

CHRONIC PANCREATITIS AND PANCREONECRO SIS

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ETIOLOGY

Primary pancreatitis :

- Misuse of alcohol (70-80% of all diagnostic cases)
- the systematic eating of fatty foods
- influence of drugs (azathioprine , isoniazide , tetracycline , sulfonamides)
- protein deficiency
- Hereditary
- Ischemic (in lesions of vascular , which supplies blood pancreas)
- Idiopathic

Secondary pancreatitis :

- **diseases of the biliary tract (in 30-40%)**
- disease of duodenum
- a primary (tumors,papillitis) and a secondary (dyskinesia of biliary tract)
- liver disease
- bowel disease
- viral infections (parotitis)
- allergic conditions
- hyperlipidemia
- hyperparathyroidism
- injury of the pancreas

THE PATHOGENESIS OF CHRONIC PANCREATITIS

- The main pathogenetic mechanism of the development of chronic pancreatitis is acinuses destructive damage acinuses , caused intracellular activation of enzymes pancreas .
- Has significance violation of the outflow of pancreatic juice
- The progressive fibrosis caused the violation physiological function of the gland.

DURATION OF CHRONIC PANCREATITIS IS DIVIDED INTO 3 PHASES:-

- initial stage(1-5 years) – the most frequent manifestation is the pain
- expanded clinical picture (5-10 years) – main manifestation is the pain, the signs of exocrine insufficiency, the elements of incretory insufficiency (hyperglycemia, hypoglycemia)
- Remission of active pathological process or development of complications.

ULTRASOUND INVESTIGATION. CHRONIC PANCREATITIS

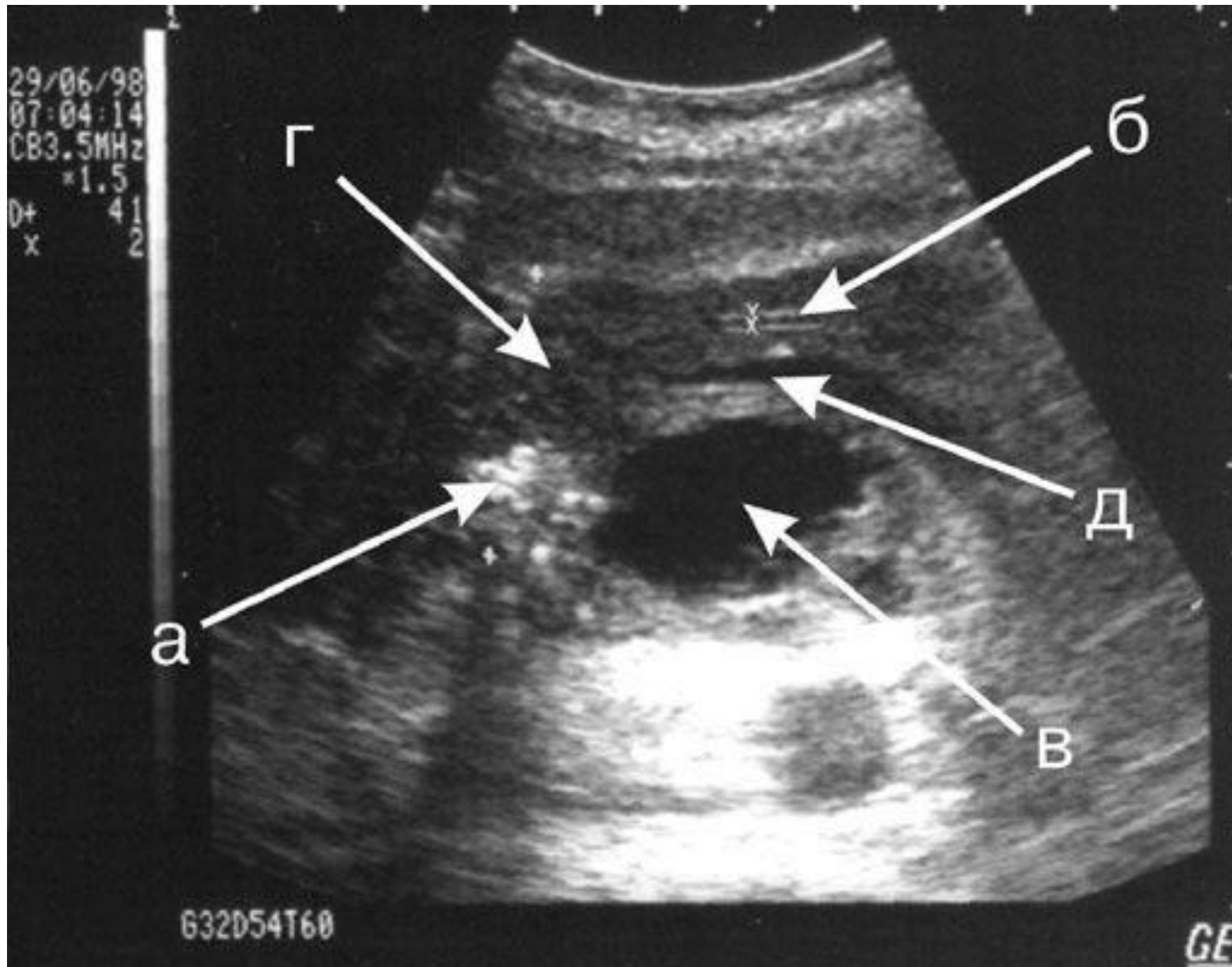
The pancreas might appear atrophic, calcified or fibrotic (advanced stages). Findings that may be present on ultrasound include:

- hyperechogenicity (often diffuse) often indicates fibrotic changes
- pseudocysts
- pseudoaneurysms
- presence of ascites

Ultrasound may also assist to differentiate between the autoimmune type vs. acquired:

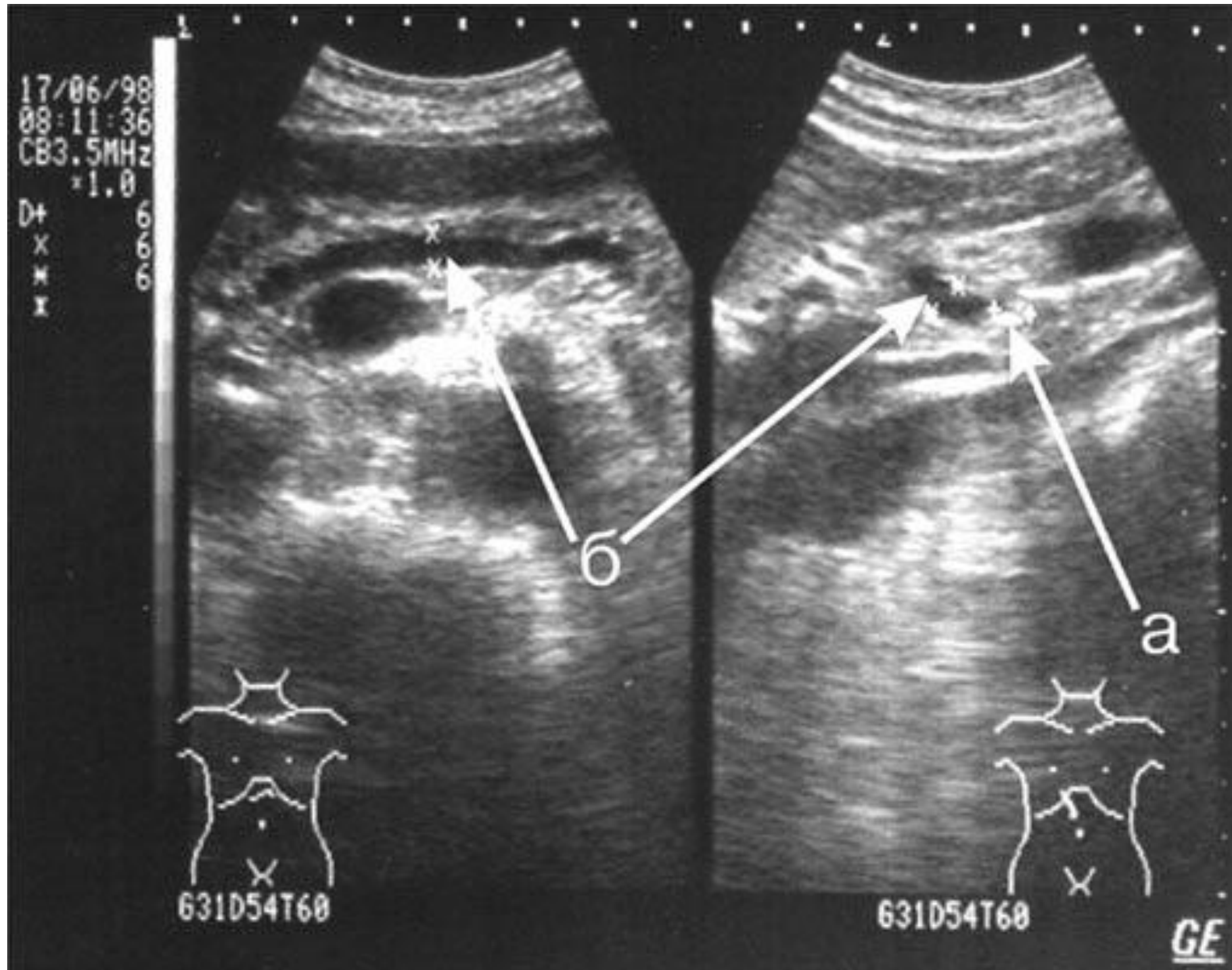
- the pancreas is enlarged (either focally or diffusely) in the autoimmune type
- calcifications are visible in acquired types

ULTRASOUND INVESTIGATION. CHRONIC PANCREATITIS



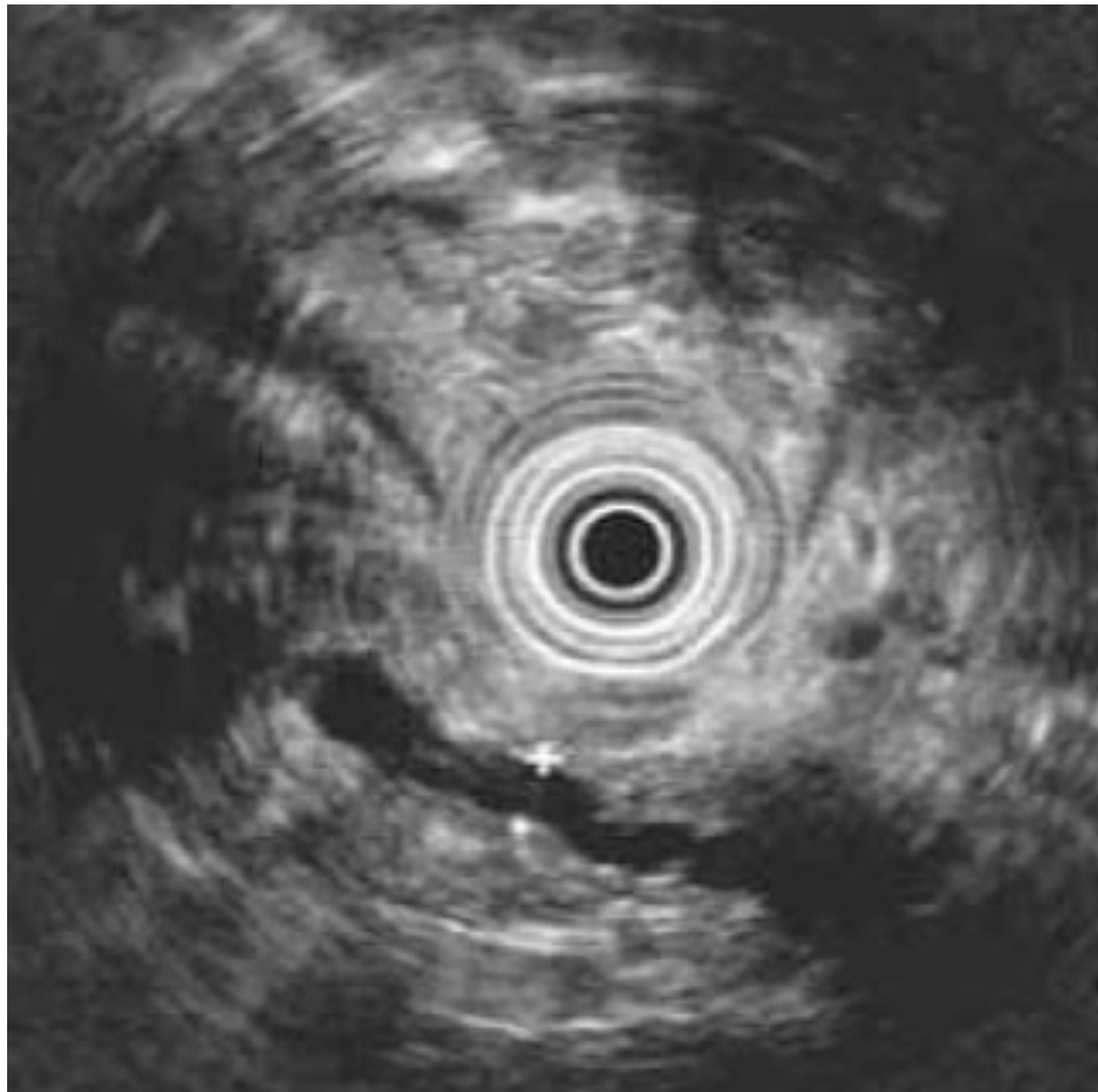
- а) calcificates in the head of pancreas;
- б) Virsungov's duct;
- в) pseudocyst of pancreas;
- г) increase of the head of pancreas;
- д) spleen vein

ULTRASOUND INVESTIGATION. CHRONIC CALCIFIED PANCREATITIS A) VIRSUNGOLITHIASIS B) DILATED VIRSUNGOV'S DUCT. · · · · ·



ENDOSCOPIC ULTRASOUND

- *has a vital diagnostic role because it is extremely sensitive in detecting the early pathological changes of chronic pancreatitis. Endoscopic ultrasound is the investigation of choice if chronic pancreatitis is suspected but not proven. Endoscopic ultrasound guided fine needle aspiration cytology is useful for the diagnosis of chronic pancreatitis and also for helping to exclude pancreatic cancer, although it may be difficult to obtain a good sample from an indurated gland.*



AN ENDOSCOPIC
ULTRASOUND IMAGE
DEMONSTRATING A DILATED
PANCREATIC DUCT (MARKERS)
IN A PATIENT WITH ADVANCED
CHRONIC PANCREATITIS

- *An endoscopic ultrasound, which allows a highly detailed examination of the pancreatic parenchyma and pancreatic duct, routinely detects abnormalities in patients with chronic pancreatitis (high sensitivity), but the specificity and reproducibility of the test requires further study*

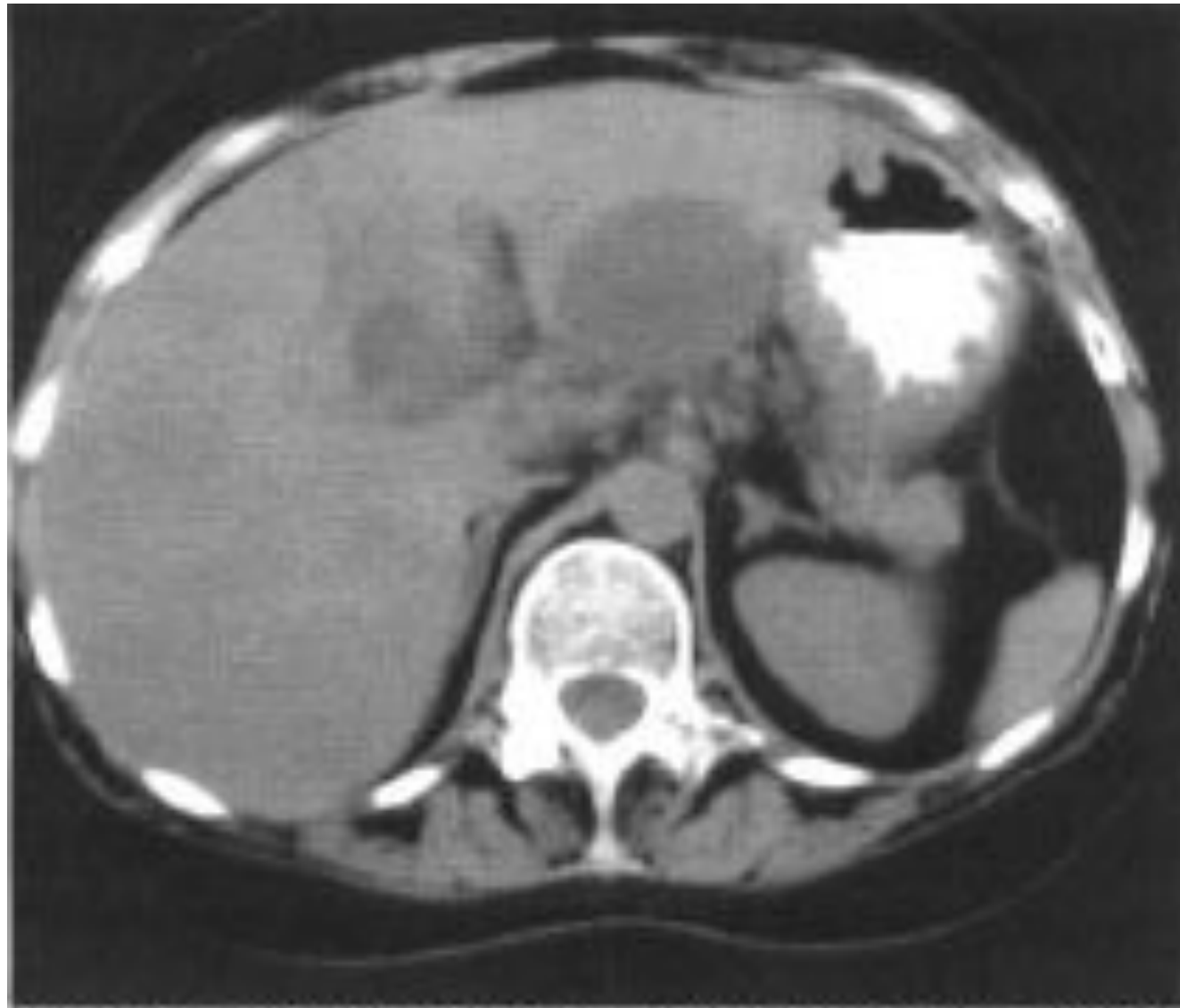
COMPUTER TOMOGRAPHY

The diagnostic information similar to ultrasound, is indicated for suspected tumors and cysts of the pancreas;

CT features of chronic pancreatitis include:

- dilatation of the main pancreatic duct
- pancreatic calcification
- changes in pancreatic size (i.e. atrophy), shape, and contour
- pancreatic pseudocysts

CT SCAN WITH CENTRAL PSEUDOCYST



Endoscopic ultrasound overcomes some of the visualisation problems and is probably more sensitive and specific.

CT has a sensitivity of up to 90% and specificity of the same order.

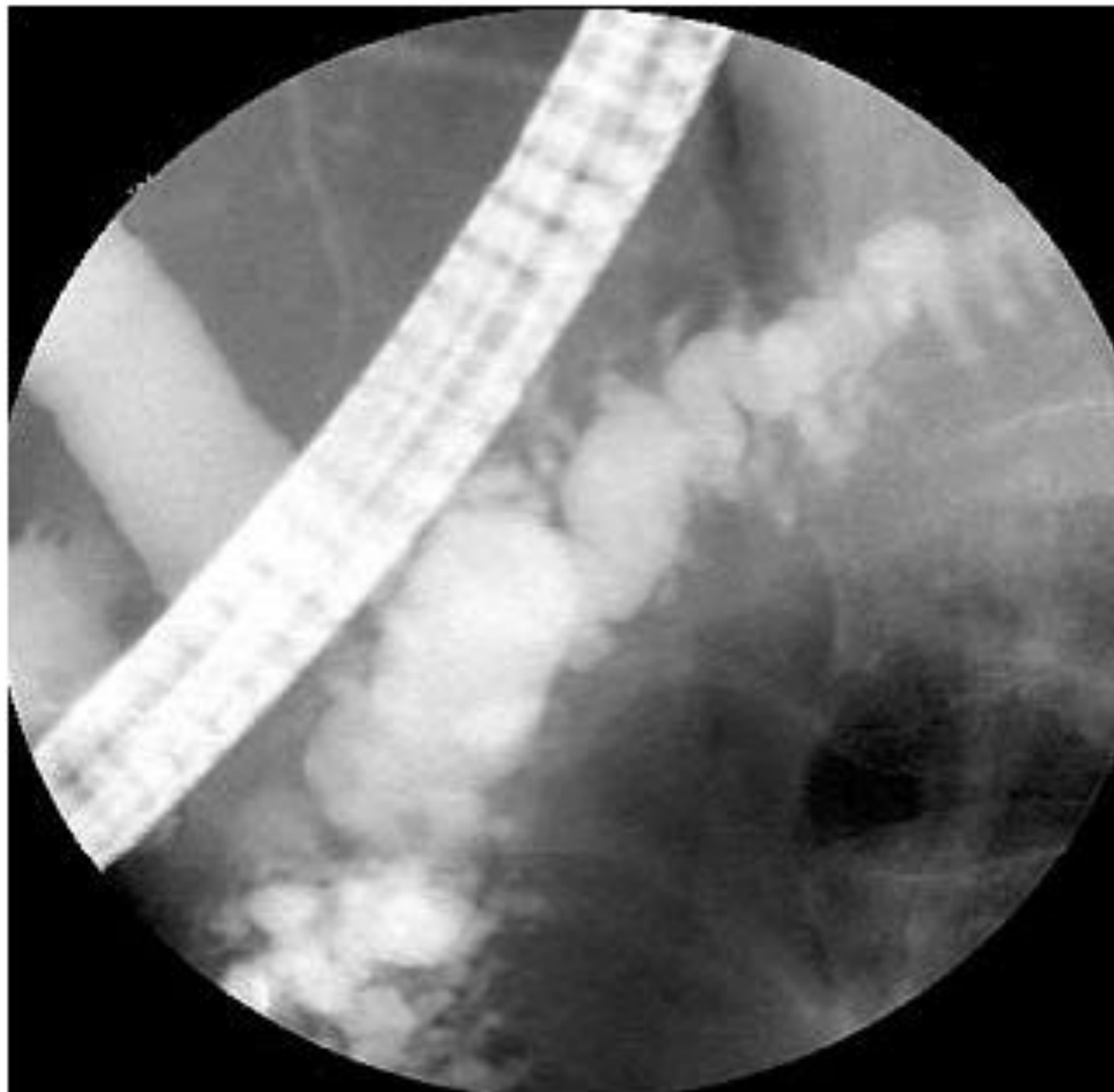
It will detect variation in ductal diameter, and ectatic side branches, changes in the parenchyma, calcification and complications of chronic pancreatitis such as pseudocyst formation

ENDOSCOPIC RETROGRADE

- *reveals impaired patency of the main and secondary ducts. "Chain of lakes" is a classic symptom of chronic pancreatitis (areas of constriction and expansion of virsunhov ducts).*
- *It is also possible the segmental or total obstruction of a ductal system of pancreas.*



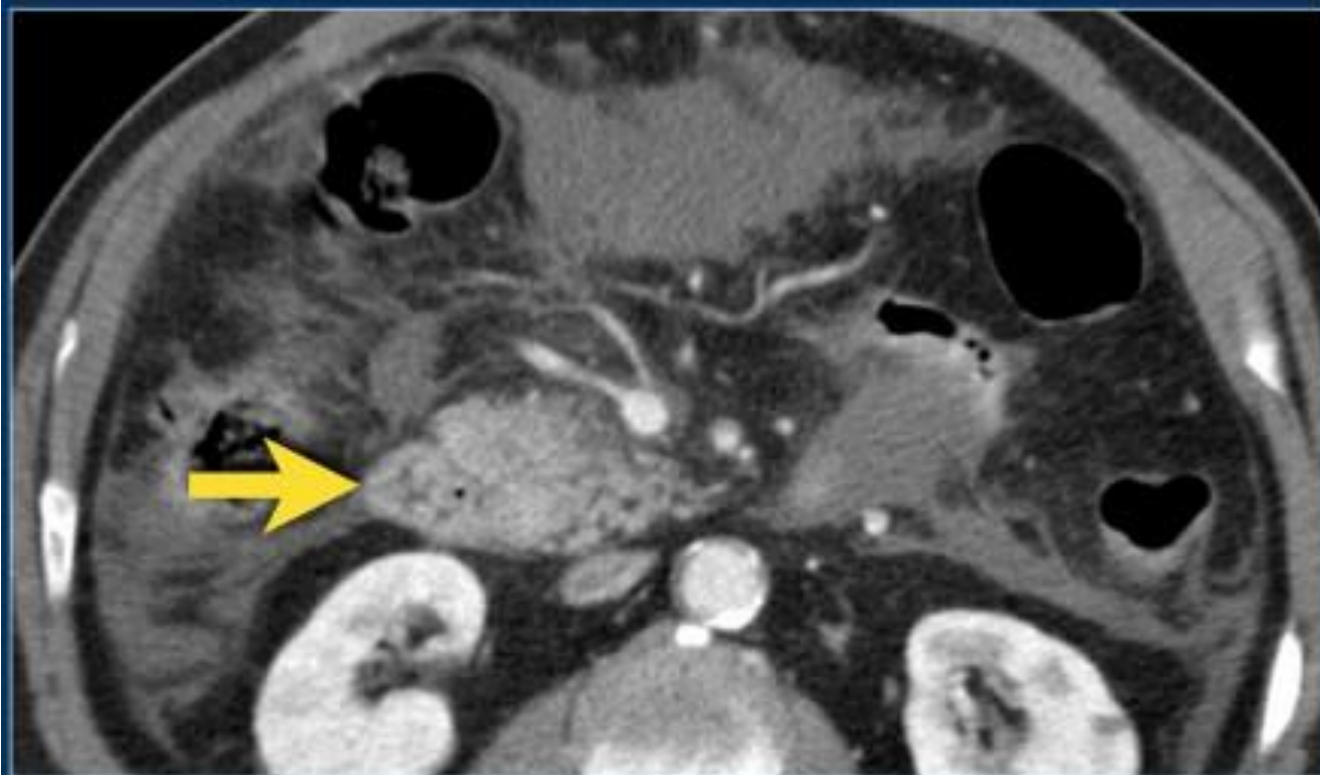
An endoscopic retrograde cholangiopancreatography image demonstrating minimal pancreatic duct abnormalities in a patient with painful small-duct chronic pancreatitis.



An endoscopic retrograde cholangiopancreatography image demonstrating massive pancreatic duct dilatation in a patient with bigduct chronic pancreatitis.

PANCREONECROSIS

- *Necrotizing Pancreatitis*
- *Necrosis of pancreatic parenchyma or peripancreatic tissues occurs in 10-15 % of patients.*
- *It is characterized by a protracted clinical course, a high incidence of local complications, and a high mortality rate.*
- *There are 3 subtypes of necrotizing pancreatitis:*
- *1 Necrosis of both pancreatic parenchyma and peripancreatic tissues (most common).*
- *2 Necrosis of only extrapancreatic tissue without necrosis of pancreatic parenchyma (less common).*
- *3 Necrosis of pancreatic parenchyma without surrounding necrosis of peripancreatic tissue (very rare).*

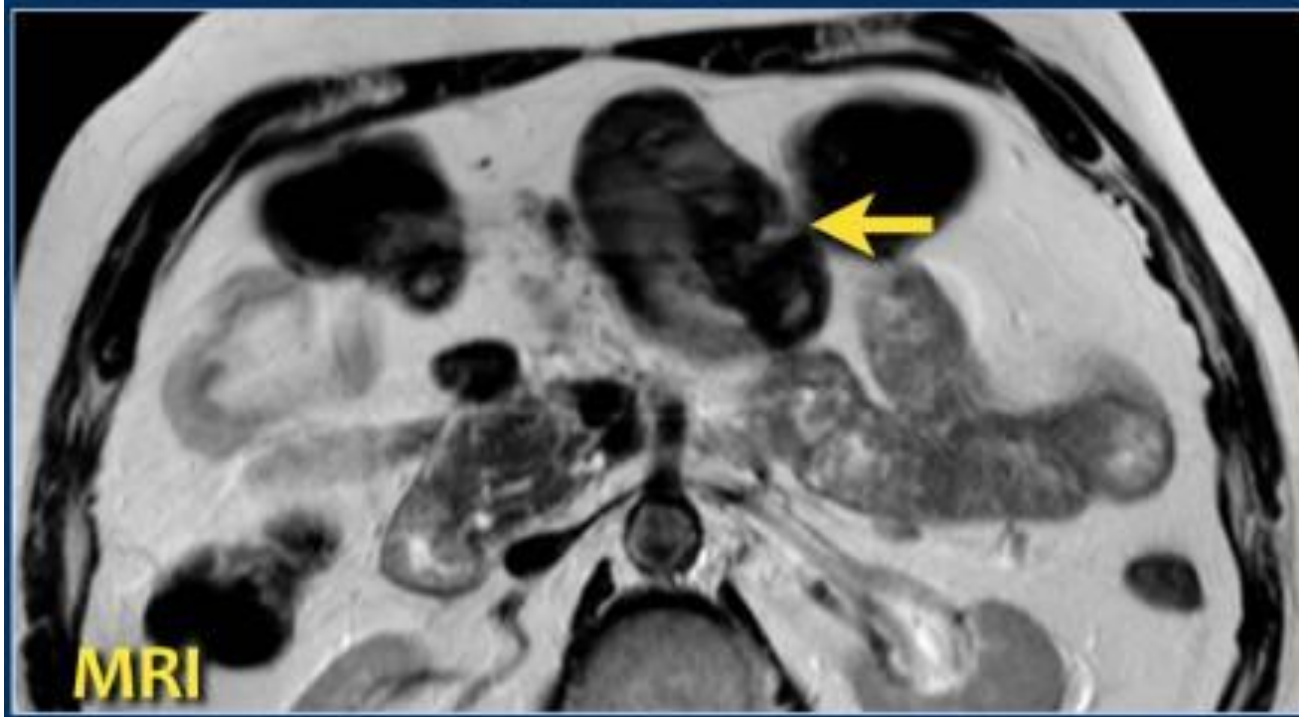
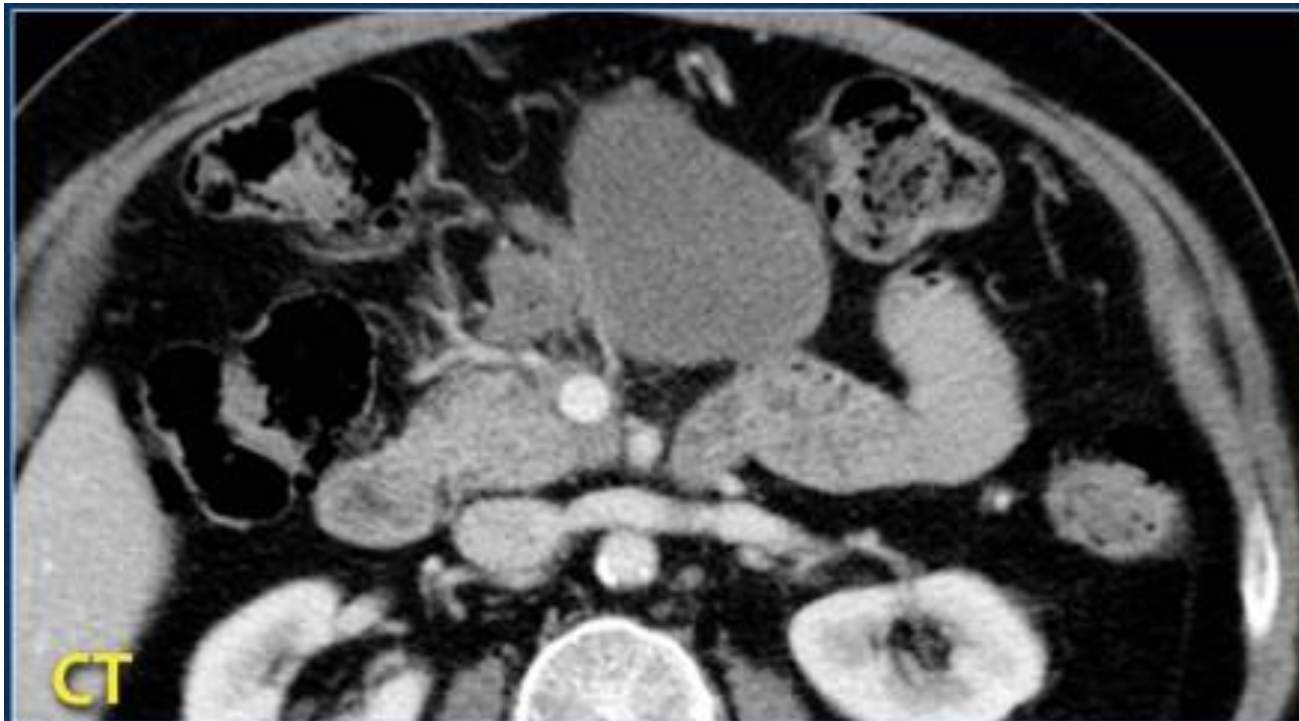


- *Necrosis of the pancreatic parenchyma can be diagnosed on a contrast-enhanced CT \geq 72 hours.*
- *Necrosis of peripancreatic tissue can be vary difficult to diagnose, but is suspected when the collection is inhomogeneous, i.e. various densities on CT..*
- *The CT shows an acute necrotizing pancreatitis.*
- *The body and tail of the pancreas do not enhance.*
- *There is normal enhancement of the pancreatic head (arrow).*
- *More than 50% of the pancreas is necrotic and there are at least two collections.*
- *CTSI: 4 + 6 = 10 points.*

MRI



- *MRI is superior to CT in differentiating between fluid and solid necrotic debris.*
- *Here a patient with several homogeneous peripancreatic collections on CT.*
- *These collections also show homogeneous high signal intensity on a fat-suppressed T2-weighted MRI image, are fully encapsulated and contain clear fluid (i.e. pseudocysts).*

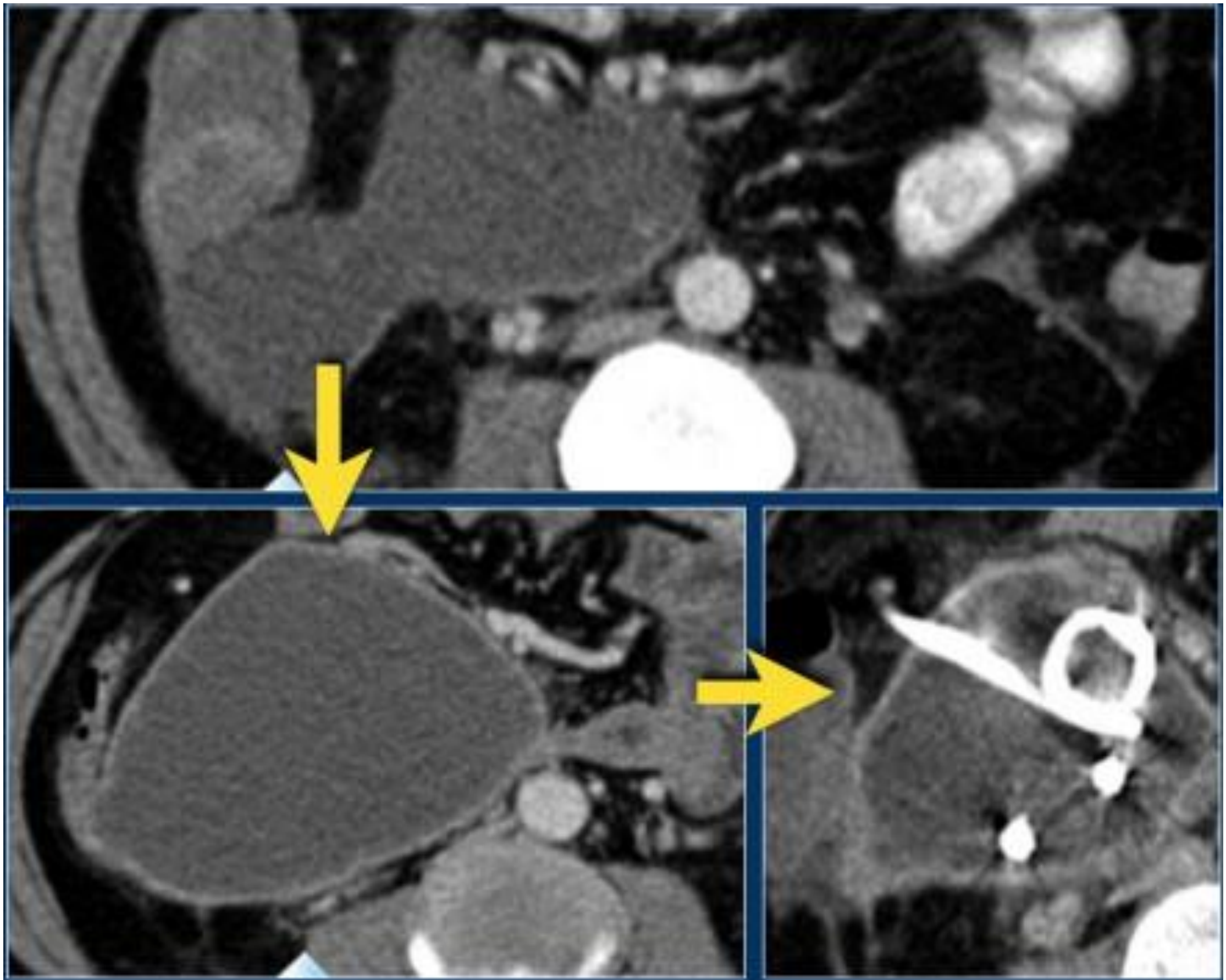


- *This patient had an acute necrotizing pancreatitis with onset 2 months earlier.*
- *The CT-image shows a homogeneous peripancreatic collection in the transverse mesocolon (arrow).*
- *A T2-weighted MRI sequence shows that the collection has a low signal intensity (arrow).*
- *Most likely this is necrotic fat tissue (i.e. sterile necrosis or walled-off necrosis).*
- *This patient had no fever or signs of sepsis.*
- *Endoscopic or percutaneous drainage would have little or no effect on its size, but increases the risk of infection.*

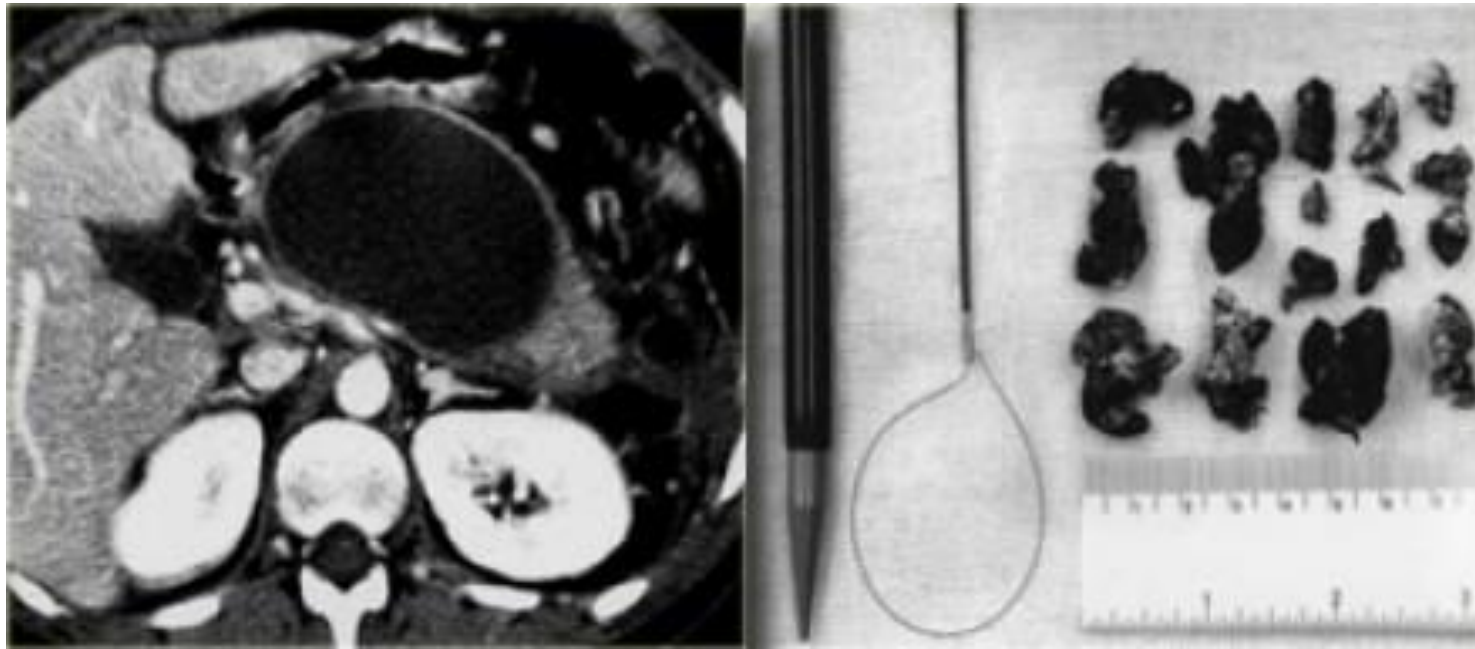
WALLED-OFF NECROSIS - WON

- On a follow-up scan the collection in the right anterior pararenal space increased in size.
- It has fluid density and a thin enhancing wall.
- This can be a pseudocyst or walled-off-necrosis and it may or may not be infected.
- The patient became septic and a percutaneous drainage was performed.
- After drainage the collection barely diminished in size.
- The patient underwent surgery and the collection was found to consist of necrotic debris, which was not appreciated on CT, hence this was a walled-off-necrosis and not a pseudocyst.
- The necrotic debris was too viscous for successful percutaneous drainage

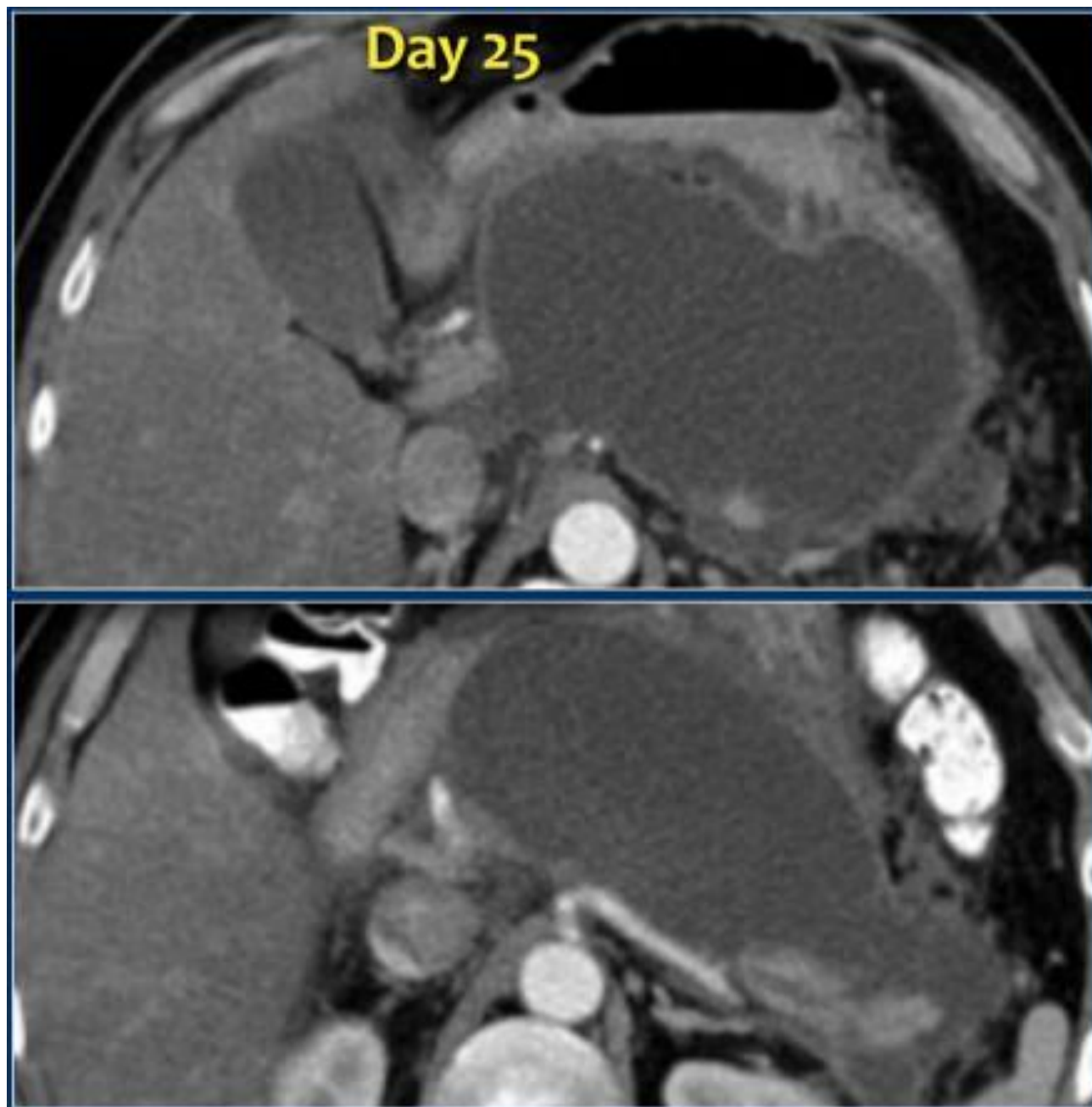
- Based on CT alone it is sometimes impossible to determine whether a collection contains fluid only or a mixture of fluid and necrotic tissue.
- Consequently it is sometimes better to describe these as 'indeterminate peripancreatic collections'.
- The images are of a patient with acute pancreatitis.
- On the upper image is a collection in the area of the pancreatic head in the right anterior pararenal space.
- At this stage, it is not possible to distinguish between an acute peripancreatic fluid collection and acute necrotic collection.



WALLED-OFF-NECROSIS



- *These CT-images are of a patient on day 40.*
- *This patient had central gland necrosis and now developed fever.*
- *The CT shows a similar collection of fluid density to that of the patient with the pseudocyst, except for its pancreatic location.*
- *The collection is homogeneous and well-demarcated with a thin wall abutting the stomach.*
- *During endoscopic debridement this collection contained fluid and necrotic tissue, which was removed from the area of the pancreas.*
- *Although the imaging characteristics in this case are similar to the patient with the pseudocyst, this proved to be infected walled-off-necrosis.*

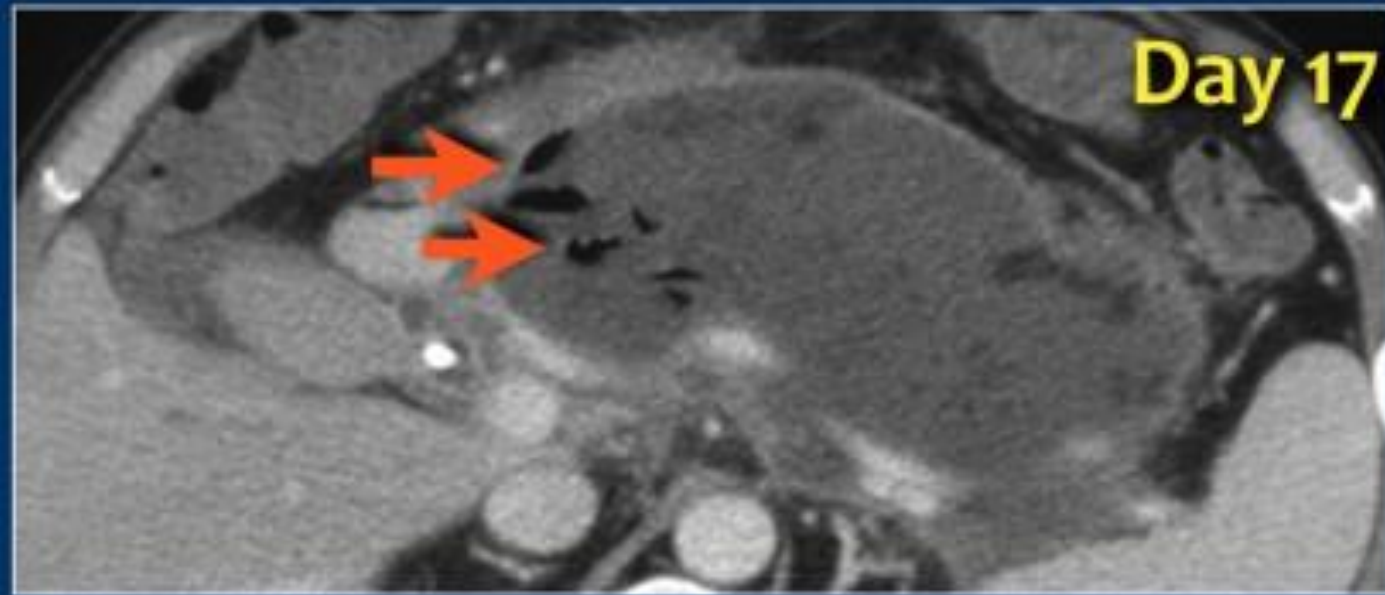
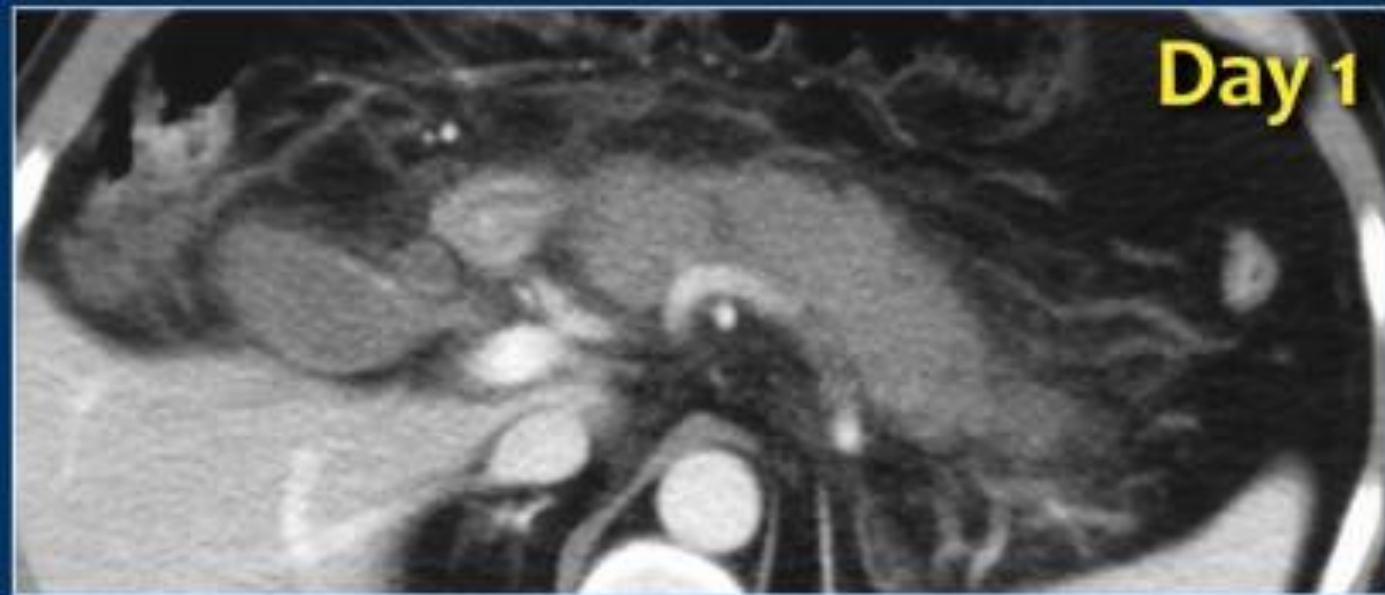


WALLED-OFF-NECRO-

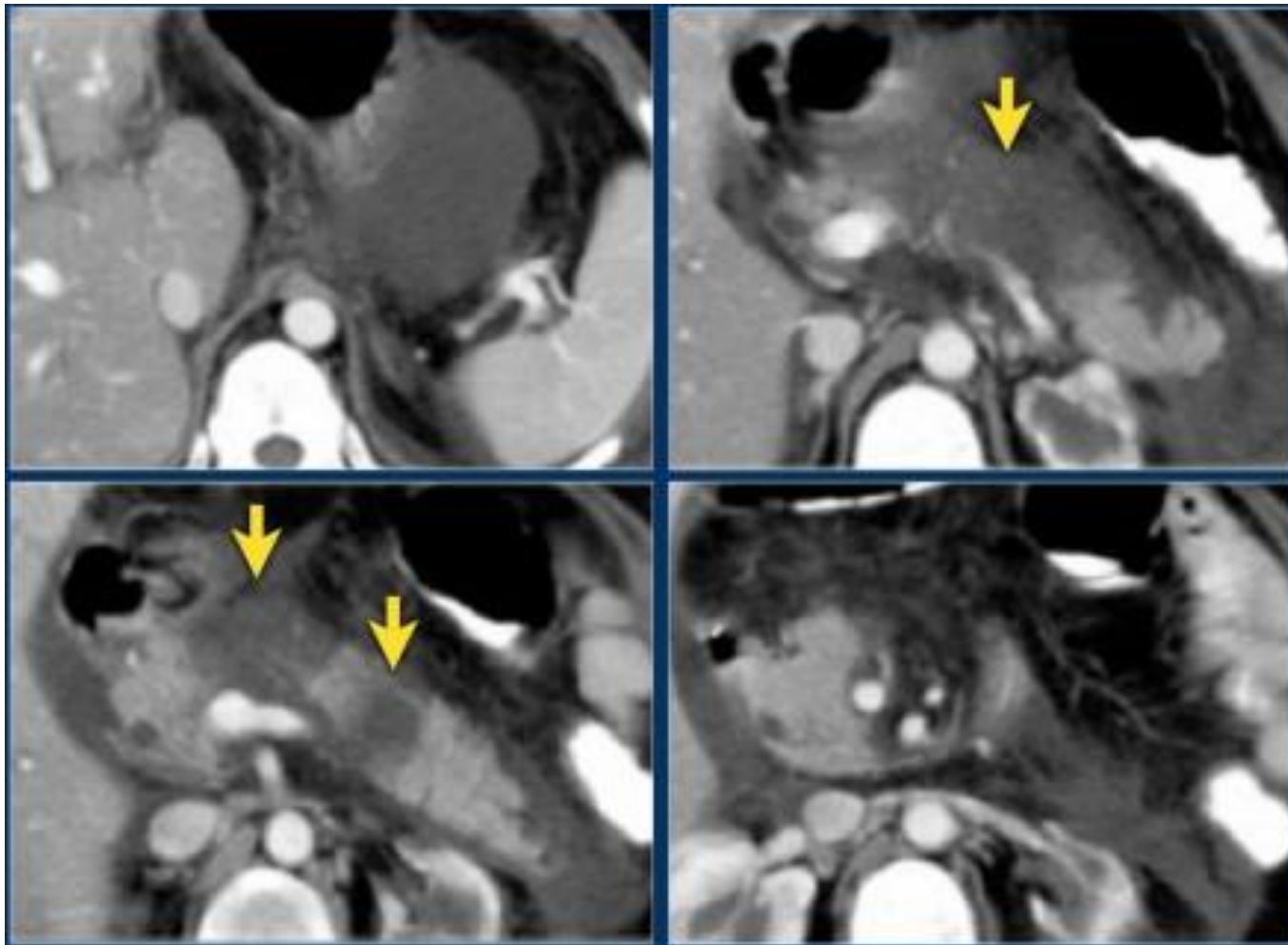
- *Here we see a homogeneous pancreatic and peripancreatic collection, well demarcated with an enhancing wall, on day 25 of an episode of acute necrotizing pancreatitis.*
- *This patient had fever and multiple organ failure.*
- *Therefore, this collection was suspected to be infected WON and not a pseudocyst.*
- *At surgery, the collection contained much necrotic debris, which was not depicted on CT.*
- *These cases illustrate that at times CT cannot reliably differentiate between collections that consist of fluid only and those that contain fluid and solid necrotic debris with or without*

INFECTED NECROSIS

- *Infected necrosis is:*
 - *Infection of necrotic pancreatic parenchyma or extrapancreatic fatty tissue - i.e. infected ANC or infected WON, depending on degree of encapsulation.*
 - *Usually occurs in the 2nd-4th week and rarely in the first week.*
 - *Most severe local complication of acute necrotizing pancreatitis.*
 - *Most common cause of death in patients with acute pancreatitis.*
 - *Diagnose infected necrosis when there are gas bubbles on CT (seen in 40%) or when FNA is positive for bacteria.*
- *This case is a typical example of infected pancreatic necrosis.*
 - *On day 1 there is enhancement of the pancreas and it just looks like a mild interstitial pancreatitis.*
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- *On day 3 there is no enhancement of the pancreas, consistent with necrosis.*
 - *The necrosis also involves the peripancreatic tissue.*
 - *So this is an ANC - acute necrotic collection.*
 - *On day 17 there are gas bubbles in the necrotic collection consistent with infected pancreatic and peripancreatic necrosis.*
- *A wall surrounds the collection.*
- *The term pancreatic abscess is no longer used, since a collection of pus without necrotic tissue is extremely uncommon in acute pancreatitis.*



CENTRAL GLAND NECROSIS



- *Central gland necrosis is a specific form of necrotizing pancreatitis, representing full thickness necrosis between the pancreatic head and tail and is nearly always associated with disruption of the pancreatic duct.*
- *This leads to persistent collections as the viable pancreatic tail continues to secrete pancreatic juices.*
- *These collections may react poorly to endoscopic or percutaneous drainage.*
- *Definitive treatment may require distal pancreatectomy or long-term endoscopic drainage.*