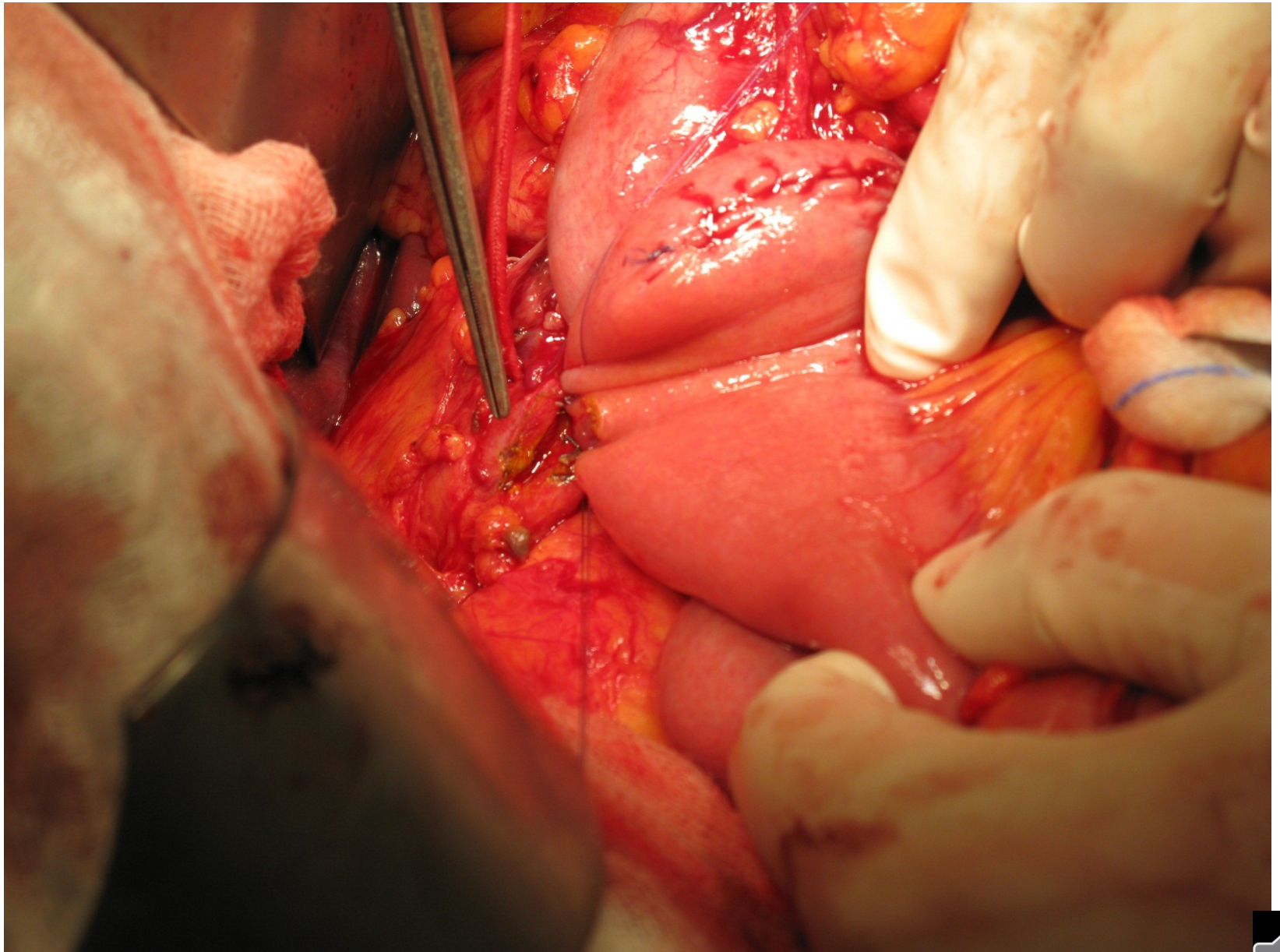


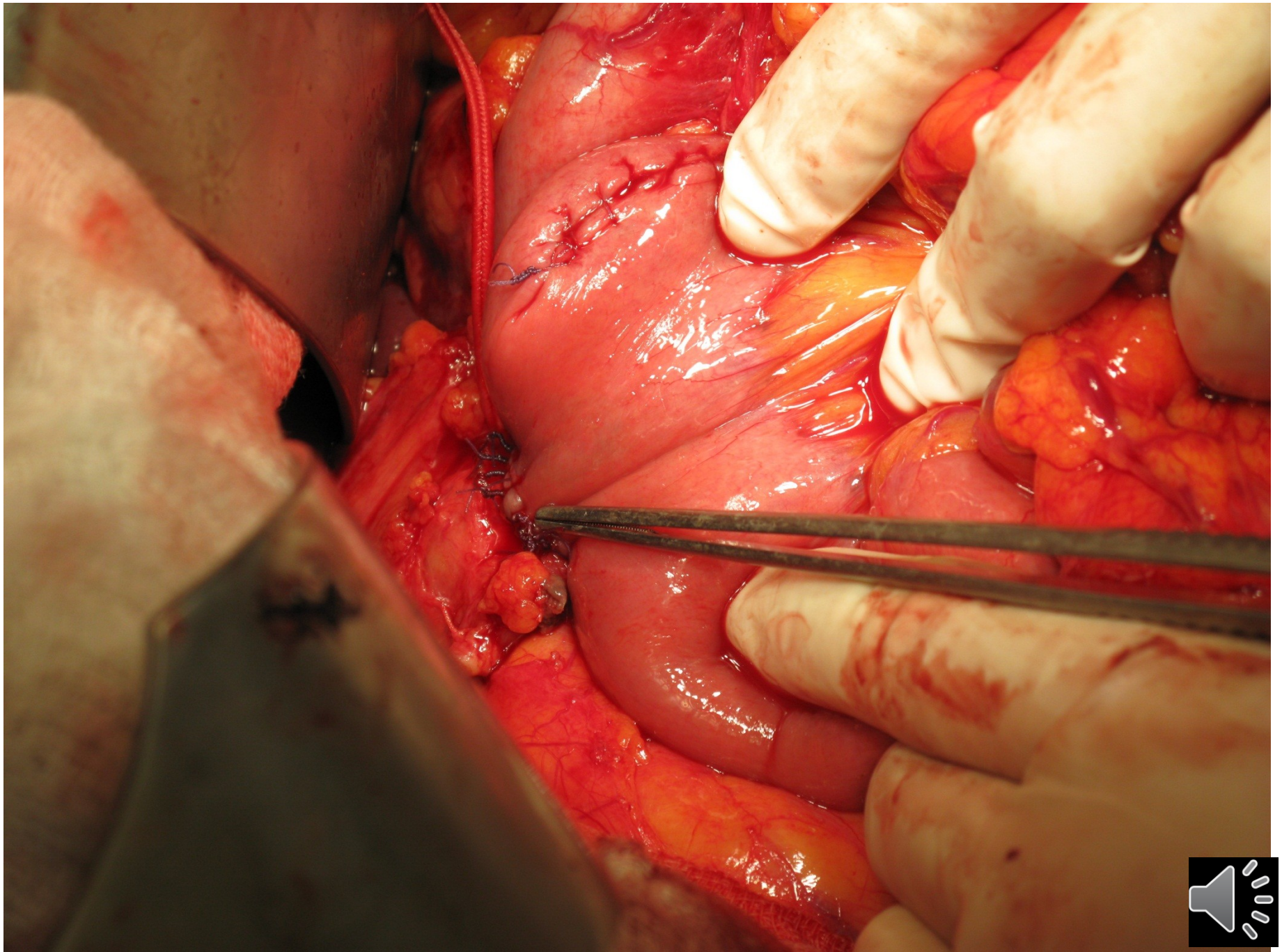
*4a. Roux-en-Y Choledochojejunostomy
used to reconstruct the biliary system.*

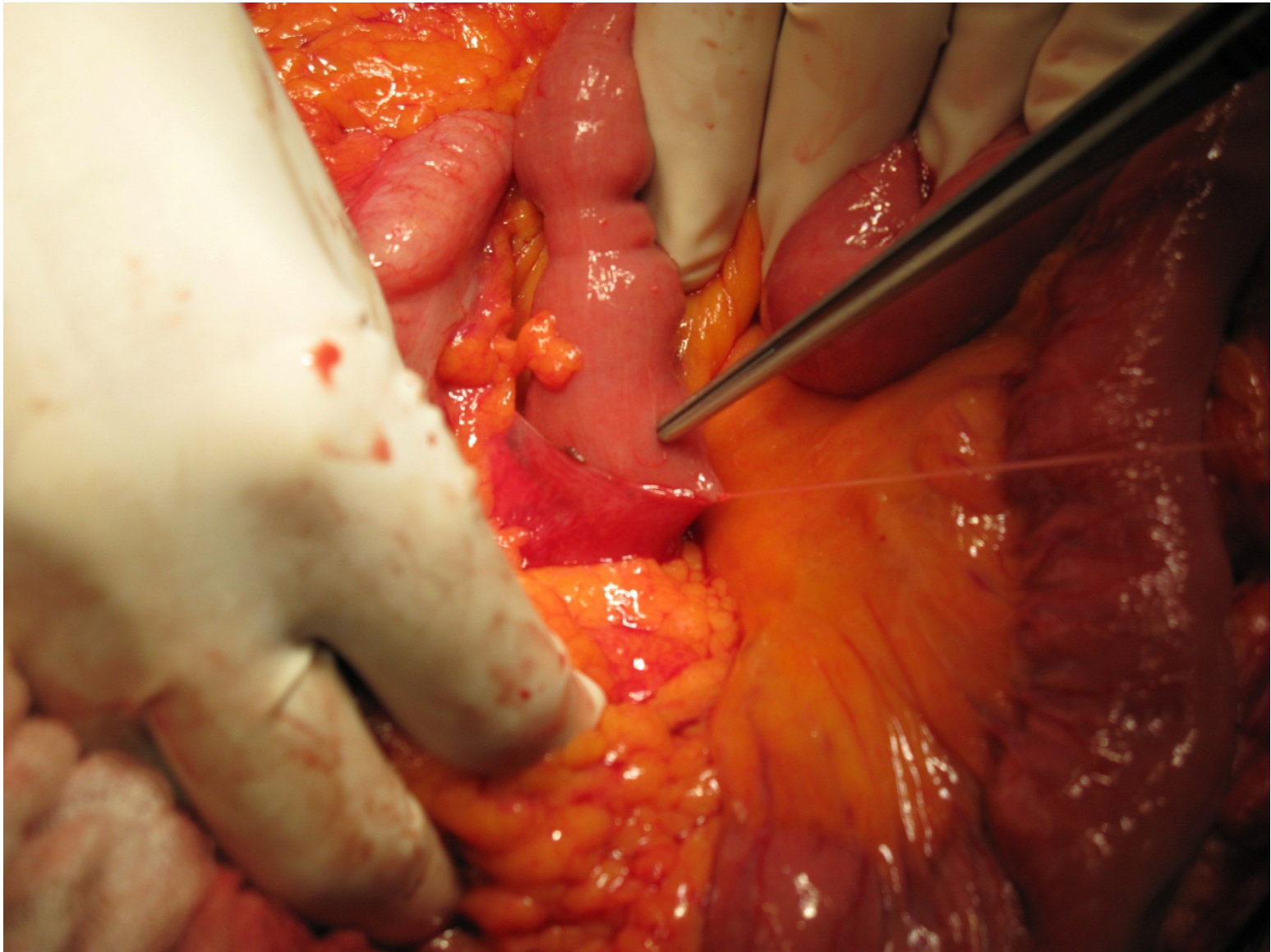




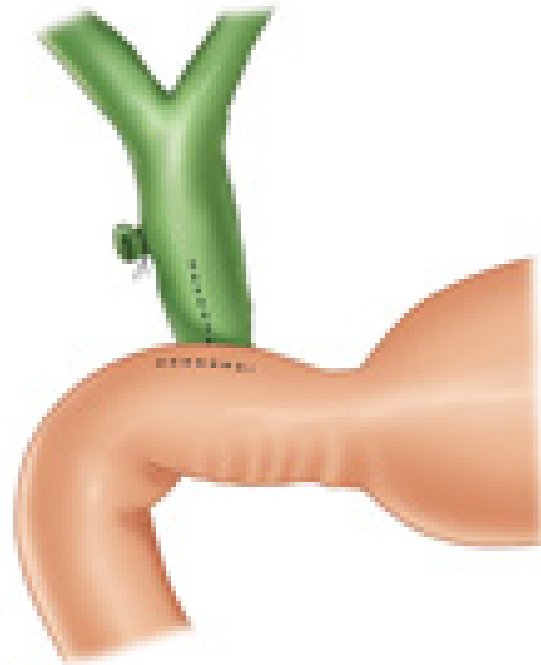








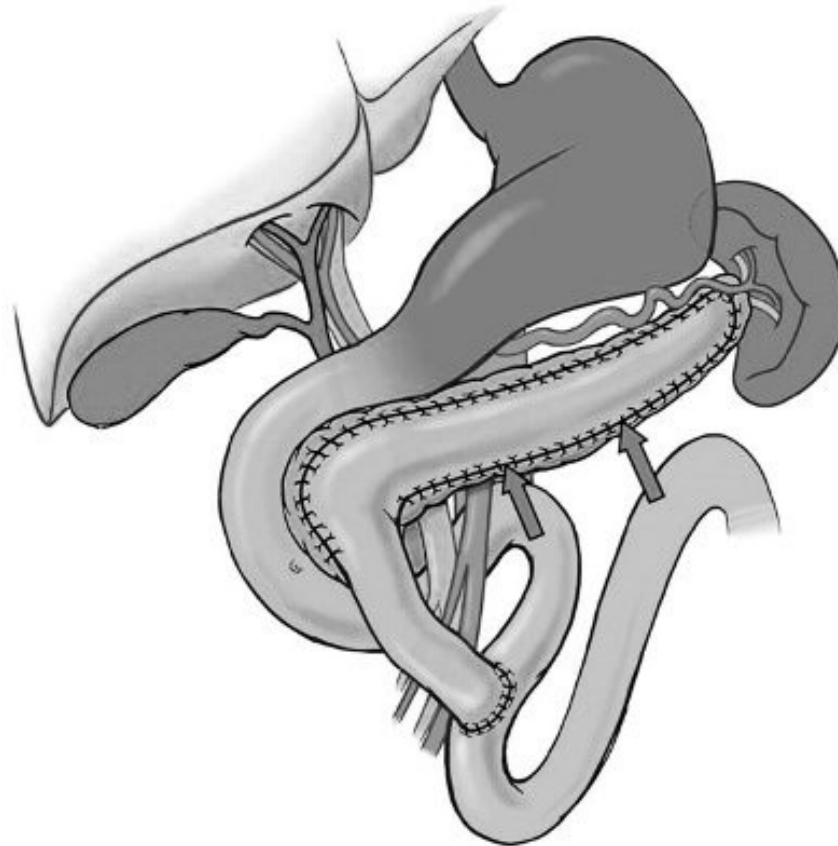
Choledocho-duodeno anastomosis



A



Pancreato-jejuno anastomosis sec. Partington-Rochelle



Pseudocysto-gastro anastomosis

sec. Jurasz
sec. Jedlička



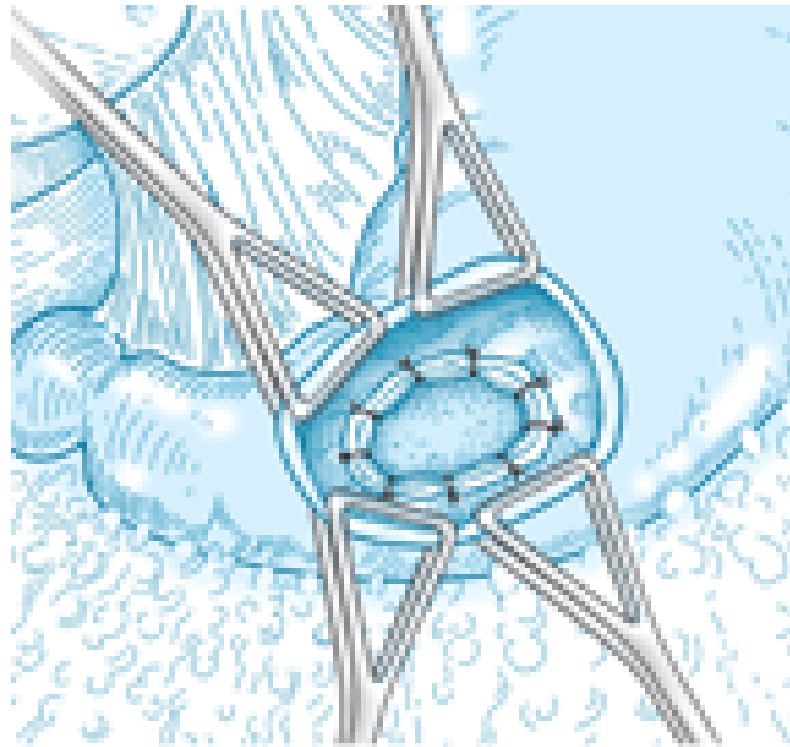
Antoni T. Jurasz
1882-1961



Rudolf Jedlička
1869-1926



Pseudocysto-gastro anastomosis sec. Jurasz



Completion of
pseudocyst-gastrostomy



Incidence of pancreatic pathologies

Acute pancreatitis 54-400 / 100 000

Pancreatic cancer 20 / 100 000

Chronic pancreatitis 5-10 / 100 000

Cystic tumors 2% of all pancreatic malignancies

Pancreatic neuroendocrine tumors 0,32 / 100 000

Pancreatic trauma 0,2% všech traumat

Congenital malformations

Metastases of the tumors of extrapancreatic origin (Grawitz, colorectal cancer and so on.)



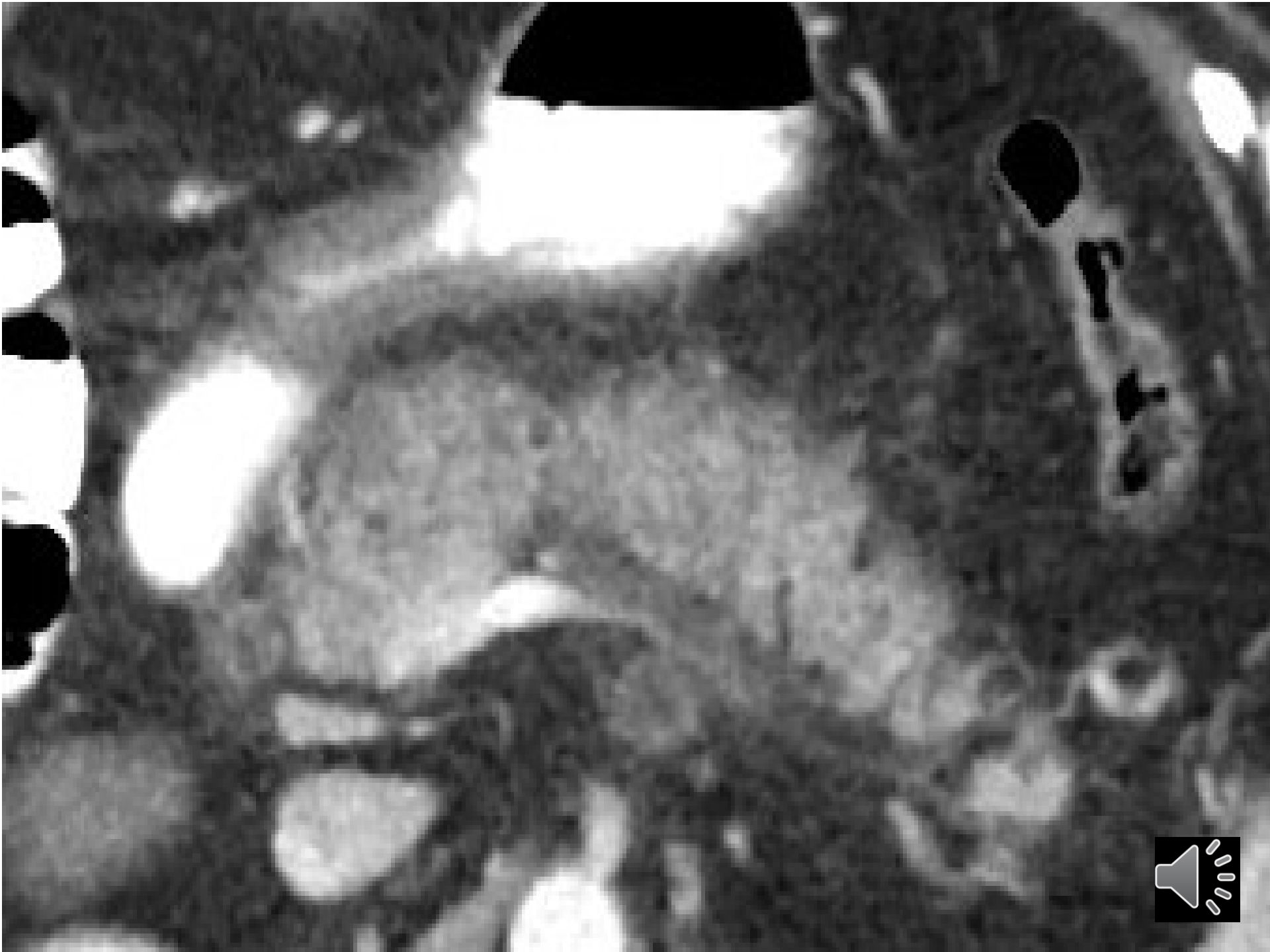
Acute pancreatitis

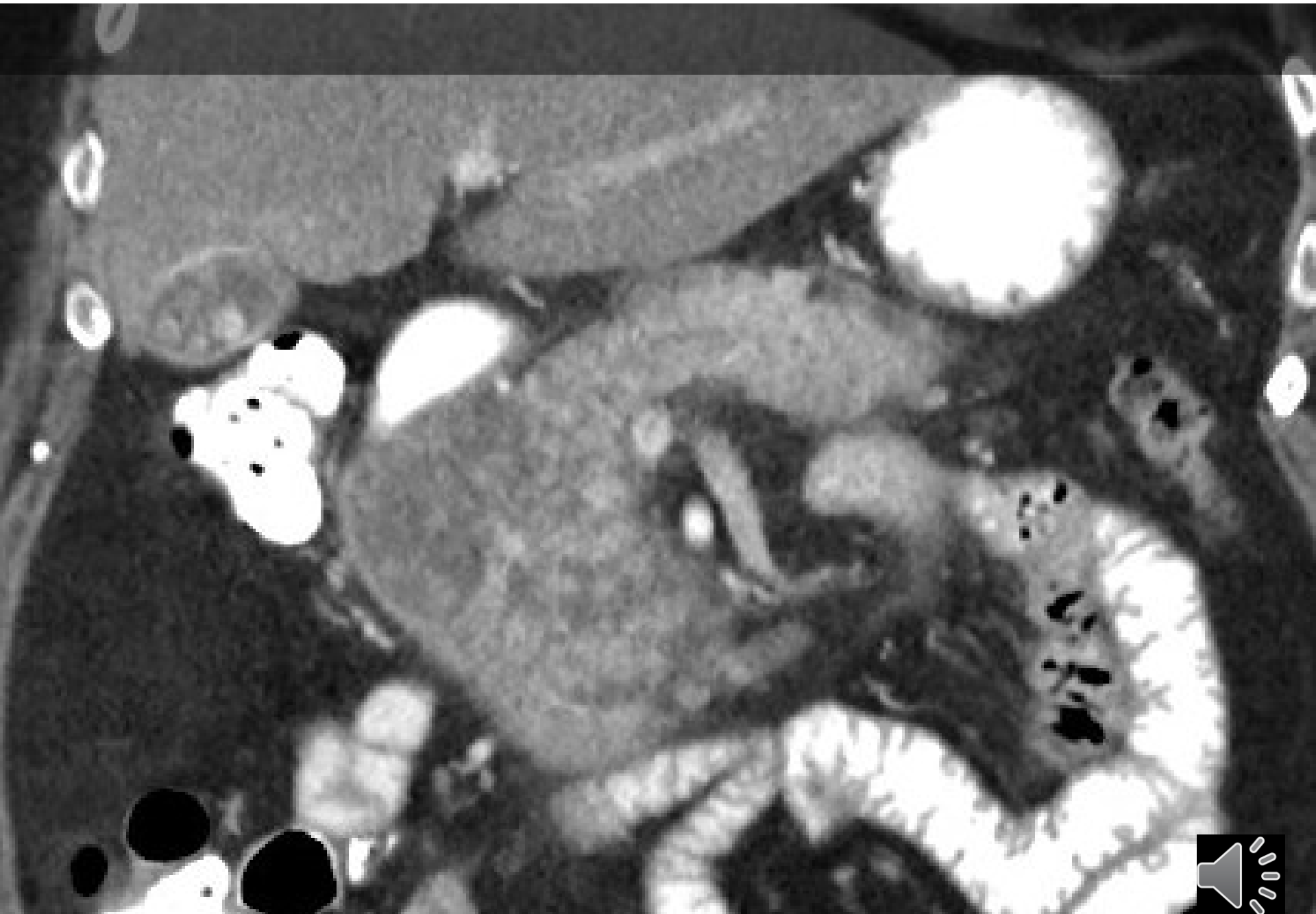
Abdominal pain

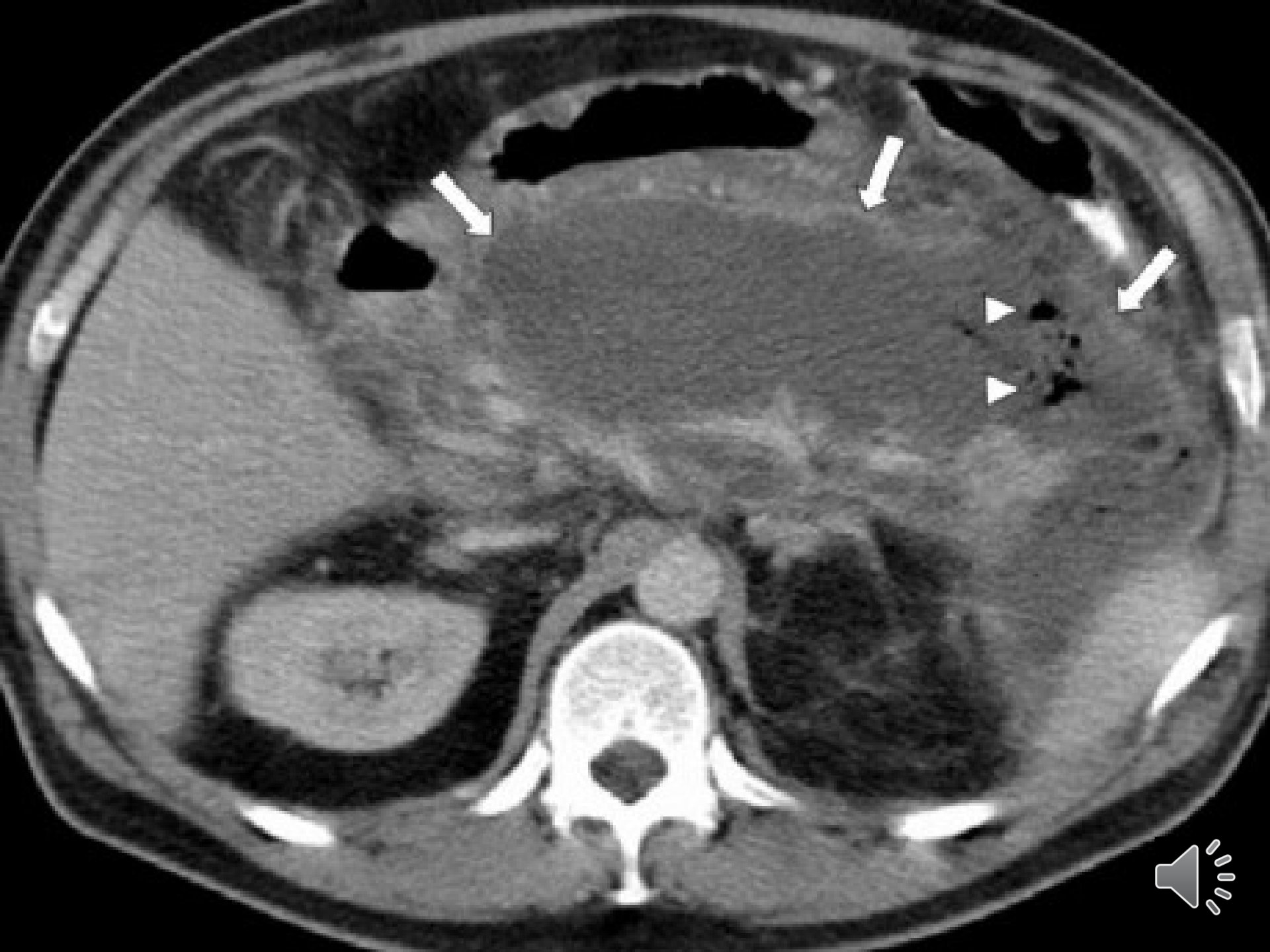
Hyperamylázaemia

CT sings of pancreatitis









Acute pancreatitis etiology

- Biliary
- Toxonutritive (alcoholic)
- Post ERCP



Acute pancreatitis

Clinical signs

- Abdominal pain
- Vomiting
- Fever
- Status subileosus
- Septic shock in severe AP



Acute pancreatitis

Therapy

- Analgetics
- Infusion
- ATB
- Enteral nutrition

- In indicated cases endoscopic, radiological and surgical intervention respectively.

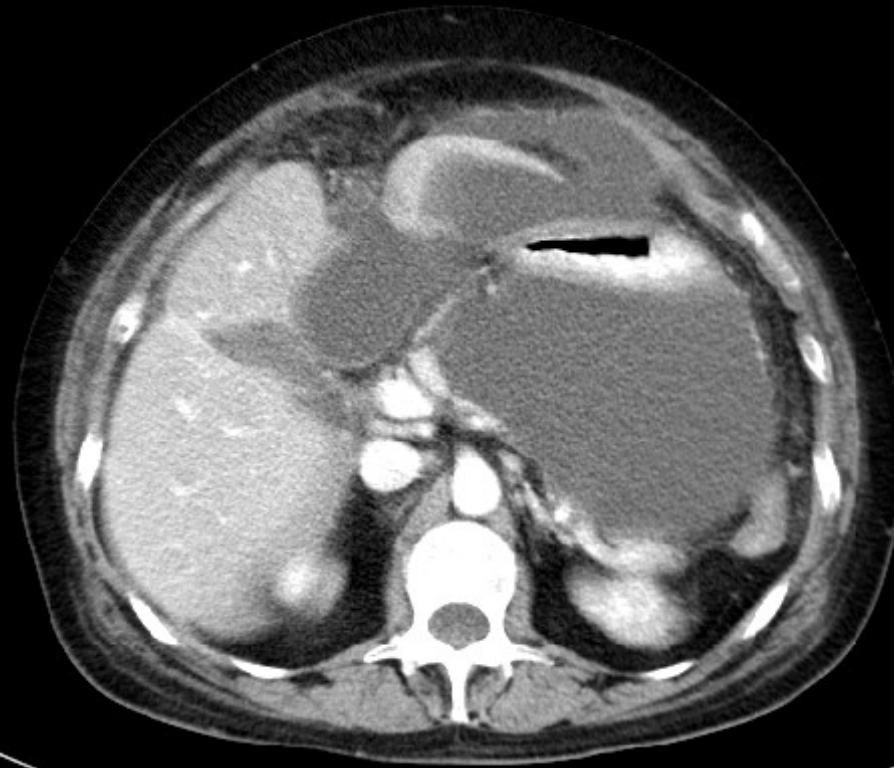


Surgeon solves only the complications of acute pancreatitis

- Surgery in the last possibility of choice, when other methods failed
 - Pancreatic necrosectomy and abdominal lavage
- Early cholecystectomy after mild acute biliary pancreatitis



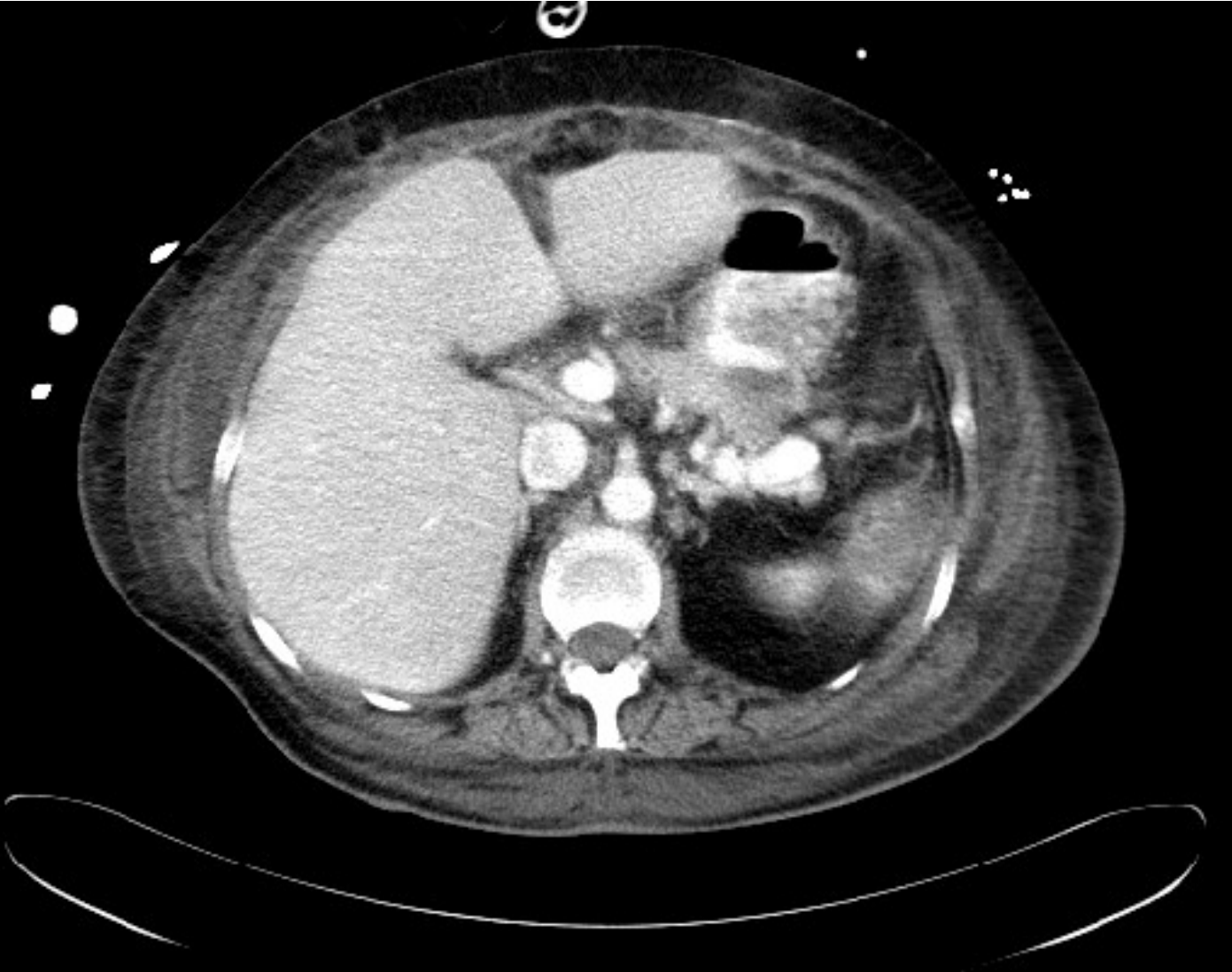
Pancreatic pseudocyst perforated into the abdominal cavity



Pancreatic pseudocyst haemorrhage



One months after Jurasz procedure



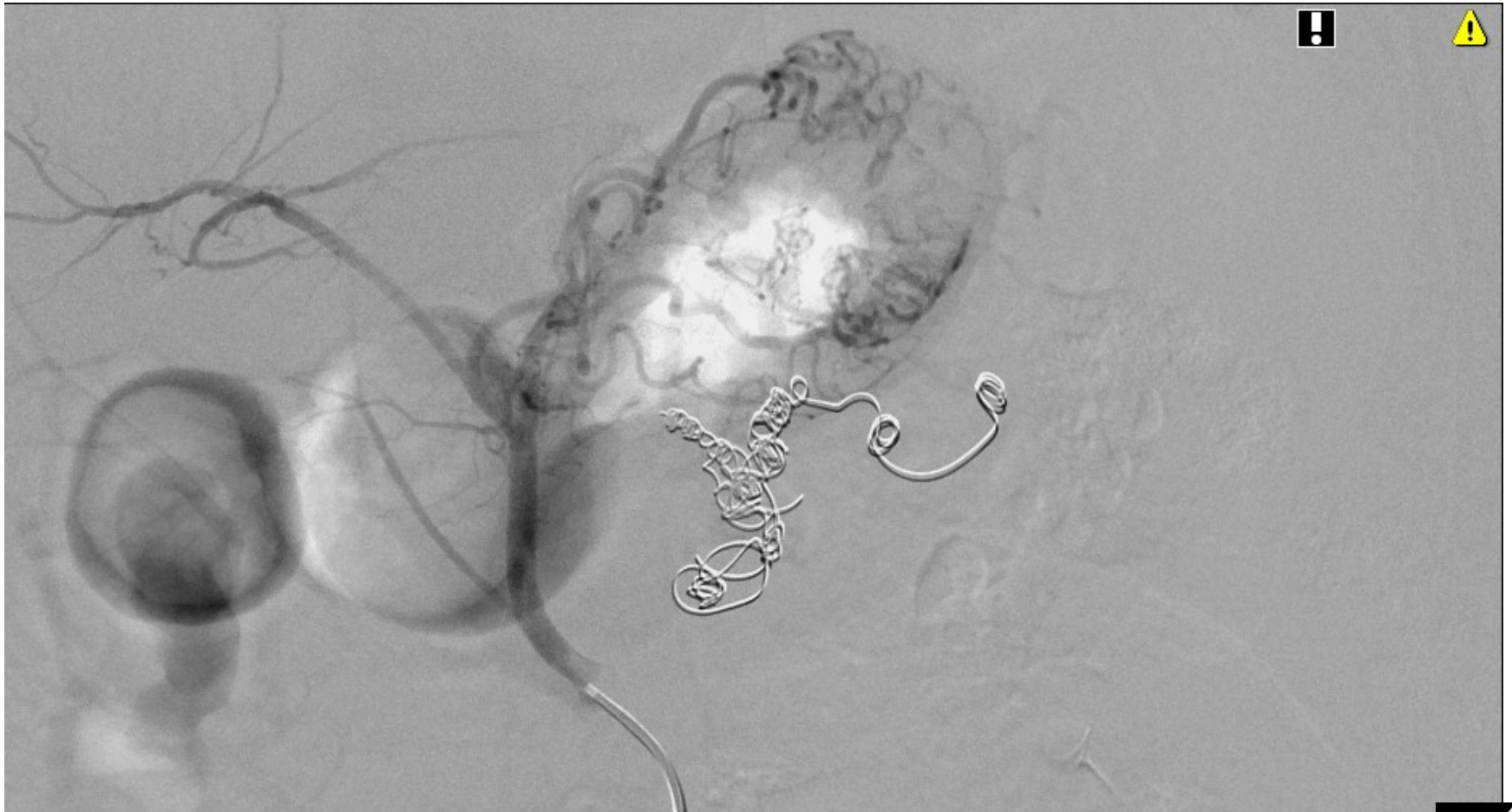
Pseudoaneurysm of lienal artery



Angiography of pseudoaneurism



Embolisation of pseudoaneurysm of splenic artery



CT after embolisation



Literature:

The Atlanta Classification of acute pancreatitis revisited

American Gastroenterological Association Institute Guideline
on Initial Management of Acute Pancreatitis – Gastroenterology



Akutní pankreatitida

Neuroendokrinní nádory pankreatu

Cystické tumory pankreatu

Pancreatic cancer

Chronická pankreatitida

Vrozené vývojové vady

Traumata



Pancreatic cancer

Czech Republic one of the highest incidence worldwide

6.-8. decennium tumor

Late diagnosis (80% nonresectable in the time of diagnosis)

Most-frequently pancreatic head

Jaundice as the first clinical sign

Preoperative biliary drainage is not always necessary

CT as the main imaging method

The only curative method is surgery with adjuvant chemotherapy.

Median overall survival after surgery 20-40%

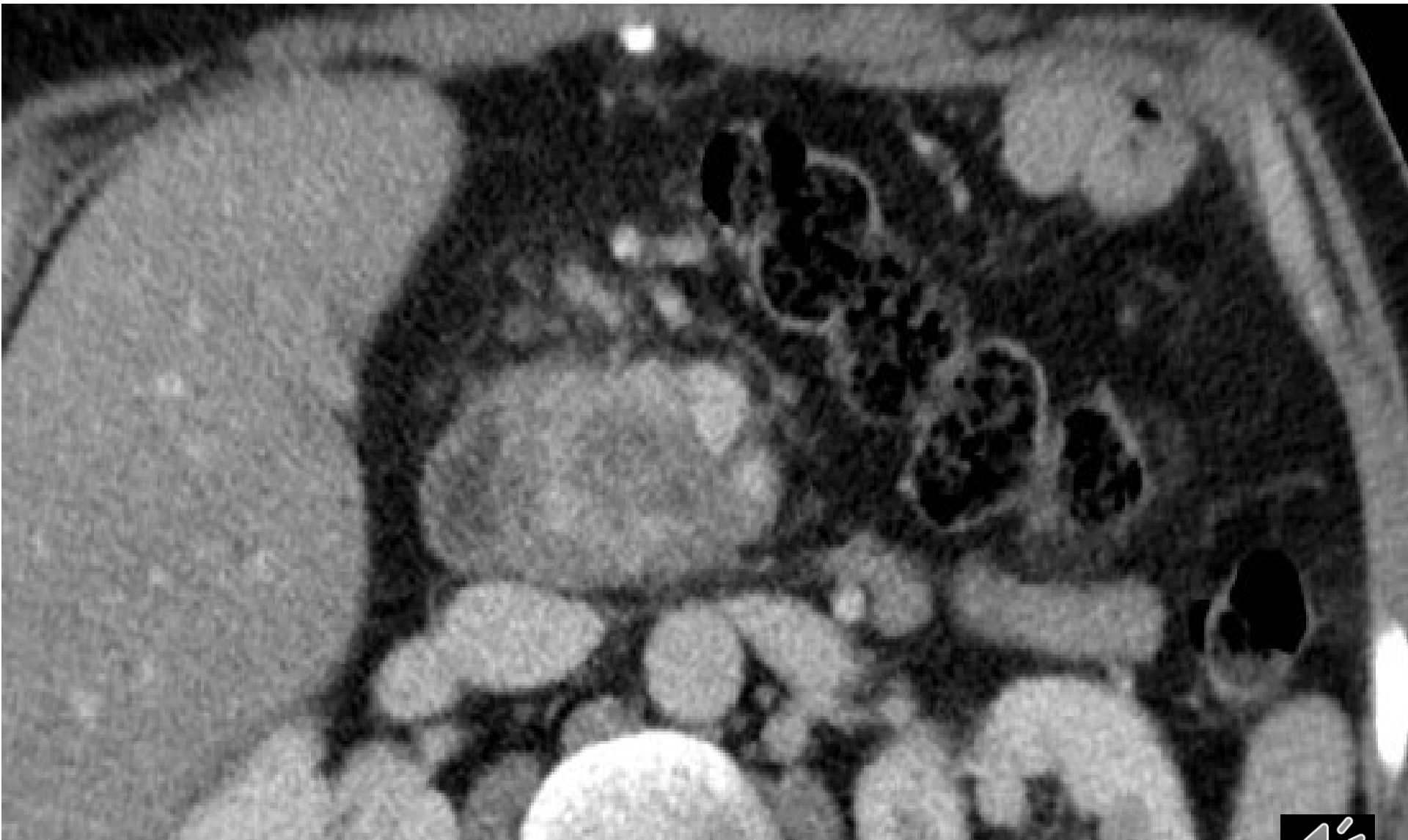


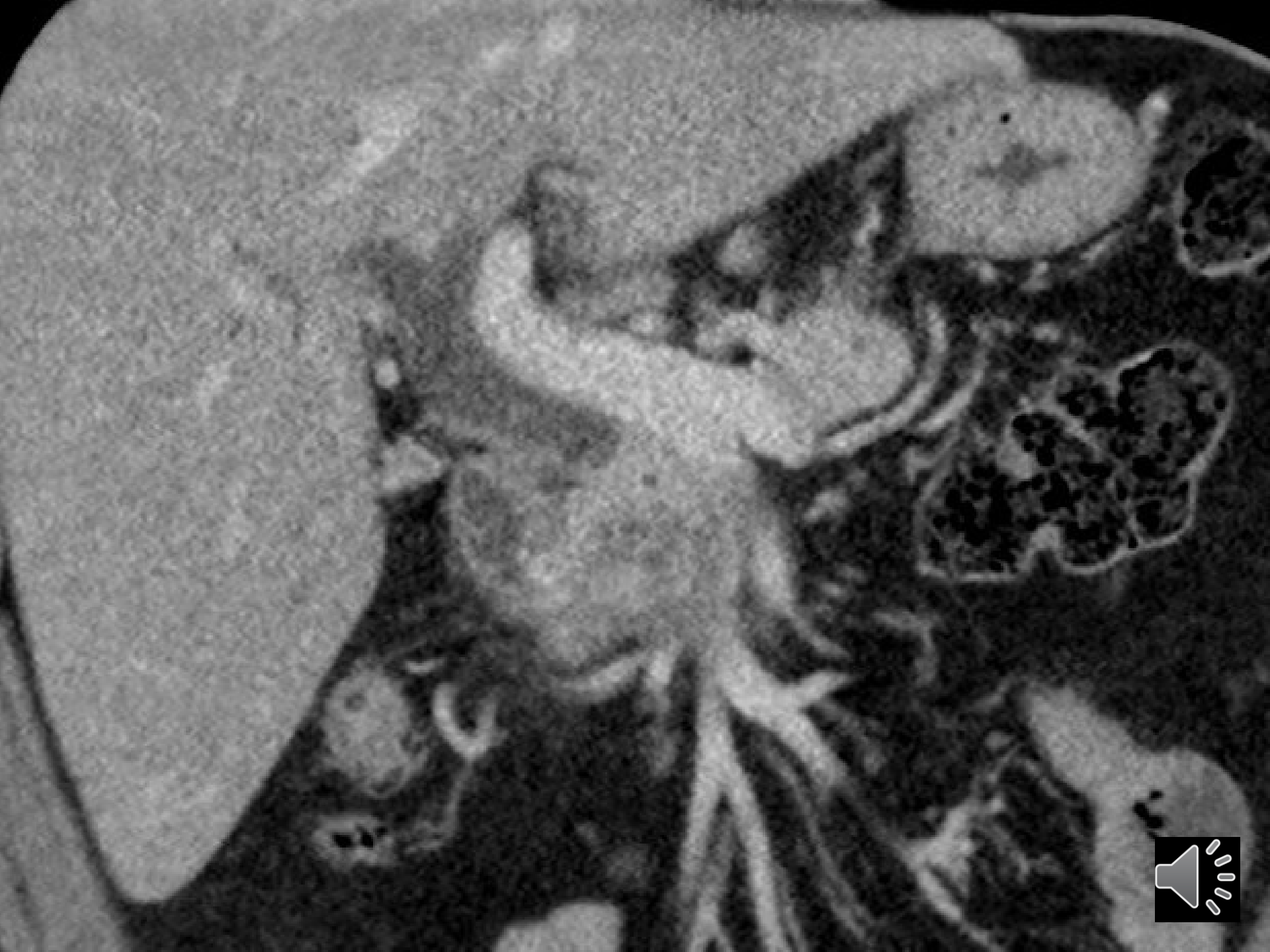
Pancreatic cancer

Clinical signs

- Depending on the tumor localisation!
- Painless jaundice (pancreatic head)
- Back pain are typical for pancreatic body tumors
- Ascites as the sign of peritoneal dissemination







Therapy

- The only curative method is R0 resection with adjuvant Chemotherapy..
- Recently neoadjuvant chemotherapy is suggested



Literature

NCCN guidelines

ESMO guidelines

Japanese Pancreatic Society guidelines



Chronic pancreatitis

Progressive pancreatic fibrosis

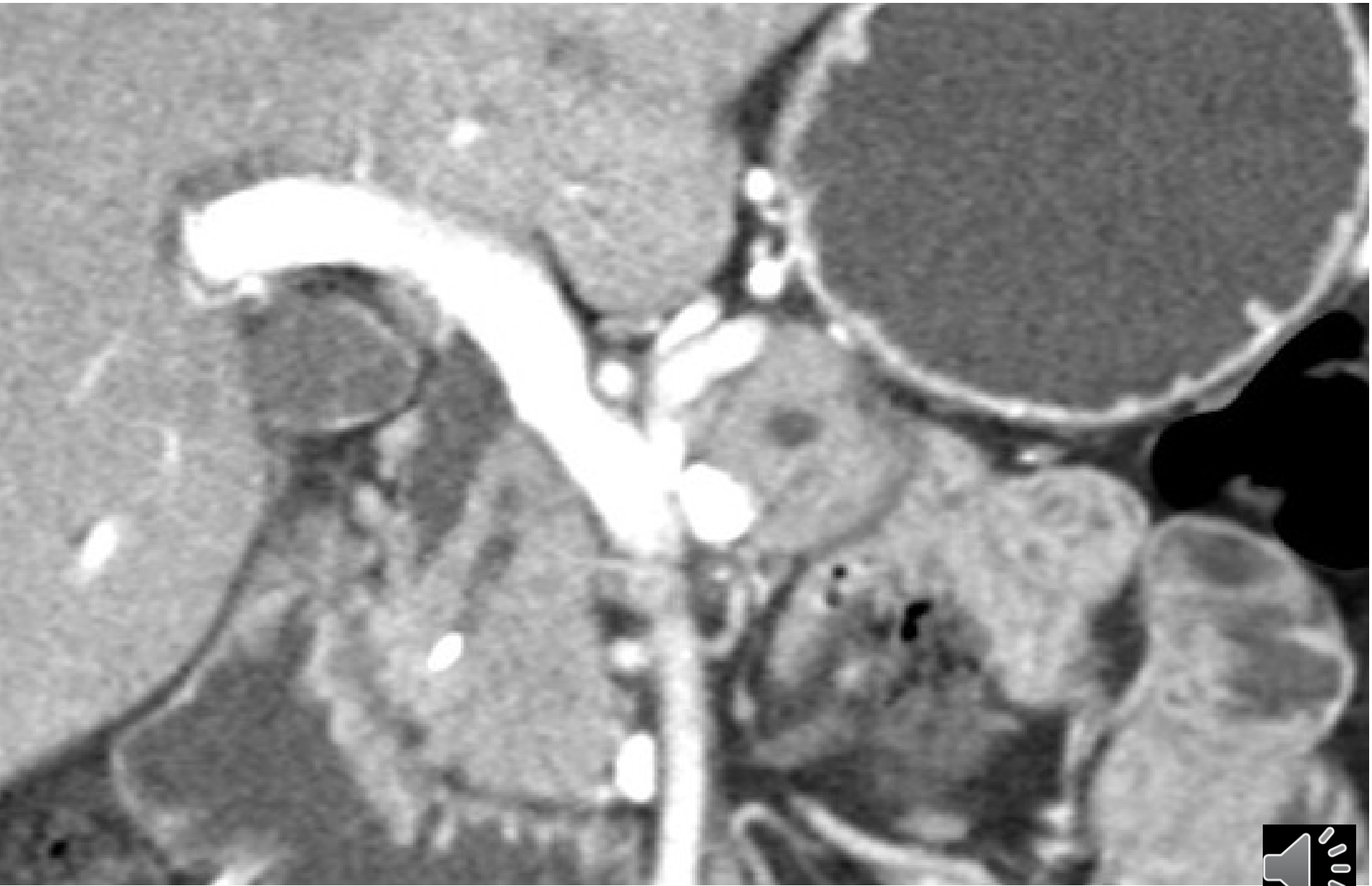
Most oftenly toxonutritive

Surgeon solves the complications:

Obstruction – bypass precodures

Pain – resection or drainage procedures



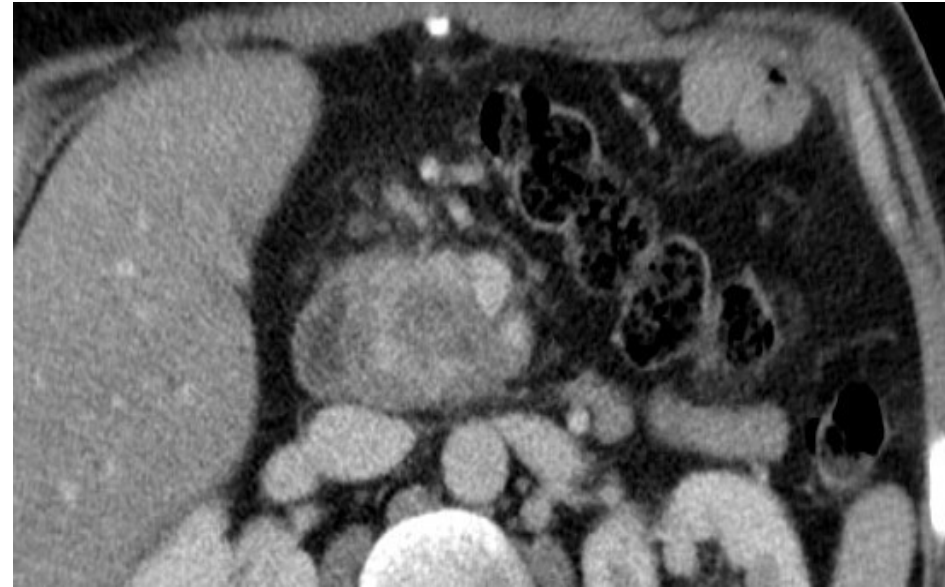
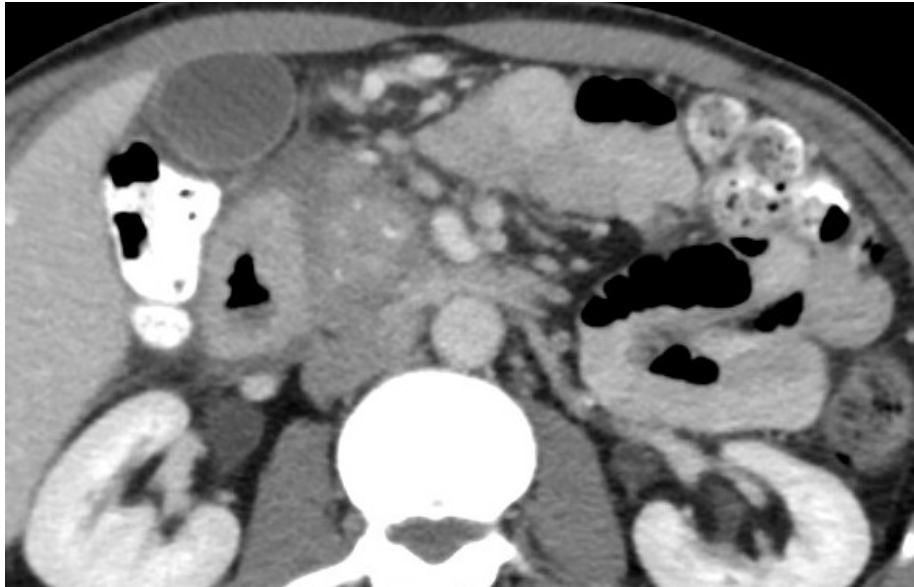


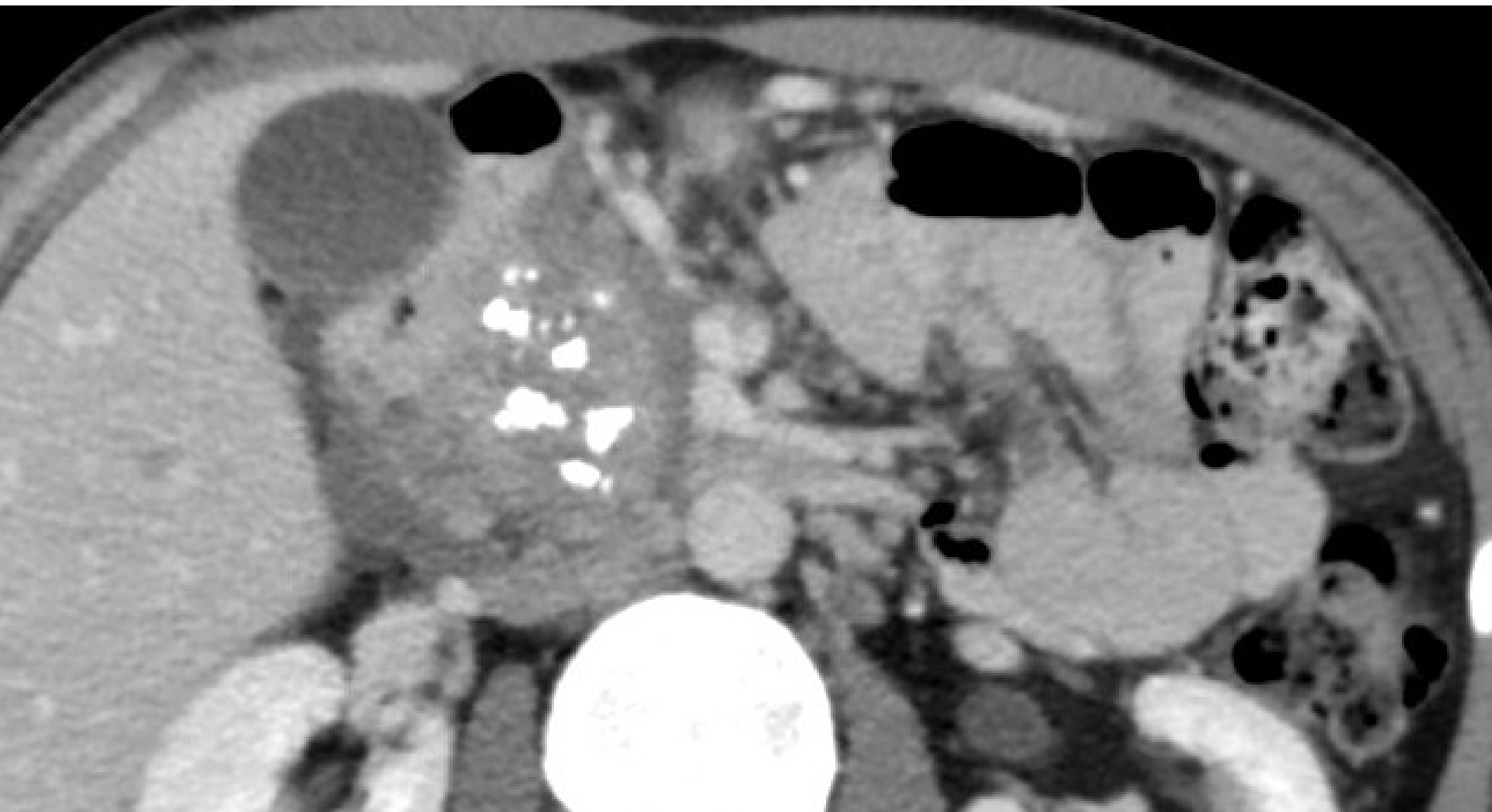
Proble to differentiate

Chronic pancreatitis

vs.

tumor





Literature

United European Gastroenterology evidence based guidelines for diagnosis and therapy of chronic pancreatitis (HaPanEU)



Cystic tumors

With increased number of CT, the cystic tumor incidence rises too.

| | |
|---------------|------|
| under 40 year | 0,5% |
| 70-80 y | 25% |
| nad 80 y | 37% |



Cystic tumor

- Serous cystadenoma (SCA)
- Mucinosc cystic neoplasia (MCN)
- Intraductal papillary mucinous neoplasia (IPMN)
- Solid pseudopapillary tumor (SPT)



The problem of pseudocyst and cystic tumor differentiation

Acute or chronic pancreatitis in anamnesis show more probably to pseudocyst.

In case of cystic tumor, resection is considered

Prognosis is much more better than in pancreatic cancer



Serous cystadenoma

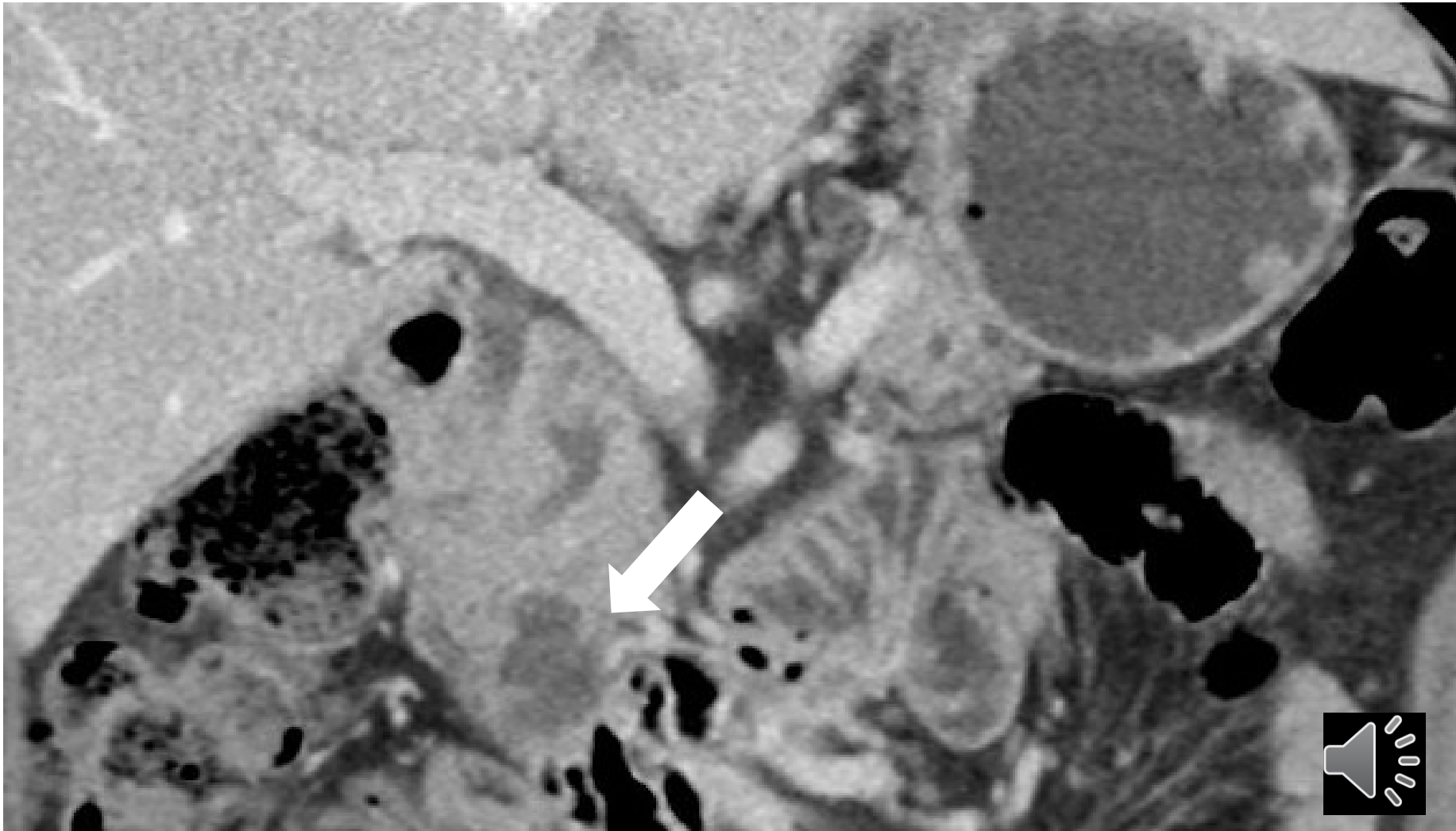


Mucinous cystic neoplasm

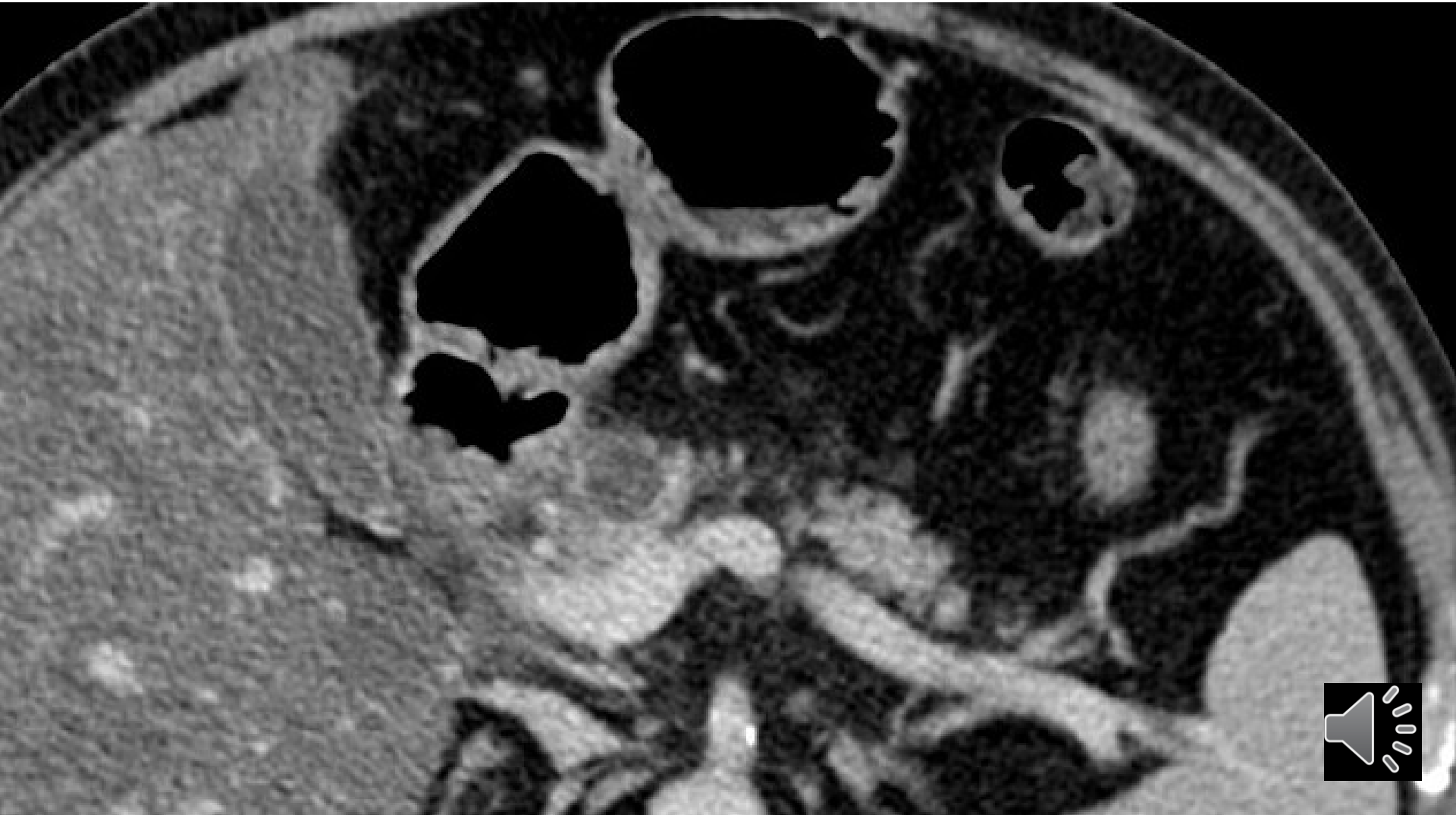


IPMN

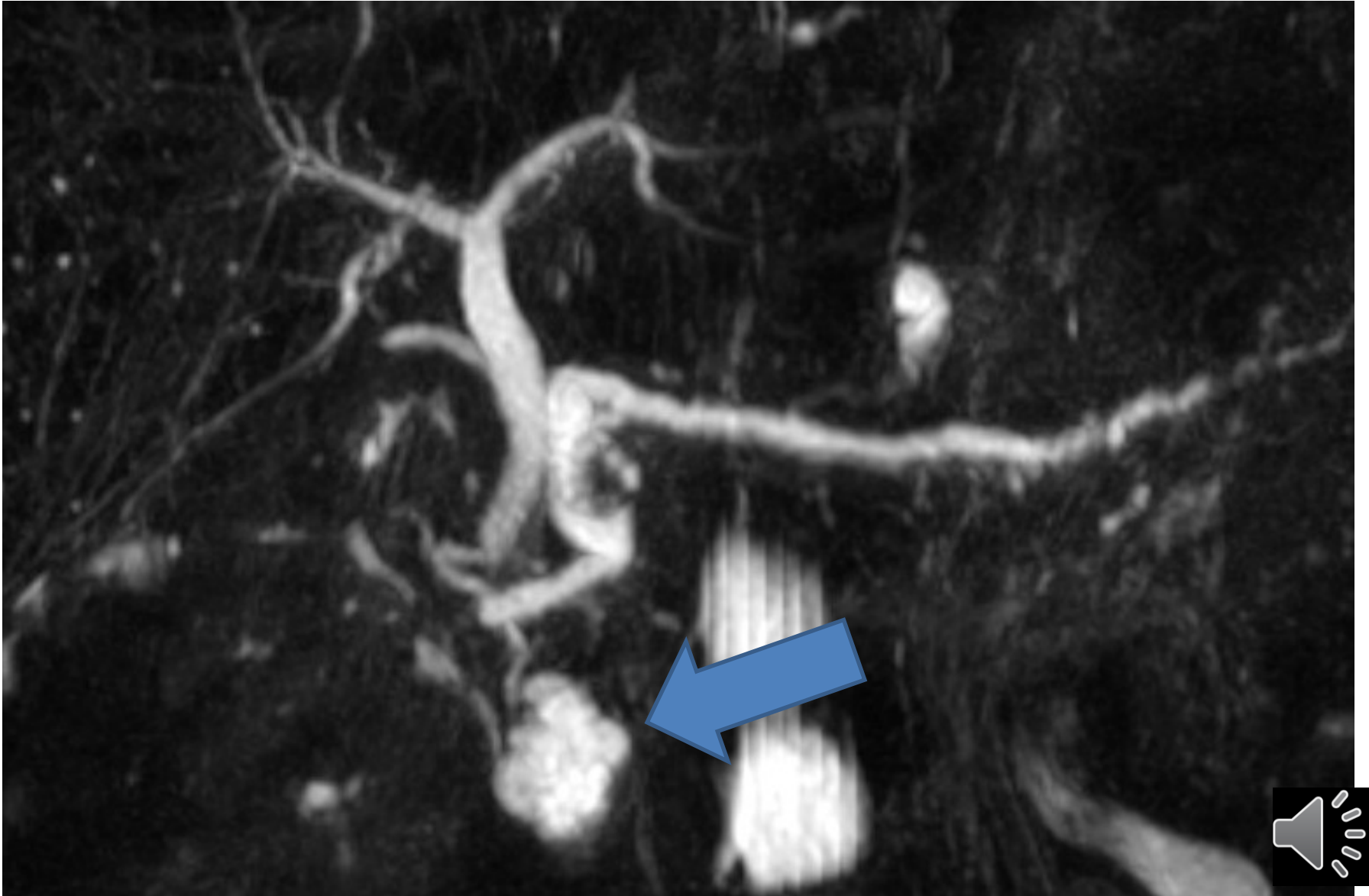
intraductal papillary mucinous neoplasy



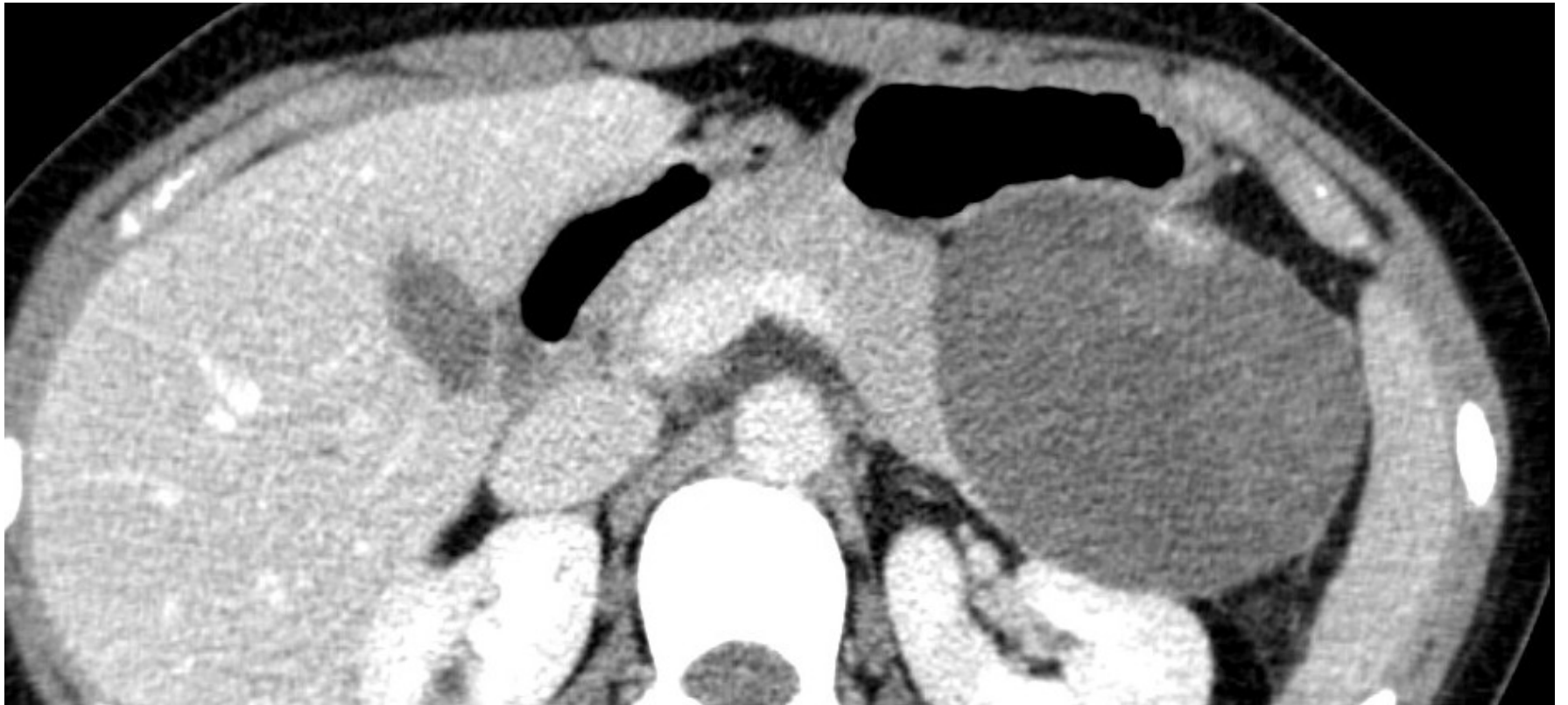
IPMN



MRCP

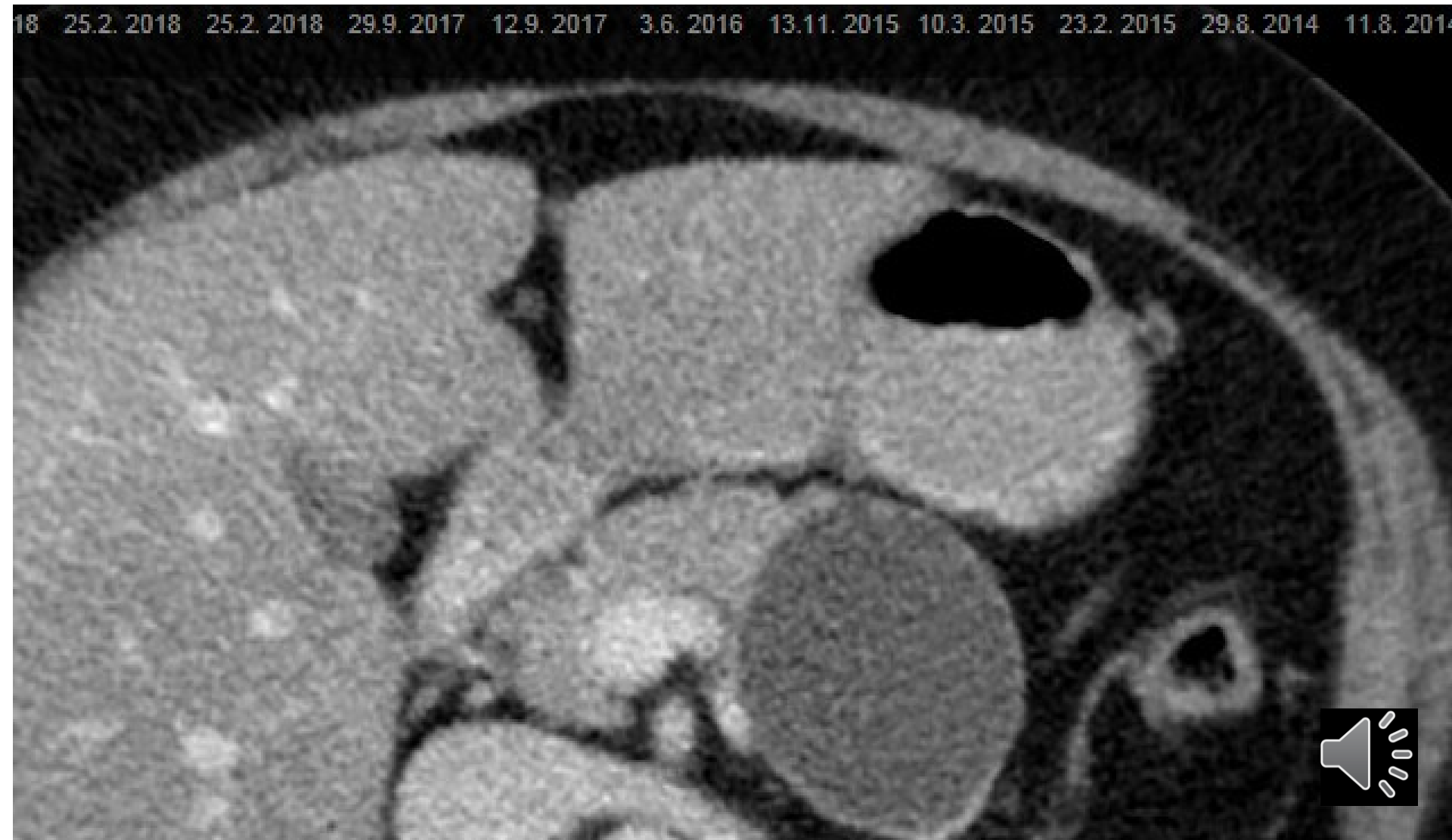


Solid pseudopapillary tumor



Pseudocyst

18 25.2.2018 25.2.2018 29.9.2017 12.9.2017 3.6.2016 13.11.2015 10.3.2015 23.2.2015 29.8.2014 11.8.2014



Neuroendocrine tumors

They are rare

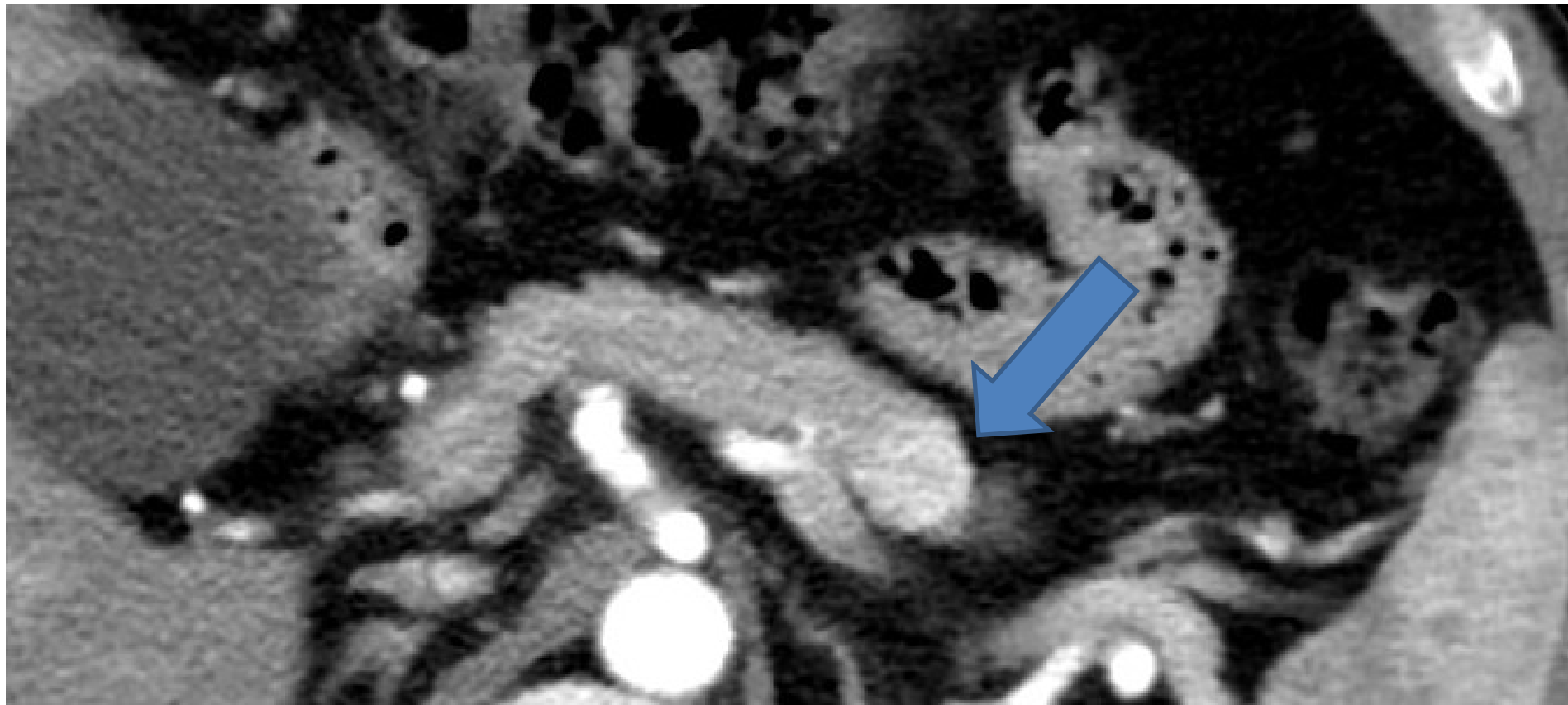
Some of them produce hormones (insulin etc.)

Mostly indicated for resection except that ones with the diameter lower than 2cm.

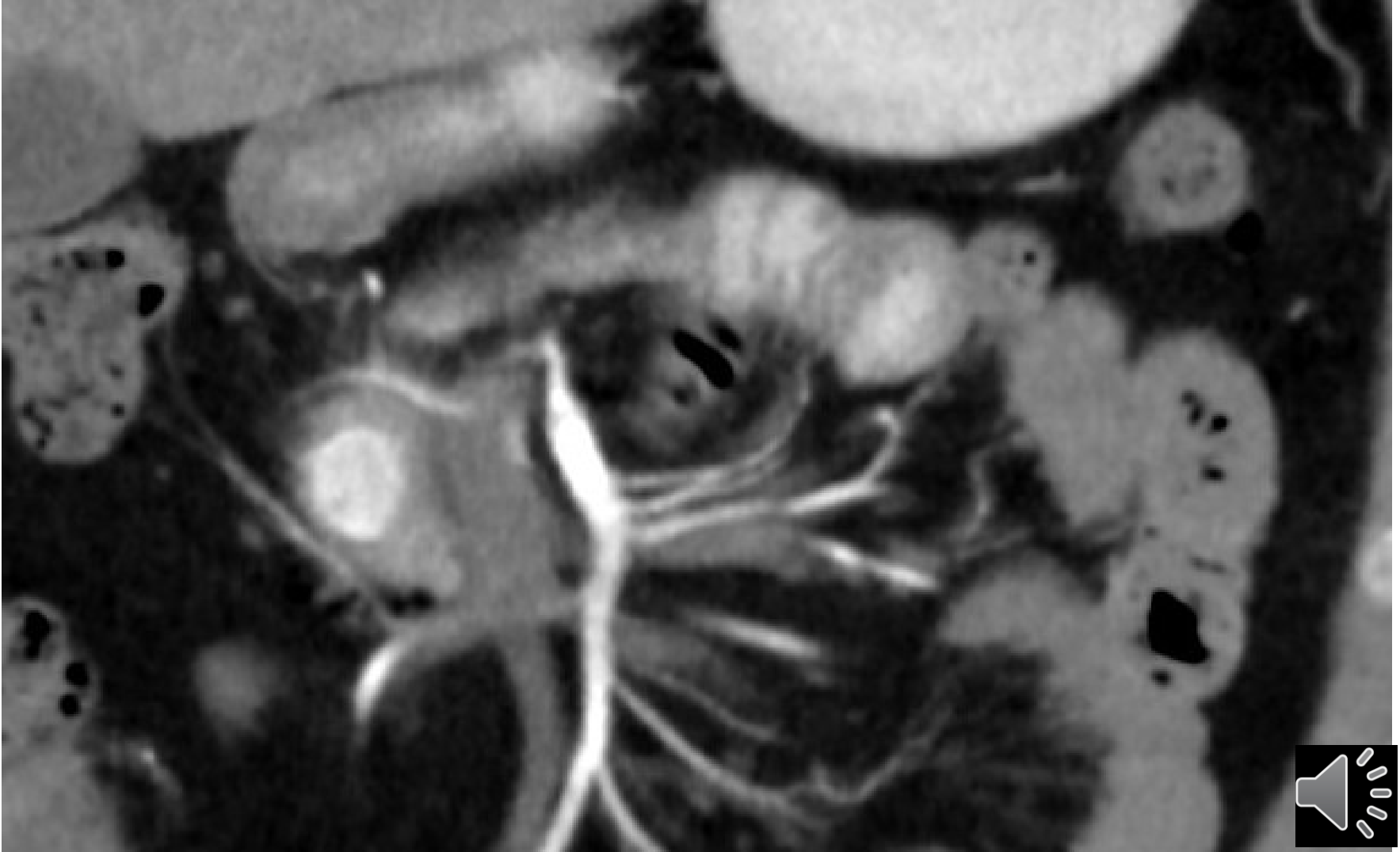
Surgery is considered also in the case of distant metastases.



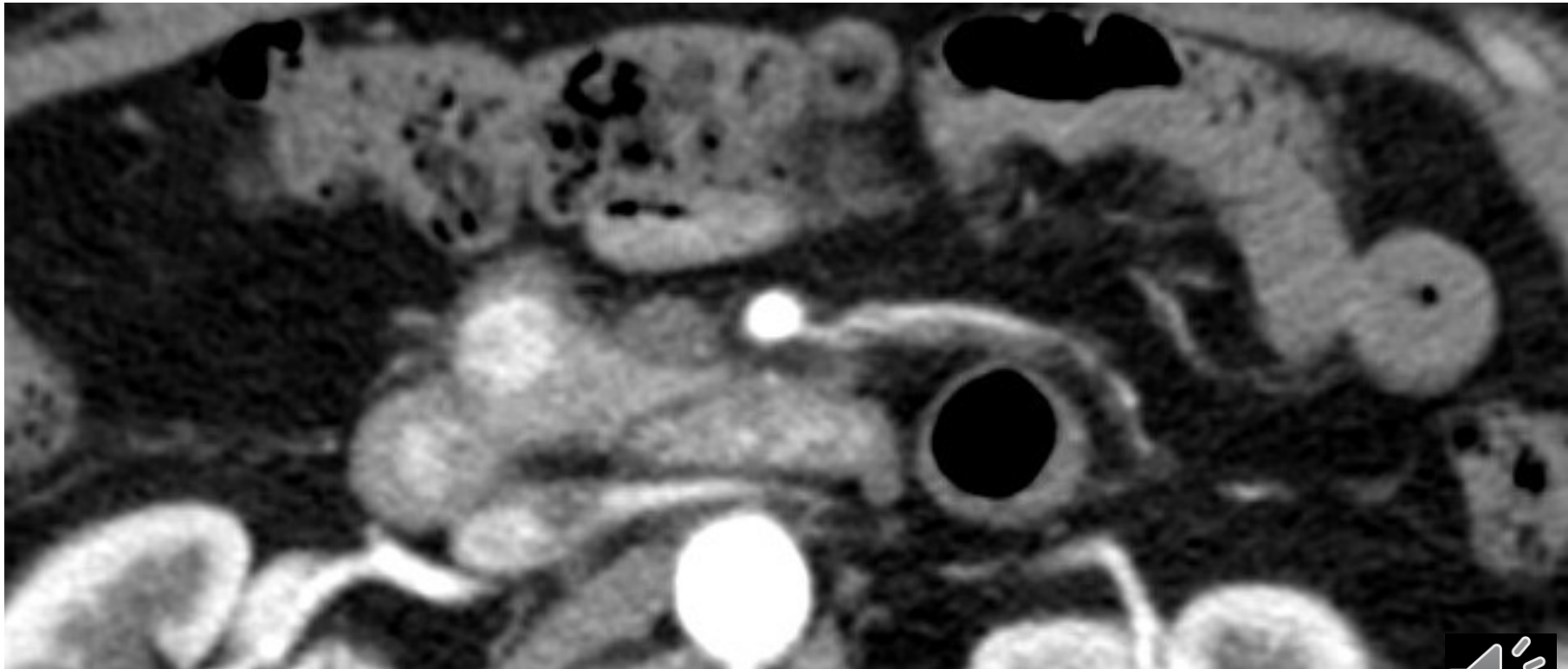
Pancreatic tail insulinoma



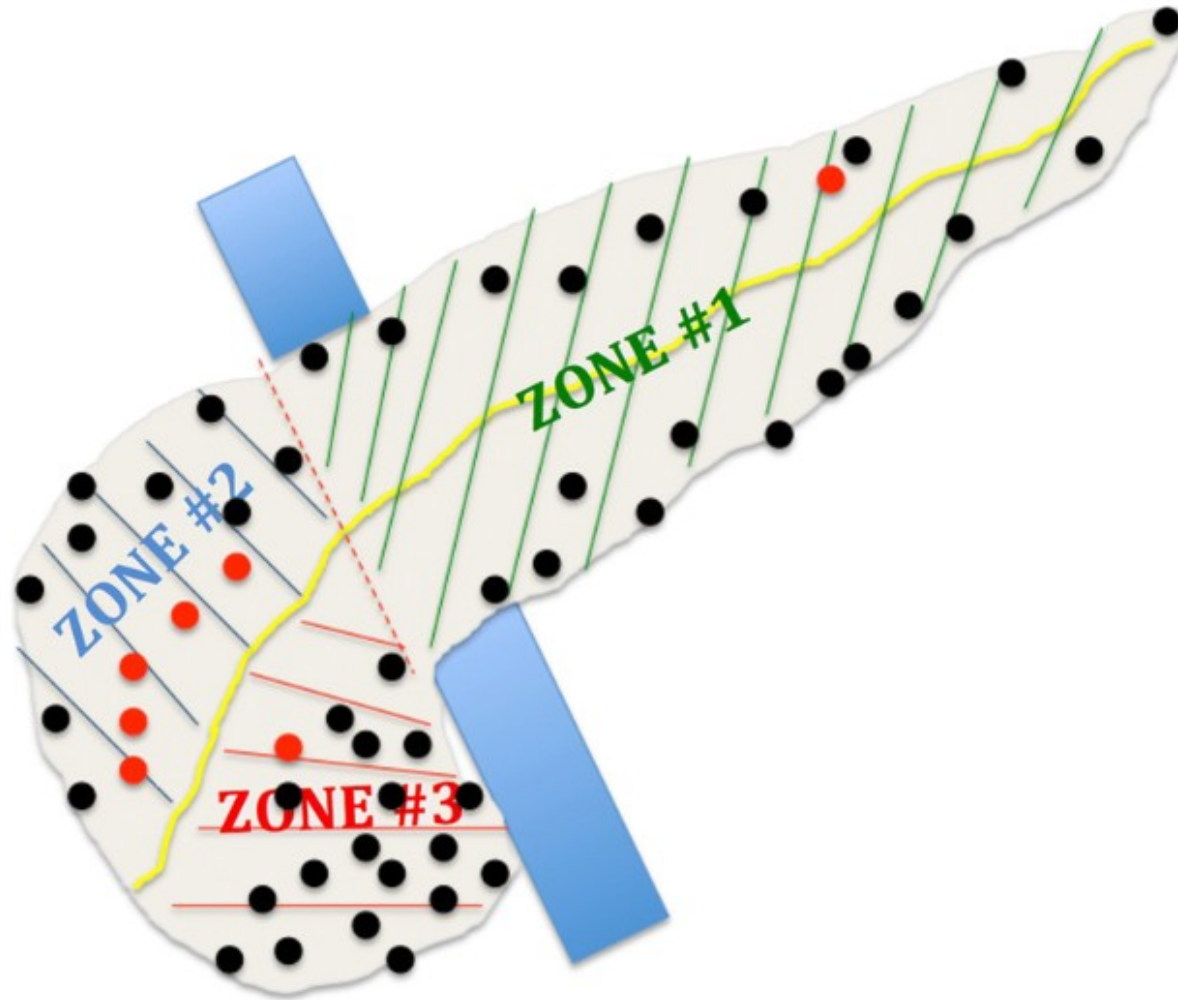
Pancreatic head insulinoma



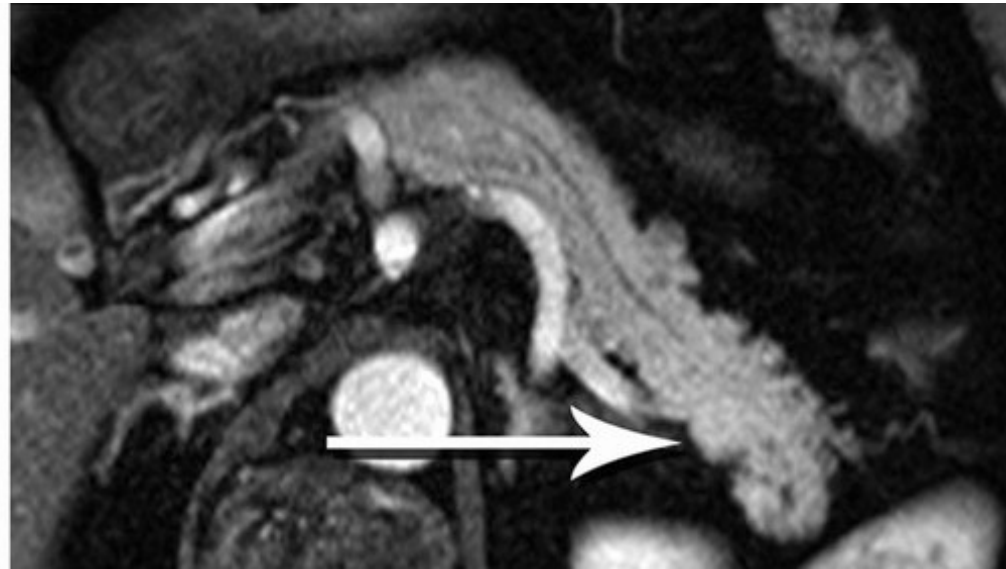
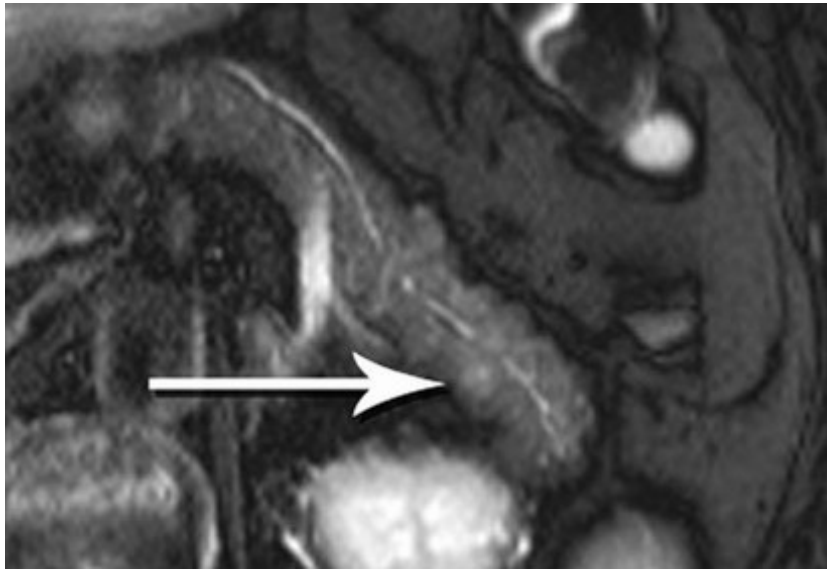
Pancreatic head Insulinoma

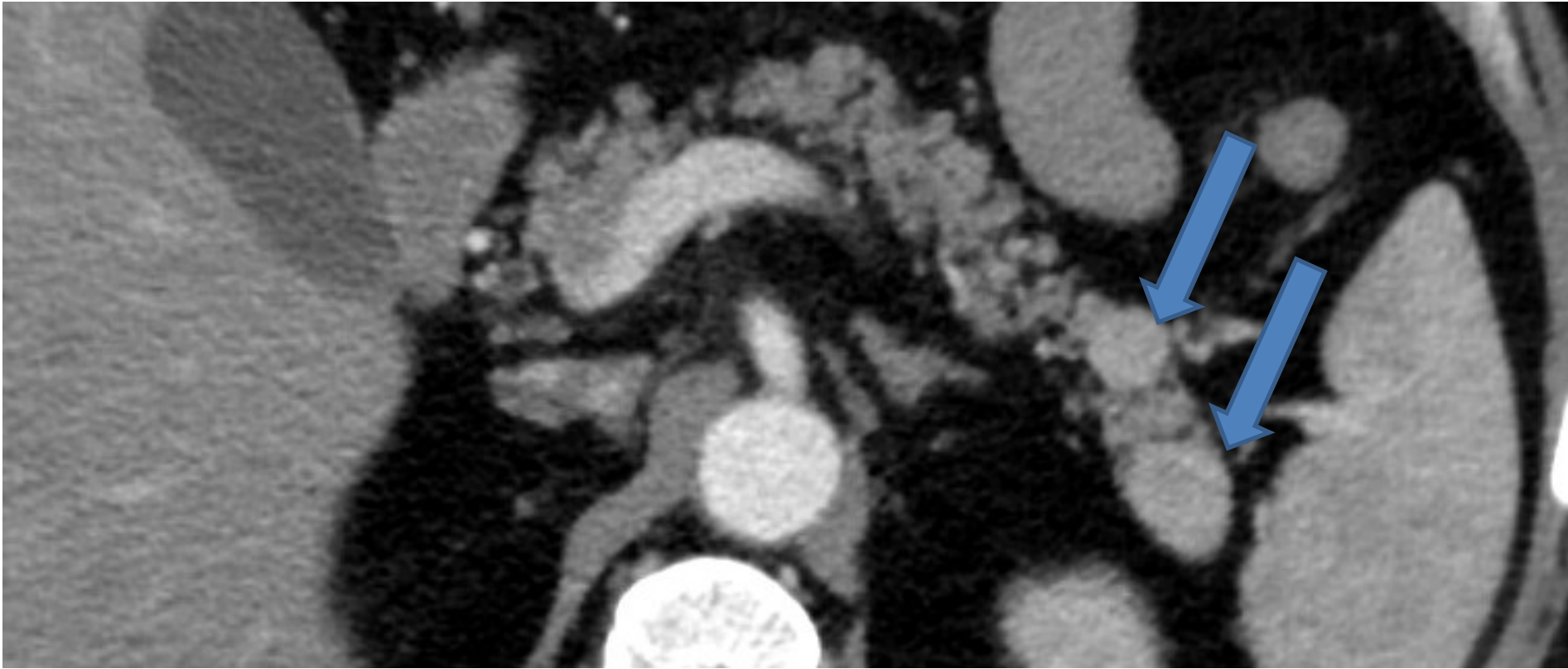


Risk of postoperative pancreatic fistula



MRCPC for the relationship to Wirsung duct

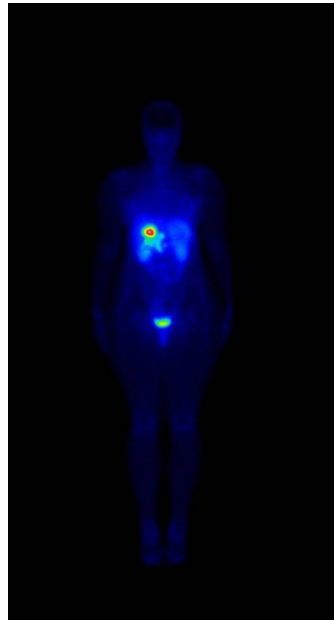


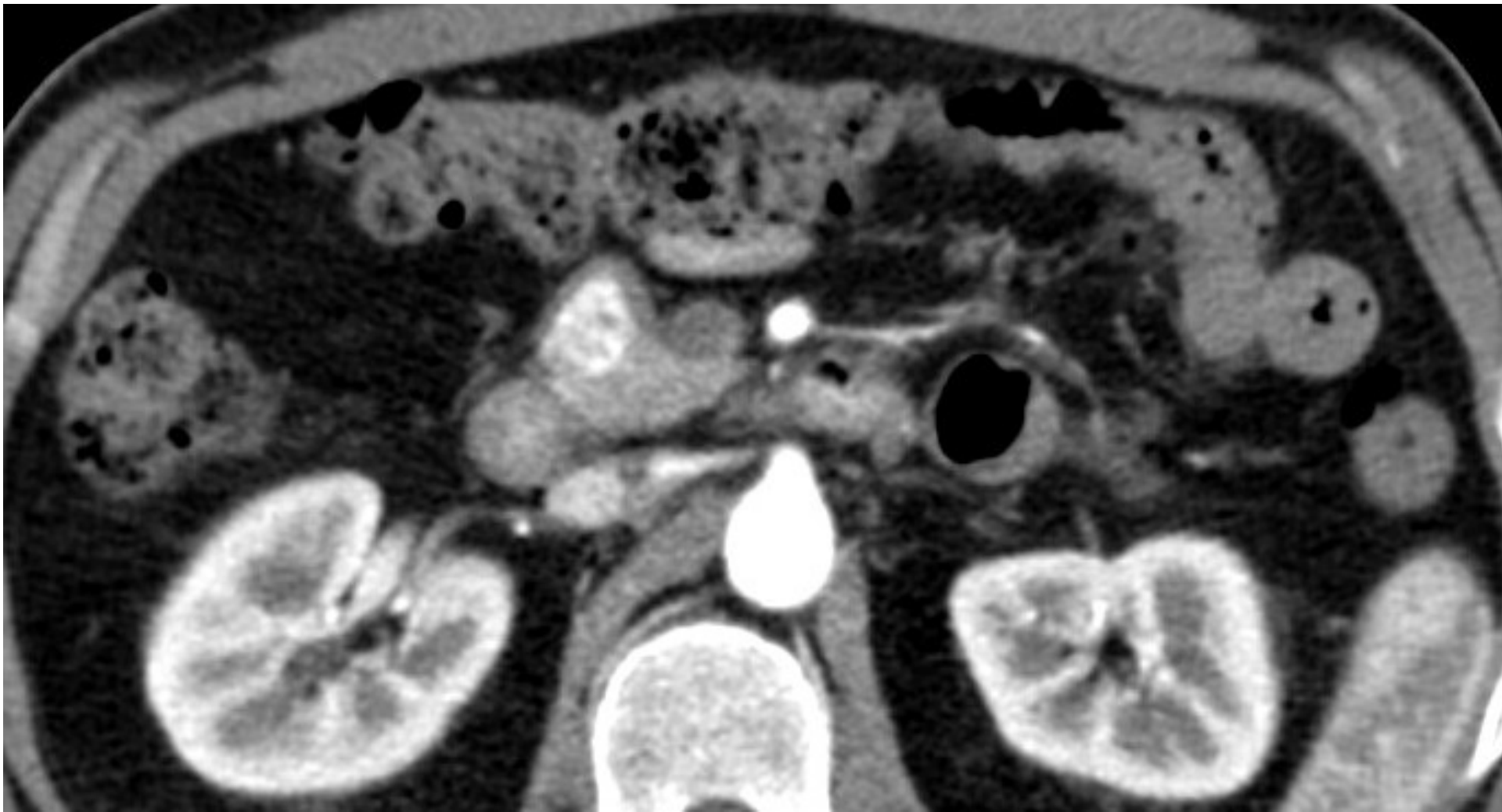


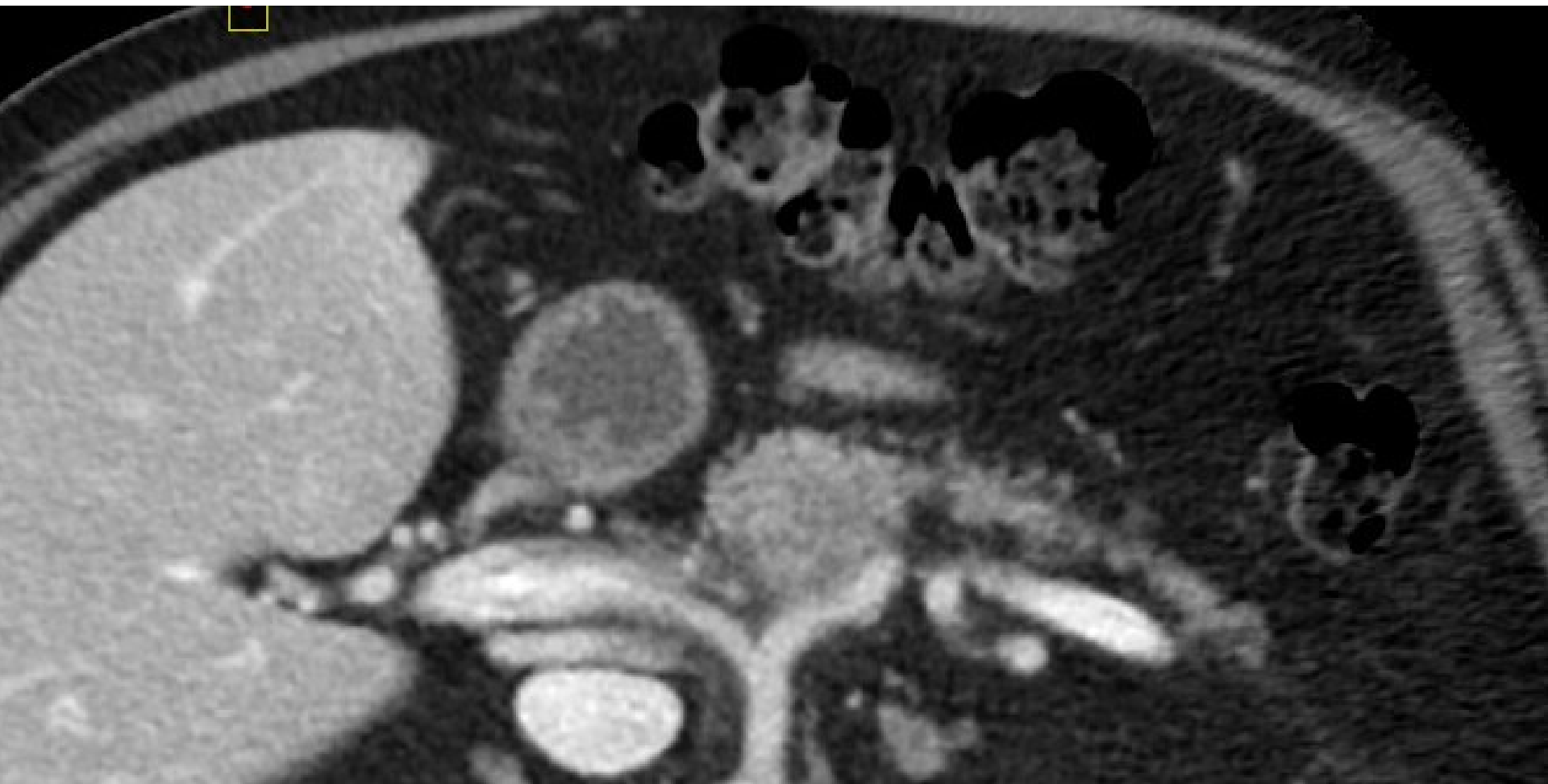


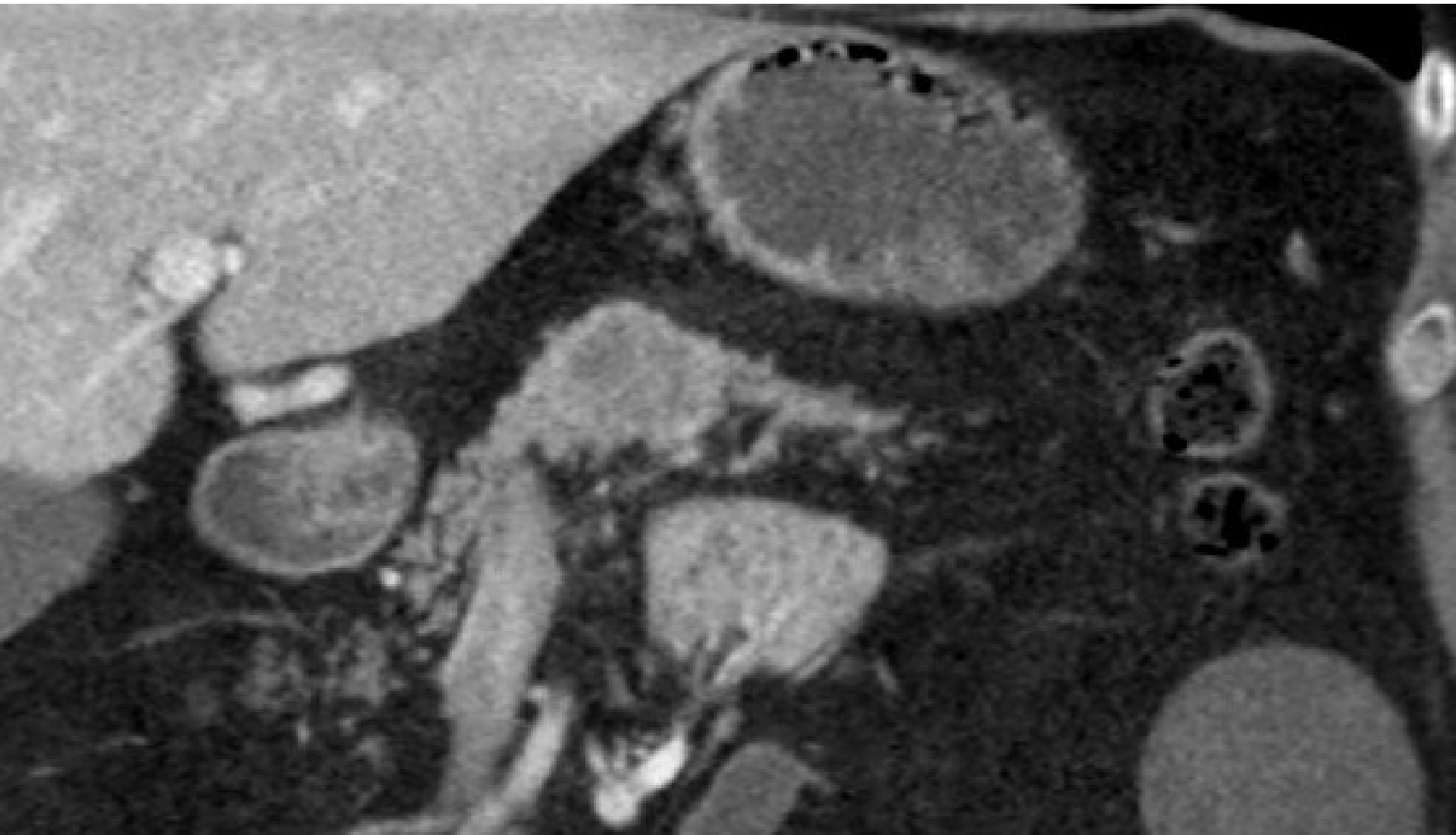
Octreoscan

Shows the tumors with somatostatin receptors









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RESEARCH

ABOUT US

ENETS
GUIDELINES

GRANTS AND
AWARDS

CENTERS OF
EXCELLENCE

NET NURSE



Welcome to the European Neuroendocrine Tumor Society

Neuroendocrine tumors (NETs) present numerous complex clinical problems. Due to their relatively rare occurrence, research and patient care guidelines since the 1990s have been lacking. As a result, the European Neuroendocrine Tumor Society was founded in 2004 and the society members, currently numbering nearly 1,400, bring a variety of expertise from such fields as oncology, pathology, radiology, nuclear medicine, endocrinology, surgery and gastroenterology to ENETS.

16TH ANNUAL ENETS CONFERENCE 2019

ENETS CONFERENCE WEBCASTS

ENETS RESEARCH



The 16h Annual ENETS Conference will take

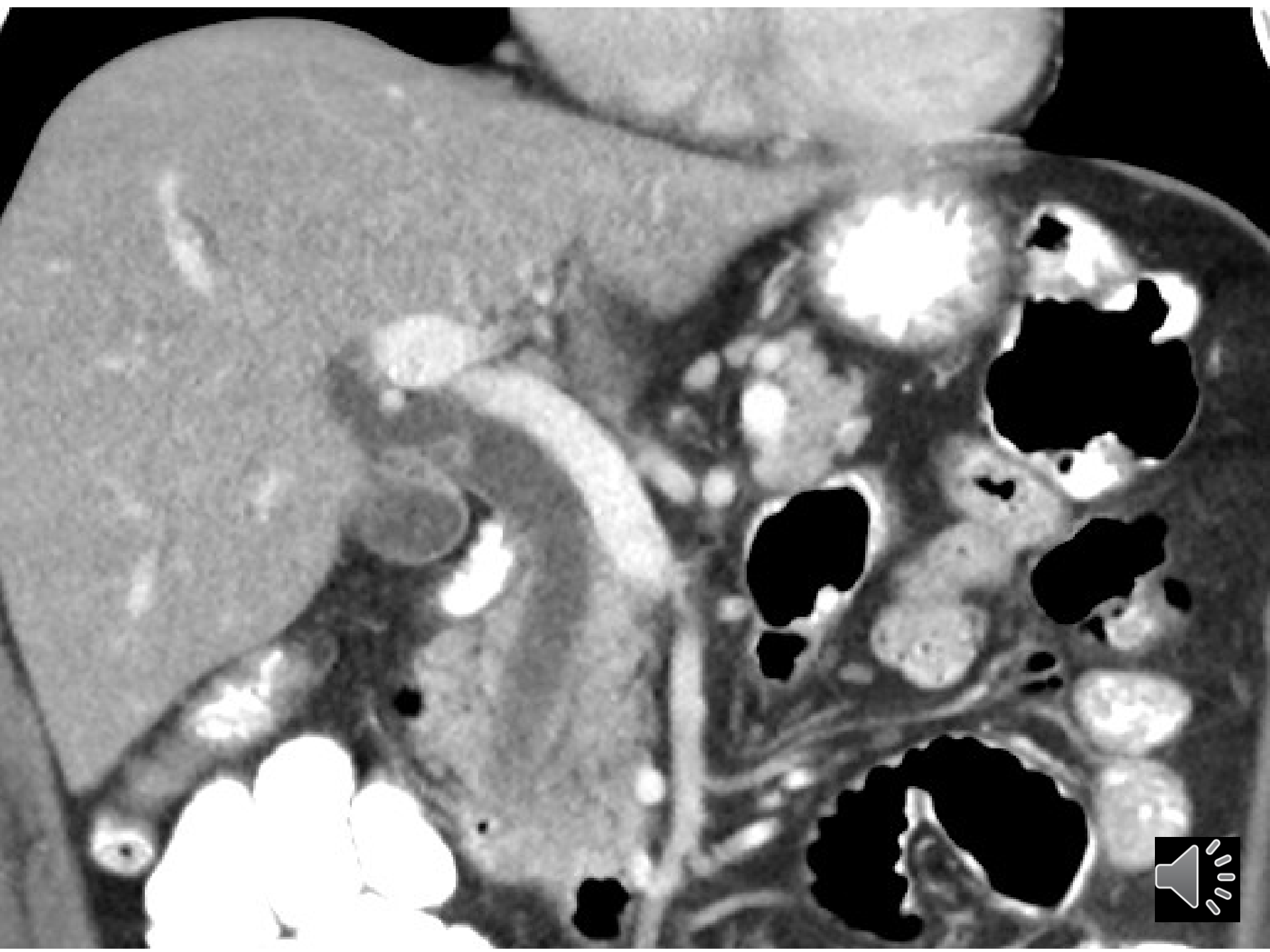
ENETS webcasts can be viewed from the 15th

ENETS strives to stay on top of latest findings in

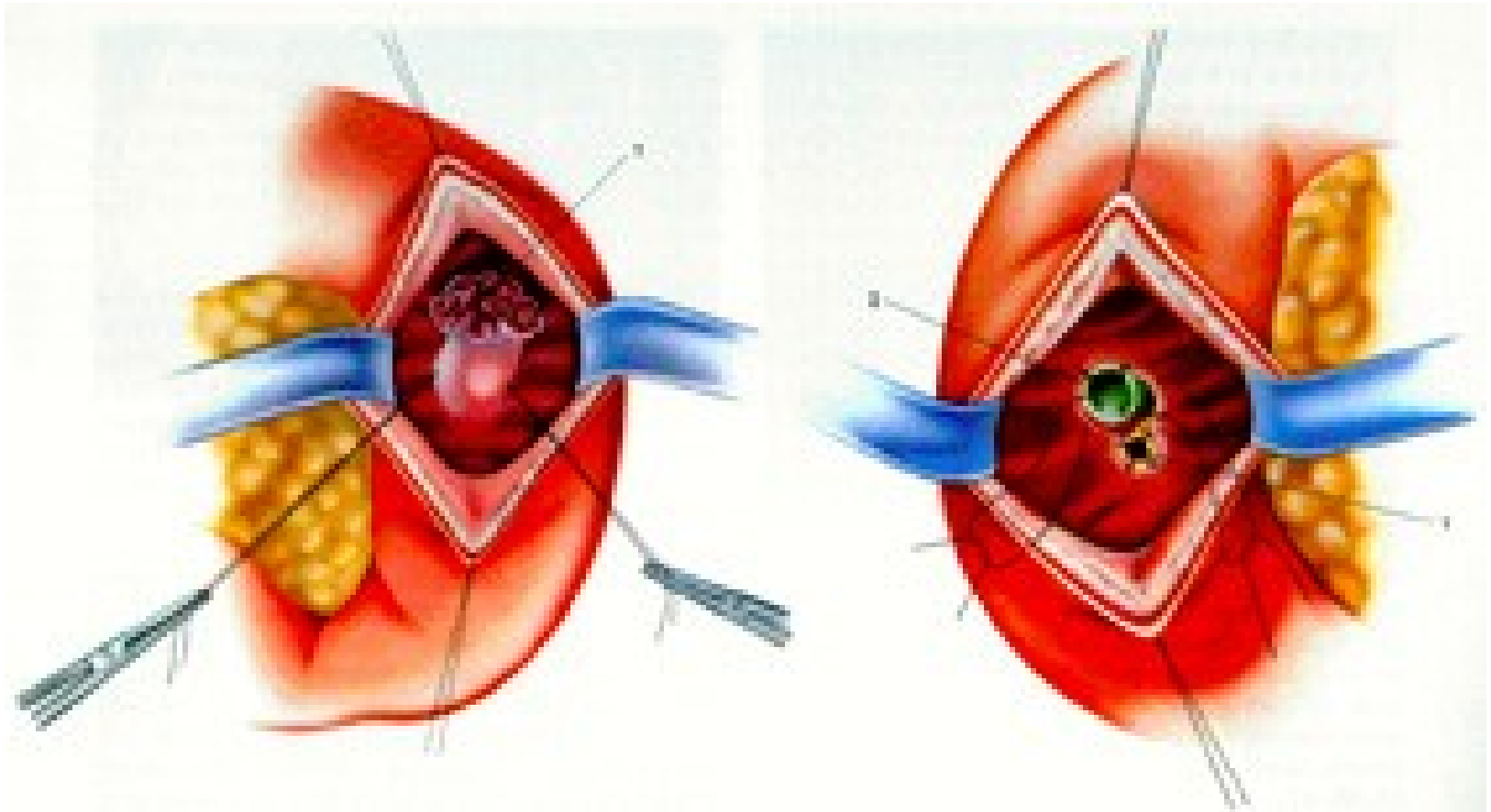
Ampulomas (Ampullary tumors)

- Endoskopische ampulektomie
- Transduodenale ampulektomie
- Pancreatoduodenektomie





Transduodenal ampulectomy



Distal common bile duct tumors

- The problem of histologic verification (ERCP brush cytology)
- New possibility - spyglass – estimation of the tumor type according to the vessel distribution – the possibility of biopsy under direct vision of choledochoscope..
- Pankreatoduodenectomy – high resectability, higher postoperative fistula incidence.
- Common bile duct carcinoma has slightly better prognosis than pancreatic cancer.



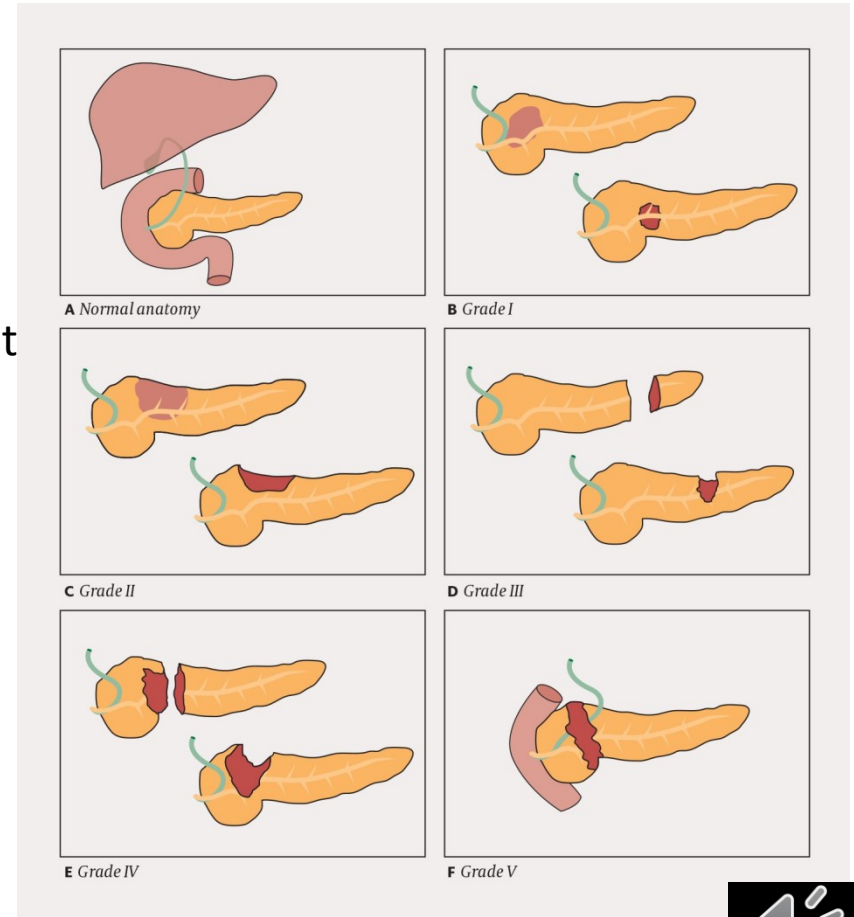
Pancreatic trauma

Less than 1% of all traumas

Therapy:

Papillosphincterotomy with Wirsung duct stent
or intraoperative drainage

Surgical resection is eminently rare



Congenital abnormalities

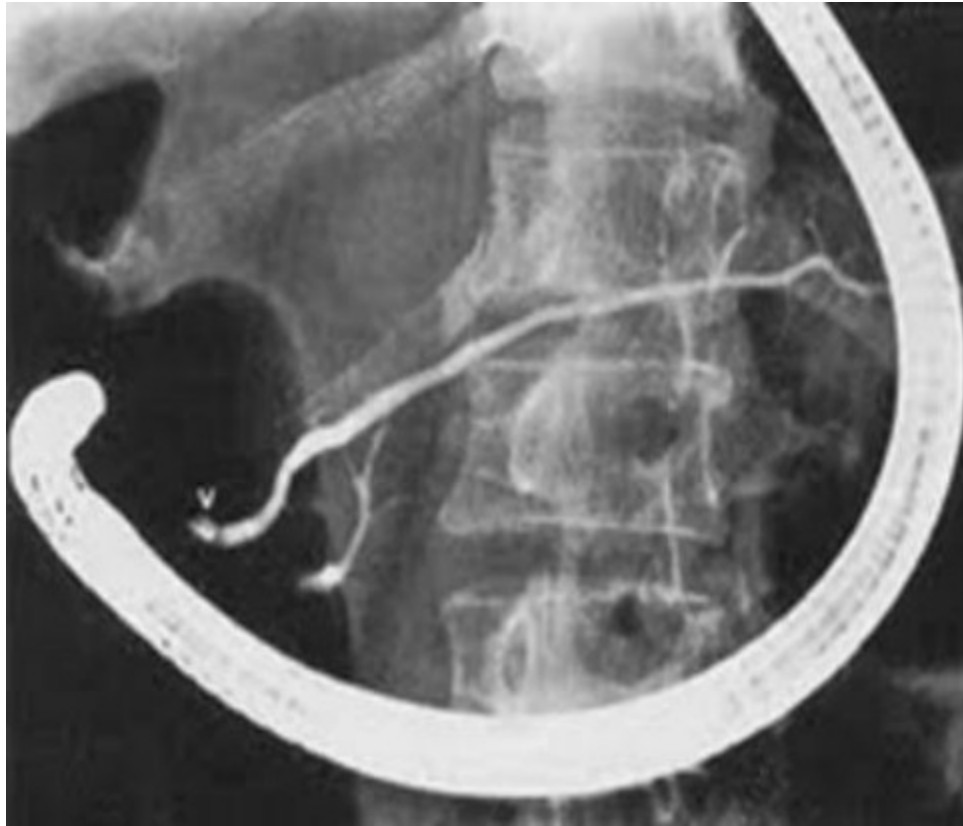
Pancreas anulare



Pancreas anulare



Pancreas divisium





Metastases of extrapancreatic tumor

Grawitz

Kolorektální karcinom



Surgery of the spleen

Splenectomy

Indication:

- **Surgical**

Trauma

As the part of oncosurgical resection for the tumor of another organ (stomach, colon, adrenal gland).

- **Hematologic**

Hemolytic anaemia

thrombocytopenia

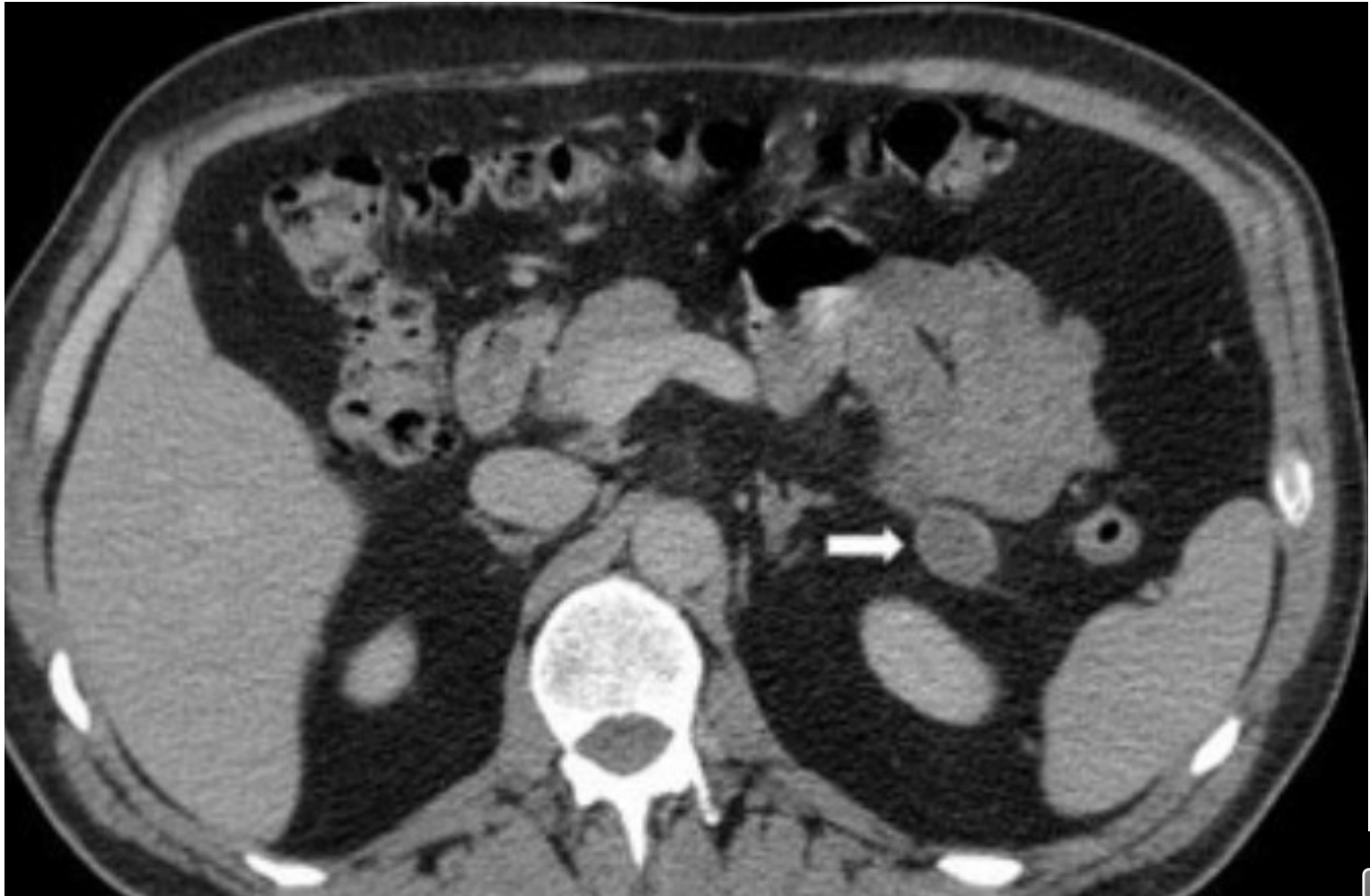
myeloproliferative syndroms

Lymphomas

- **Before splenectomy from hematologic indication CT scan for accessory spleen exclusion is needed.**



Splenunculus – accessory spleen



Surgery of the spleen

- Active immunisation for prevention of OPSI (overwhelming post-splenectomy infection).
- ATB prophylaxis



The end

