Scandinavian Baltic Pancreas Club
Multicenter Database

User Manual
Imaging Module
SBPC database

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A practical guide to how imaging data is to be registered

Prerequisites:

- Based on review of relevant pancreatic imaging examinations within 3 years before core module registration or during period between follow-up visits.
- Imaging findings are **not solely based on information in the imaging report**.
- The imaging review is **performed by a physician with adequate training**.

General comments:

- Record imaging features based on results from what you regard as the **most accurate imaging modality first** (Next slide).
- If more than one imaging modality has been employed, **results from additional imaging modalities should be recorded as separate registrations.**
- If you find that an imaging feature is not assessable; record as **"not evaluated".**
- For features that are **inherently subjective**, record it based on your **best judgement**.

Modality priority

In many patients several examinations are available.

1) CT closest to baseline or follow up visit has priority.

2) MR/EUS/US can be registered as separate contacts.

In many cases the supplementary modalities are valuable for assessment of all criteria. Results from these should be registered if available.

Pancreatic duct morphology

Save & Exit Form

Save & Go To N

-- Cancel --

Pancreatic DUCTAL morphology

Scan modality	○ CT ○ MRI ◉ Transabdominal ultrasound ○ Endoscopic ultrasound reset
Scan date	Today D-M-Y
Main pancreatic duct diameter enlarged?	○ NOT evaluated ◉ No ○ Yes reset
Main pancreatic duct diameter (HEAD)	Largest diameter (mm)
Main pancreatic duct diameter (BODY)	Largest diameter (mm)
Irregular ducts	○ NOT evaluated ◉ No ○ Yes reset
Irregular ducts (largest caliber variation)	○ Moderate (< 2 mm) ○ Marked (≥2 mm) reset
Duct obstruction? (Abrupt caliber change: proximal dilatation and small caliber)	○ NOT evaluated ◉ No ○ Yes reset
Intraductal filling defects or caliculi?	○ NOT evaluated ◉ No ○ Yes reset
Dilated side ducts?	○ NOT evaluated ◉ No ○ Yes reset
No of dilated side ducts?	○ Moderate (< 3 dilated side ducts) ○ Marked (≥3 dilated side ducts) reset

Scan modality

Scan modality

- ○ CT
- ○ MRI
- ○ Transabdominal ultrasound
- ◉ Endoscopic ultrasound

reset

- REDCAP allows only one modality in each registration and findings should be based on either CT, MRI, transabdominal ultrasound or endoscopic ultrasound (ERCP is excluded from this list).

- If several imaging modalities have been employed prior to registration, results from additional imaging modalities should be recorded as separate registrations.

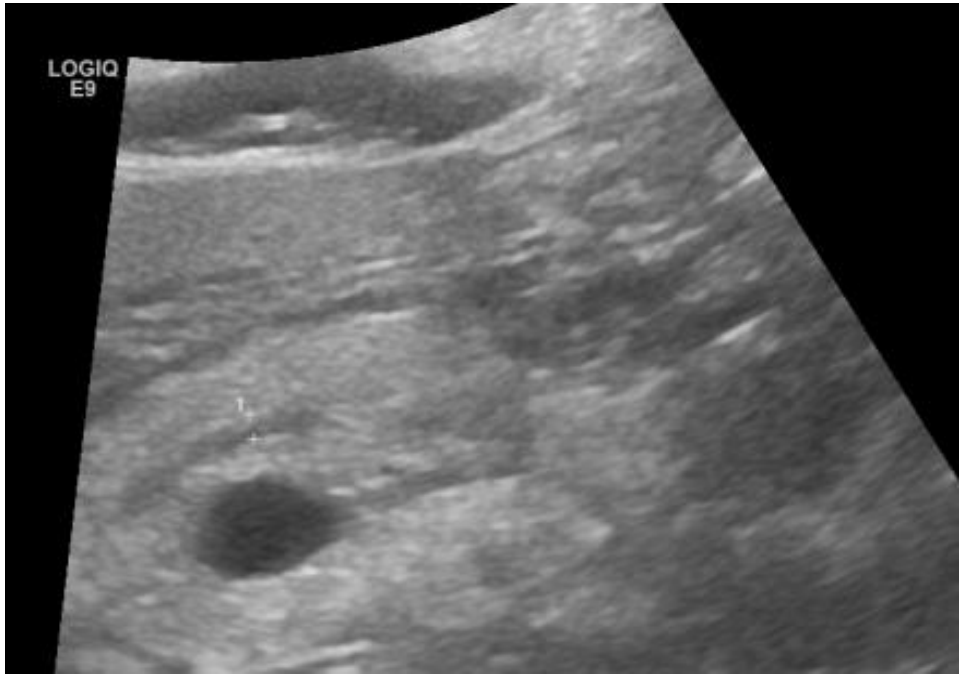
MPD caliber - definitions

- Main pancreatic duct (MPD) is considered dilated when main pancreatic duct measures: ≥4mm in the head and ≥ 3mm in the body
- Record the largest MPD diameter in the head and the body (on axial or coronal images, only transverse/perpendicular diameter)
- Measurements in millimetre (mm)

Main pancreatic duct diameter enlarged?	○ NOT evaluated ○ No ◉ Yes reset
Main pancreatic duct diameter (HEAD)	5 Largest diameter (mm)
Main pancreatic duct diameter (BODY)	3 Largest diameter (mm)

MPD diameter measurements - US

US

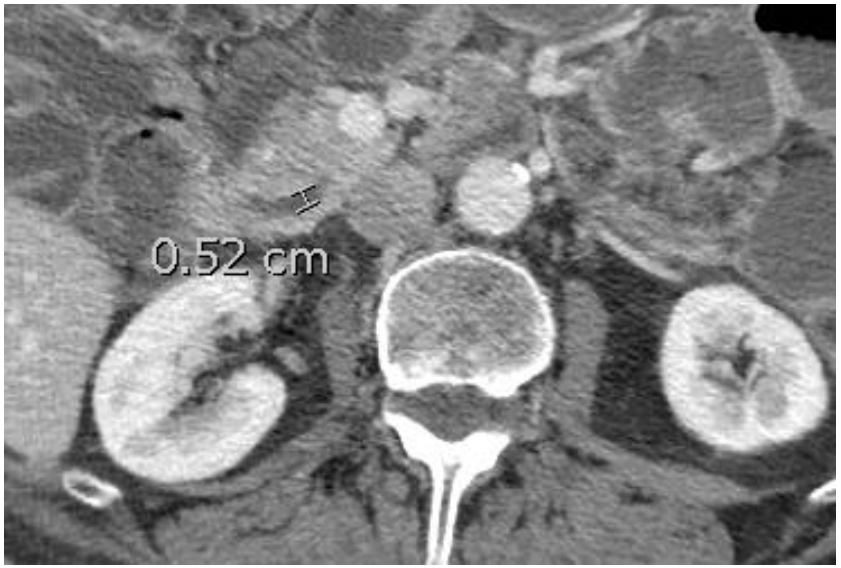


EUS

Leading edge to leading edge in sonography

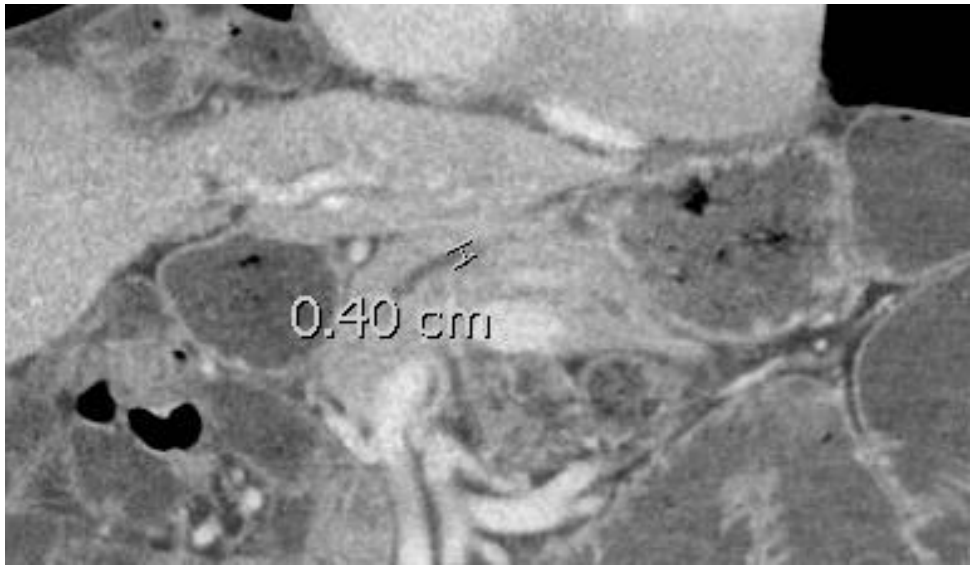
MPD measurement – CT with intravenous (i.v.) contrast (C)

Axial



MPD diameter is 5.2 mm in the pancreatic head.

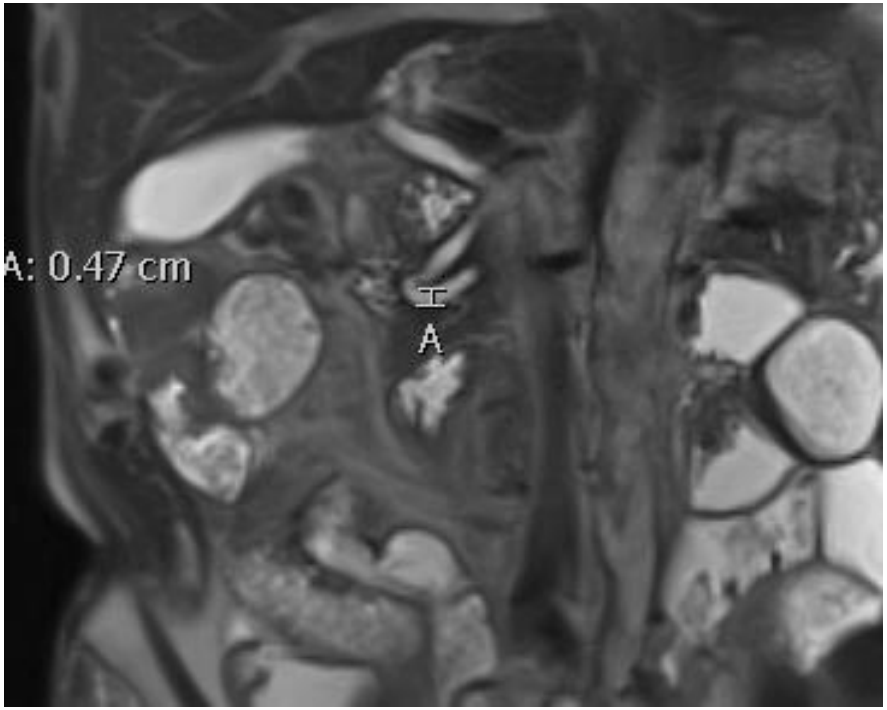
Coronal reconstruction



MPD diameter is 4.0 mm in the pancreatic body.

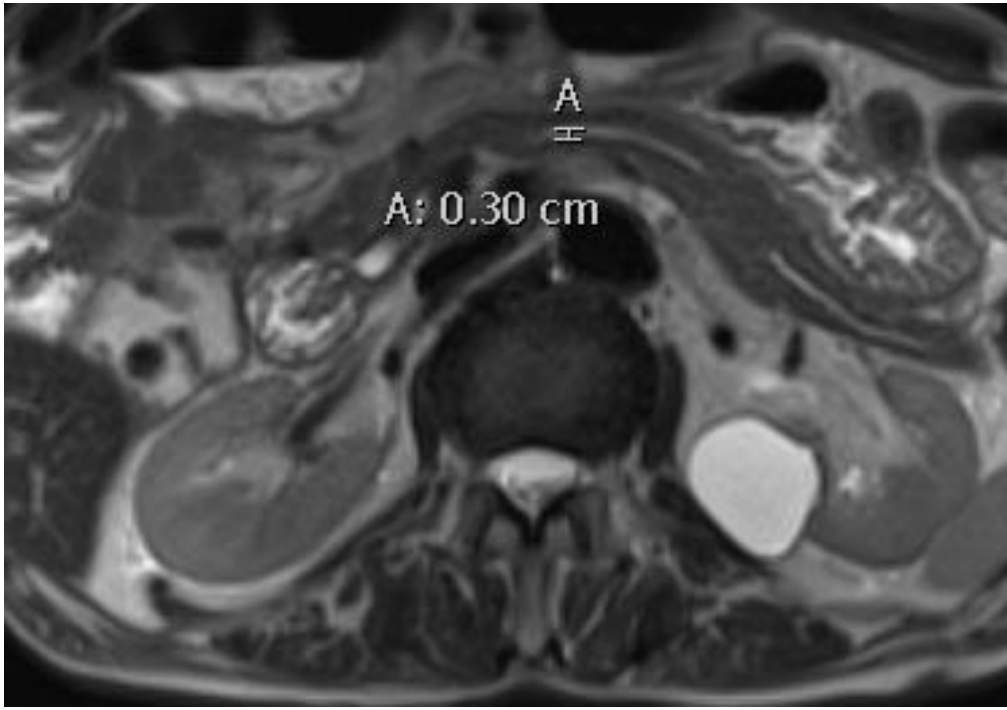
MPD diameter measurement - MRI

Coronal T2-weighted



MPD diameter is 4.7 mm in the pancreatic head.

Axial T2-weighted



MPD diameter is 3.0 mm in the pancreatic body.

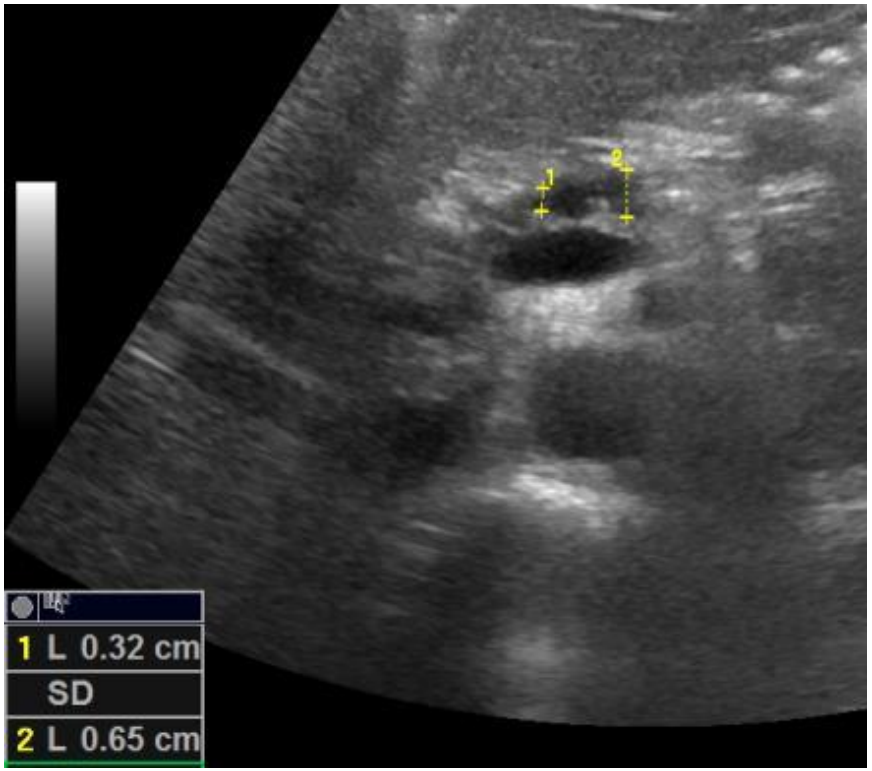
Irregular ducts

- MPD contour being irregular or partly ectatic.
- Ductal irregularity is best depicted in the pancreatic body and tail.
- Calliber variations >1mm are recorded as irregular ducts and graded as moderate (if 1-2mm variation) or marked (if ≥2mm).
- PS: SHOULD NOT BE CONFUSED WITH STENOSIS/OBSTRUCTION (see next …)

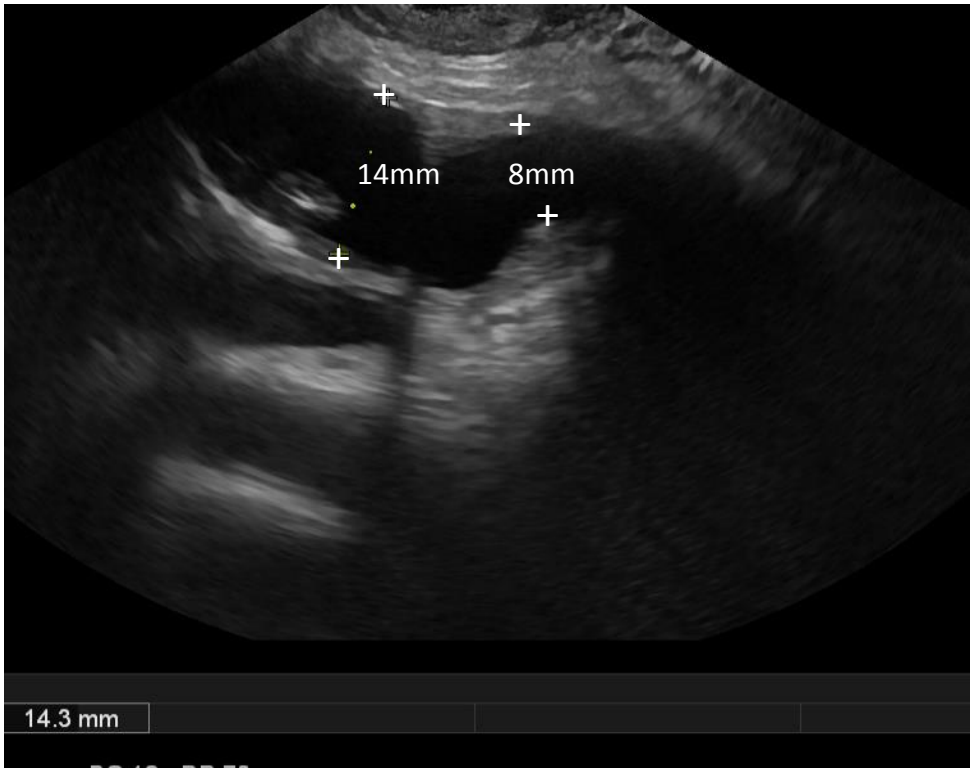
Irregular ducts	○ NOT evaluated ◉ No ○ Yes	reset
Irregular ducts (largest caliber variation)	○ Moderate (< 2 mm) ○ Marked (≥2 mm)	reset

Irregular ducts

US

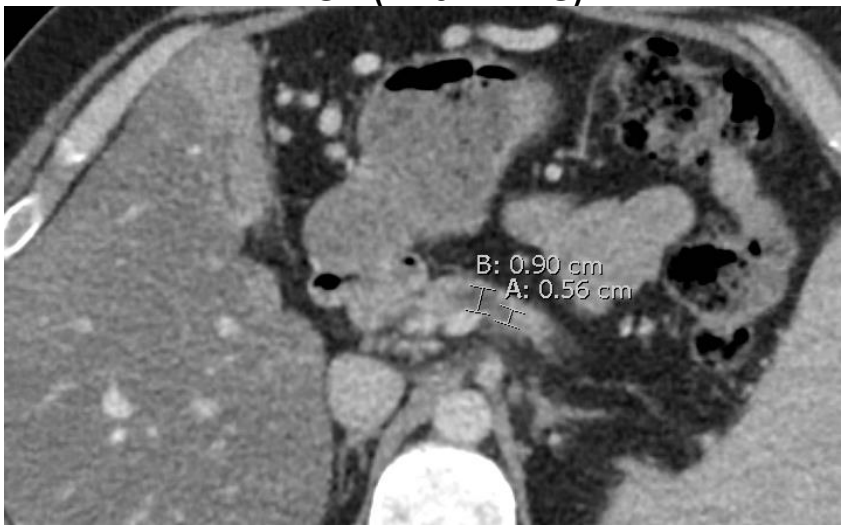


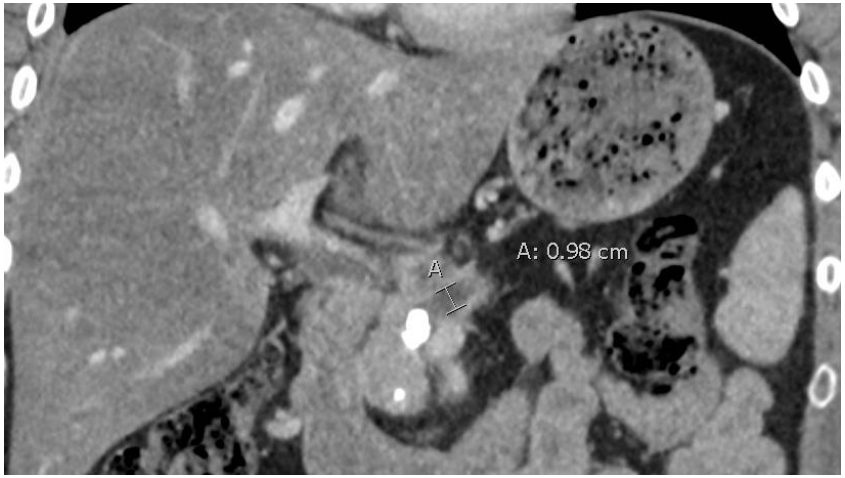
EUS



Irregular ducts

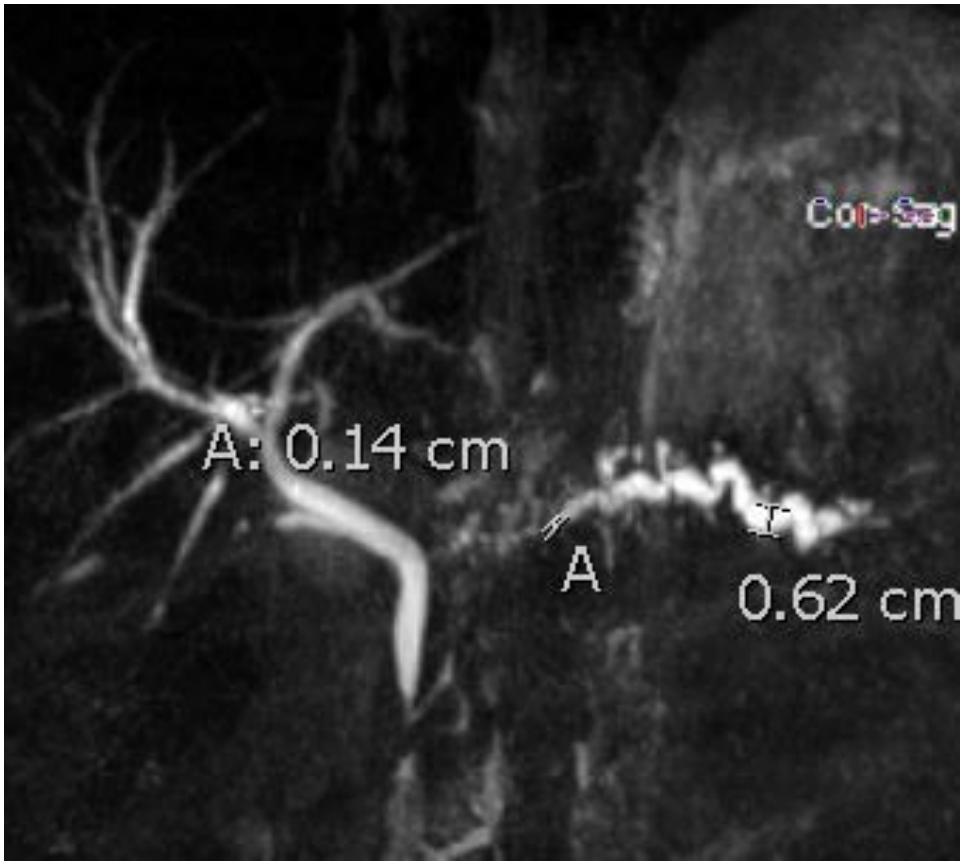
CT (with i.v. C)





Variable MPD diameter in the body proximal to ductal stone (causing obstruction)

MCRP



Variable MPD diameter in the pancreatic body and tail

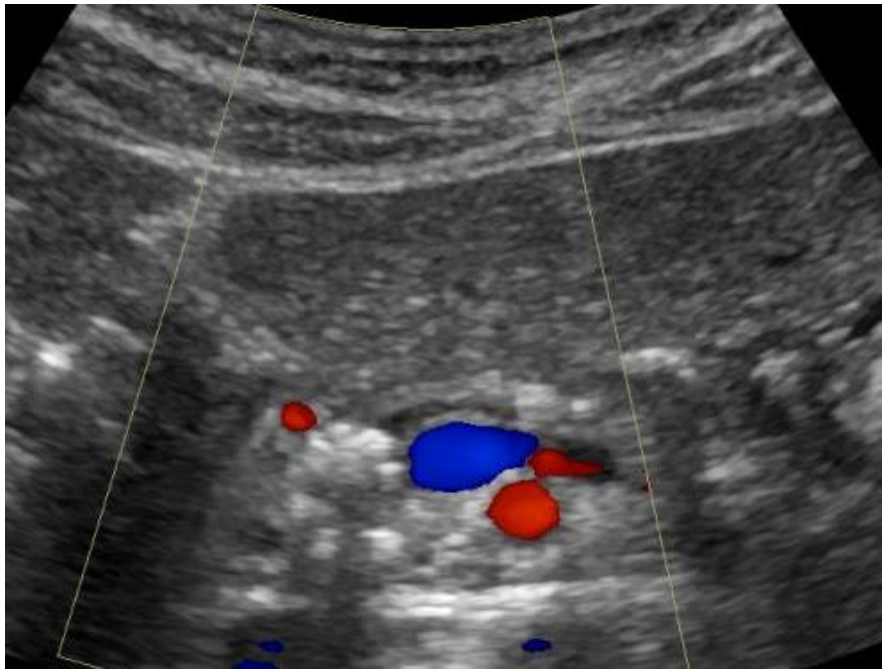
Ductal obstruction

- Definition: Focal abrupt caliber change: Upstream dilatation and small caliber downstream.

Duct obstruction?
(Abrupt caliber change: proximal dilatation and small caliber)

○ NOT evaluated ◉ No ○ Yes

US



CT + i.v. C

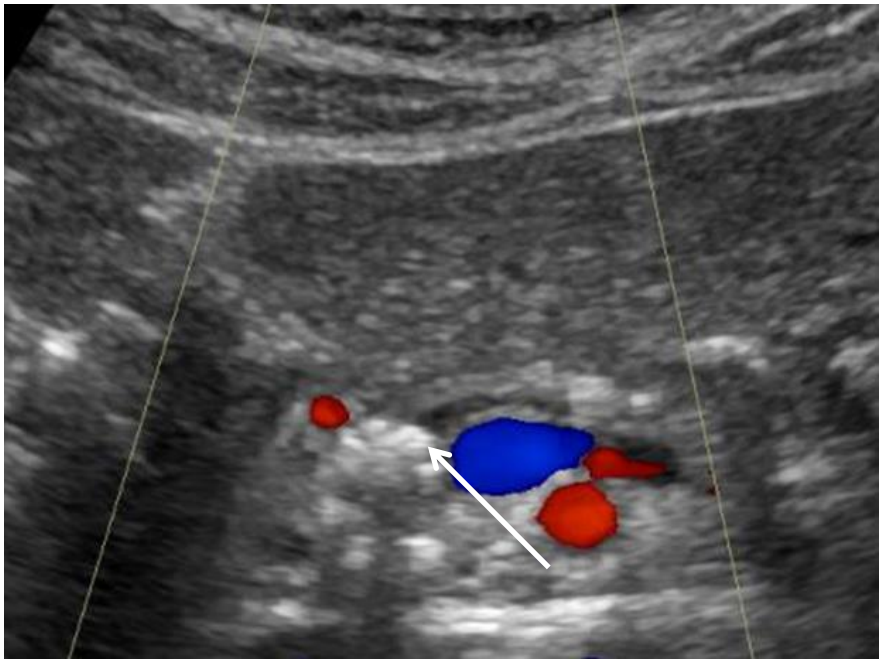
Intraductal filling defects/ calculi

- US with echogenic structure with acoustic shadowing or CT with hyperdense structures clearly located within MPD. Can be considered in all segments.
- MRI: Abrupt filling defects at MRCP/T2 weighted-MRI.

Intraductal filling defects or caliculi? ○ NOT evaluated ◉ No ○ Yes

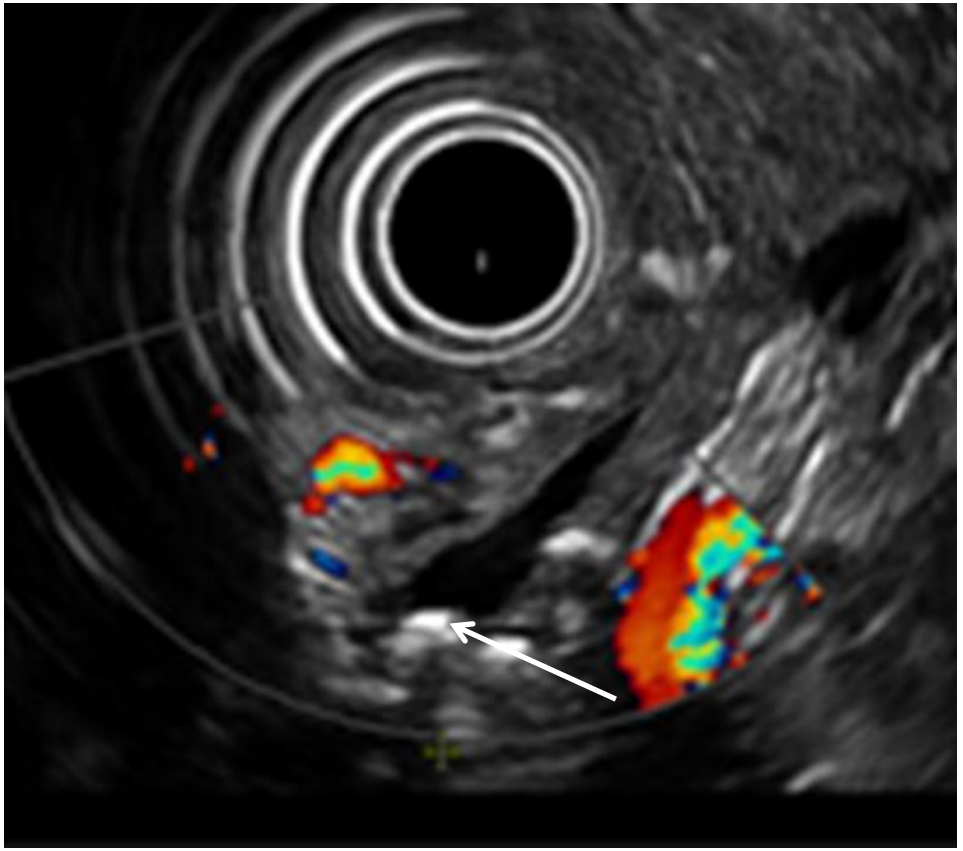
Intraductal caliculi

US



Hyperechoic intraductal lesion (arrow) with posterior shadowing

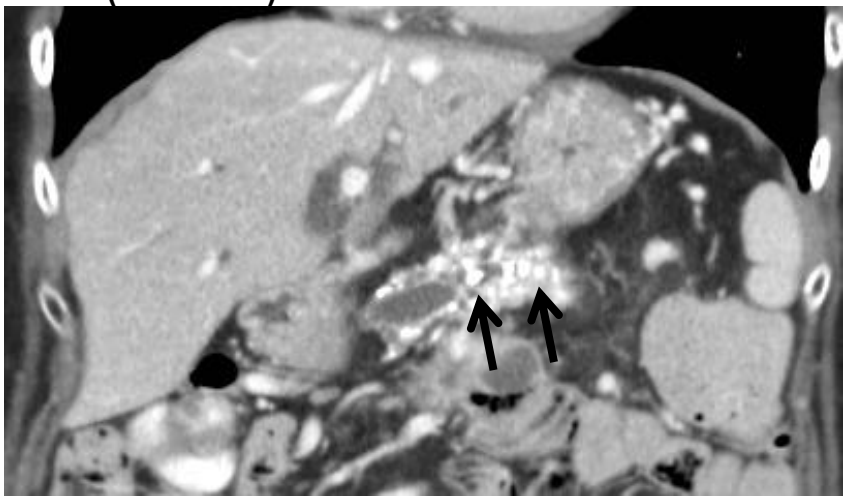
EUS



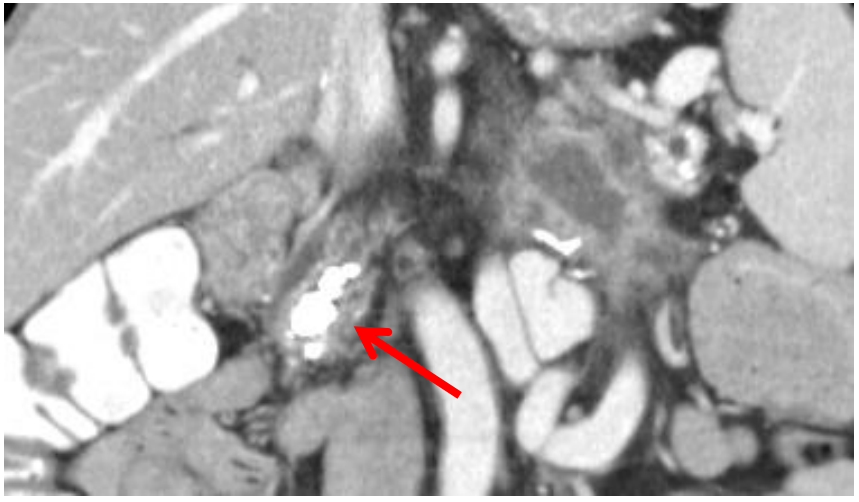
Hyperechoic intraductal lesion (arrow) with posterior shadowing

Intraductal caliculi

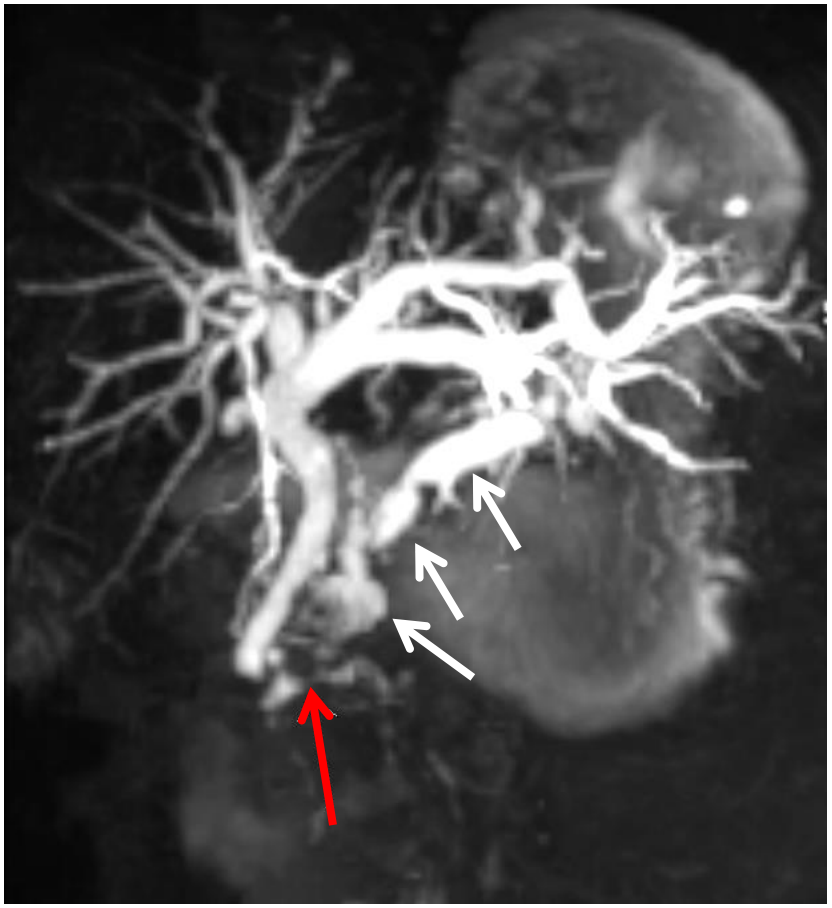
CT (+ i.v. CT) – coronal reconstruction



Intraductal hyperdens caliculi in the MPD of the pancreatic body (black arrows) and head (red arrow)



MRCP



Filling defect in MBD with hypointensity (red arrow; representing calculi) and with proximal dilatation of the MPD (white arrows) which exhibits irregular contour

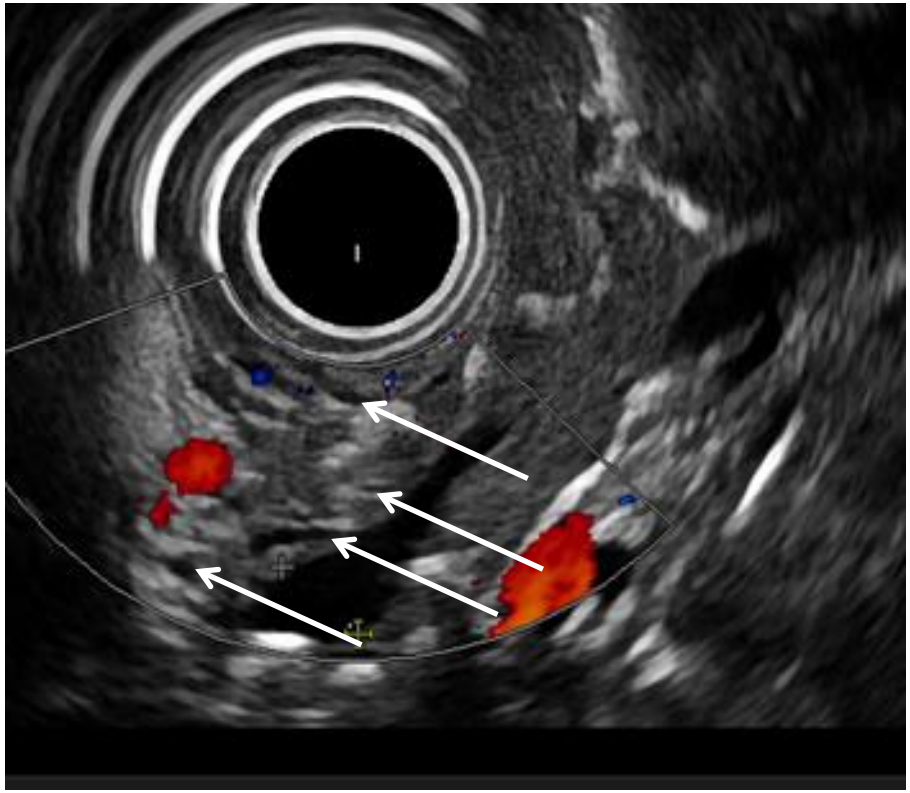
Dilated side ducts

- Tubular (anechoic on US) structures clearly visible and communicating with the MPD.
- Assessed typically in the pancreatic body and tail.
- If present, grade as moderate or marked.
- This feature is normally only detectable at EUS or MRCP

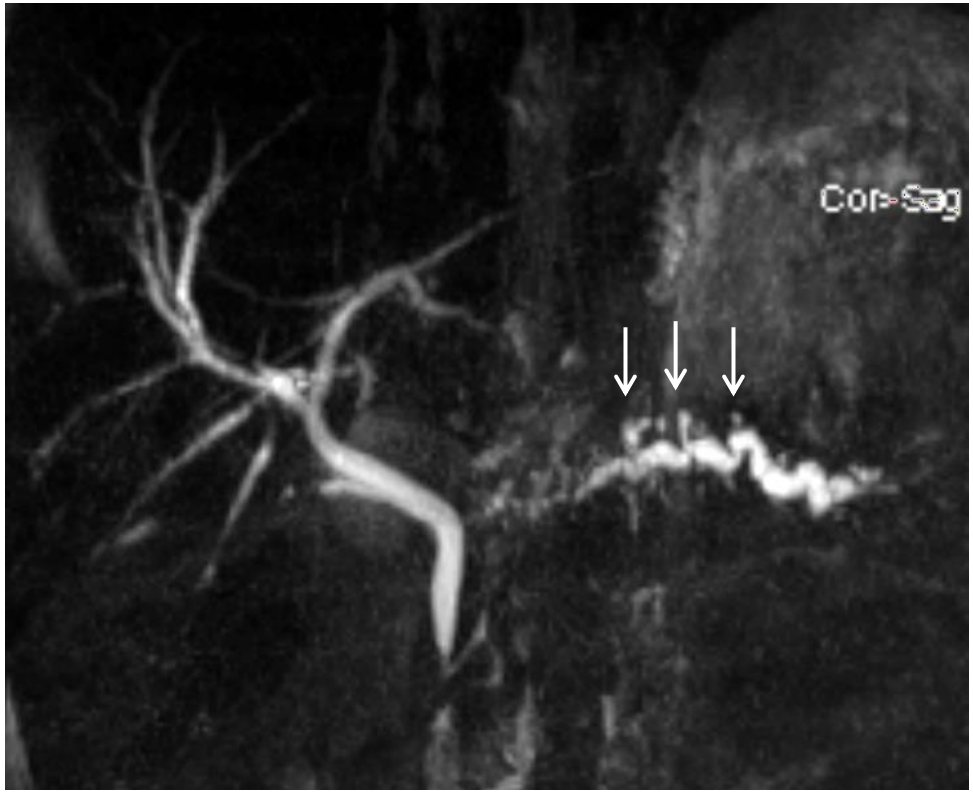
Dilated side ducts?	○ NOT evaluated ○ No ◉ Yes
No of dilated side ducts?	◉ Moderate (< 3 dilated side ducts) ○ Marked (≥3 dilated side ducts)

Dilated side ducts

EUS



MRCP



Dilated side ducts (arrows)
in the pancreatic body and tail

Pancreatic parenchymal morphology

Pancreatic PARENCHYMAL morphology	
Parenchymal calcifications?	○ NOT evaluated ○ No ◉ Yes reset
Parenchymal calcifications (number)	5 >15 stop count
Parenchymal calcifications (largest diam)	1 Diameter of largest calcification (mm)
(Pseudo) cysts?	○ NOT evaluated ○ No ◉ Yes reset
Pseudocysts (number)	
Pseudocysts (largest diam)	Diameter of largest pseudocyst (mm)
Gland size evaluated?	○ NOT evaluated ◉ Yes reset
Gland size HEAD (anterior-posterior diameter)	18 Largest anterior-posterior diameter HEAD (mm)
Gland size BODY (anterior-posterior diameter)	10 Largest anterior-posterior diameter BODY (mm) at level of arteria mesenterica sup
Irregular head/body contour?	○ NOT evaluated ◉ No ○ Yes reset Visual and subjective
Structure irregularity?	○ NOT evaluated ○ No ◉ Yes reset Visual and subjective. Not including diffuse lipomatosis
Continous organ invasion?	○ NOT evaluated ◉ No ○ Yes reset All regions. Visual and subjective.
Focal acute pancreatitis?	○ NOT evaluated ◉ No ○ Yes reset Visual and subjective.
Form Status	
Complete?	Complete

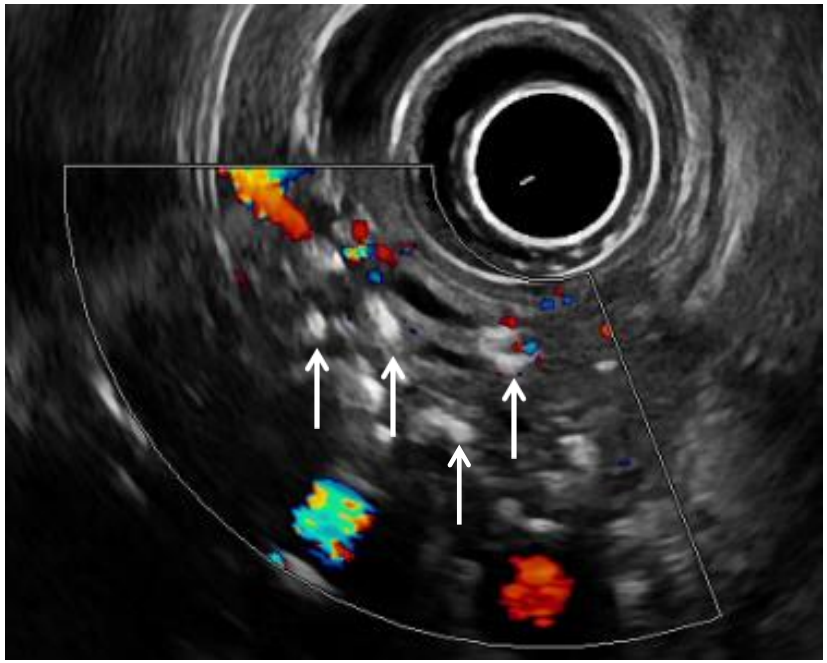
Parenchymal calcifications

- CT: Hyperdens parenchymal lesions.
  - SHOULD NOT BE CONFUSED WITH VESSEL CALCIFICATIONS
- EUS/US: Echogenic structures >1 mm in length and width that produce a shadow.
- MRI is unsuited to assess calcifications: Hence state NOT evaluated
- All calcifications >1mm (numbering ≤15 calcifications in total) should be counted (If more than 15 write > 15).
- Measure the largest calcification (longest axis)

Parenchymal calcifications?	○ NOT evaluated ○ No ◉ Yes reset
Parenchymal calcifications (number)	5 >15 stop count
Parenchymal calcifications (largest diam)	1 Diameter of largest calcification (mm)

Calcifications

EUS



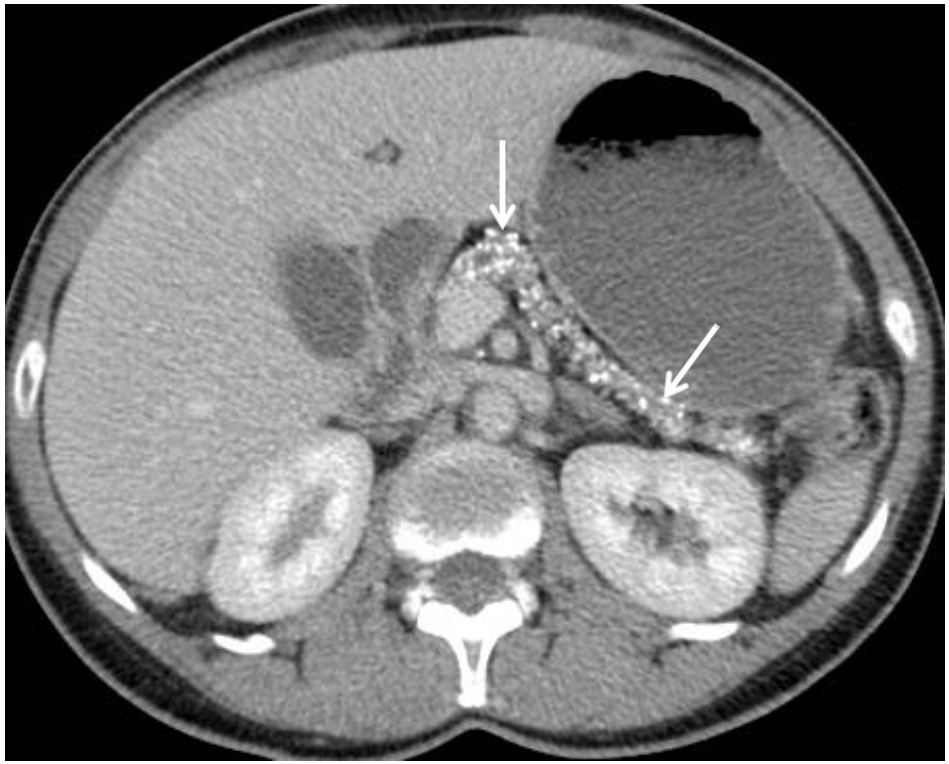
>15 calcifications, largest measuring 5 mm.

US

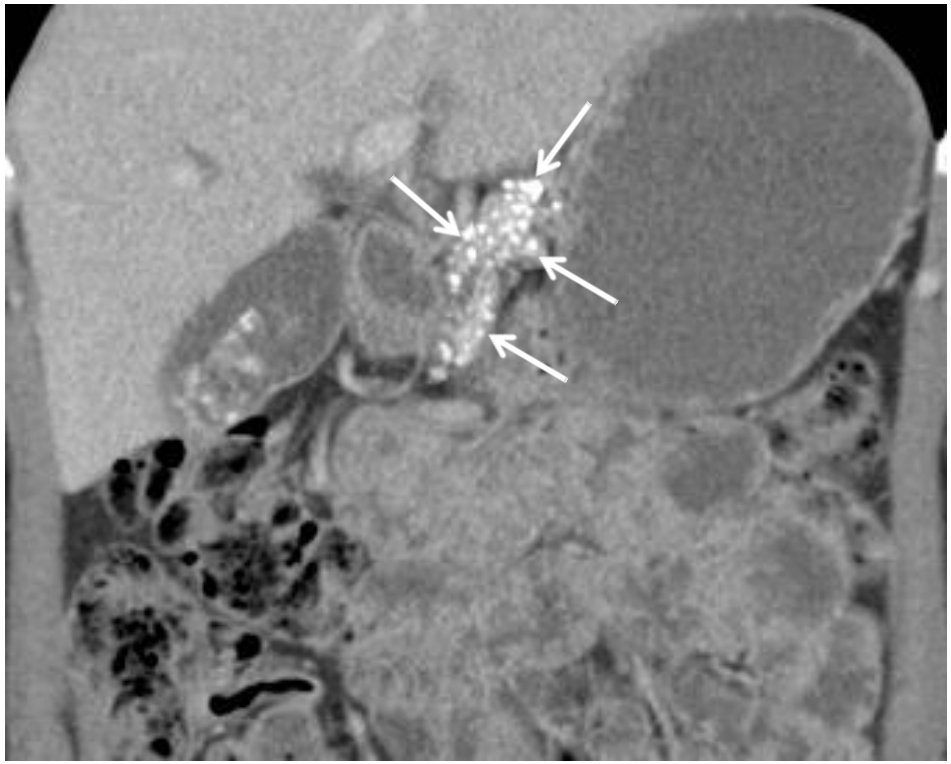
8 calcifications, largest measuring 10 mm.

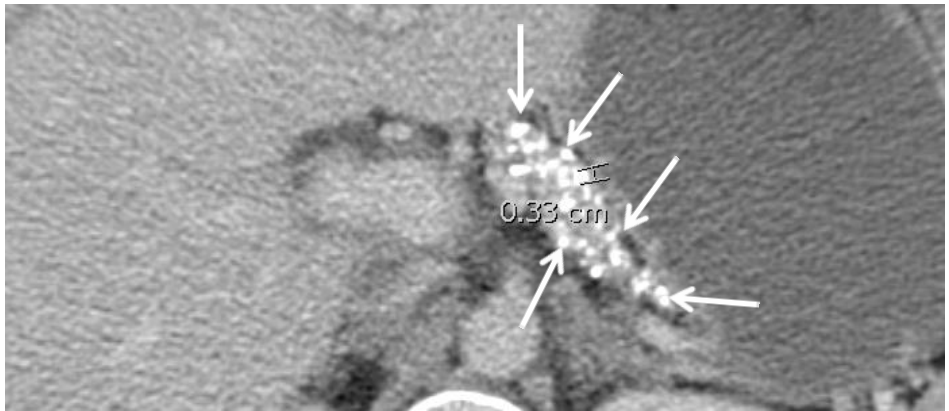
Calcifications

CT (+ i.v. C) axial



coronal reconstruction





>15 calcifications, largest measuring 3mm

(Pseudo) Cysts

- EUS: Anechoic, rounded/elliptic structures that should measure >2 mm in shortest axis
- MRI: hyperintense lesion on T2/MCRP
- CT: hypodens lesion
- Count and measure largest

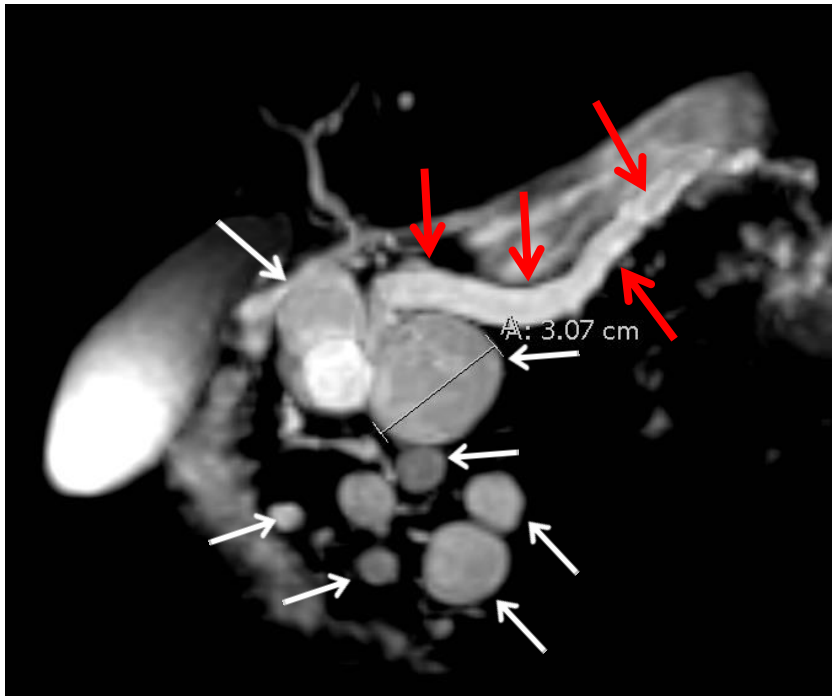
(Pseudo) cysts?	○ NOT evaluated ○ No ◉ Yes reset
Pseudocysts (number)	
Pseudocysts (largest diam)	Diameter of largest pseudocyst (mm)

(Pseudo) Cysts

CT (+ i.v. CT) axial

Hypodens cystic lesion (arrows) measuring 4.3 cm in the pancreatic tail.

MRCP



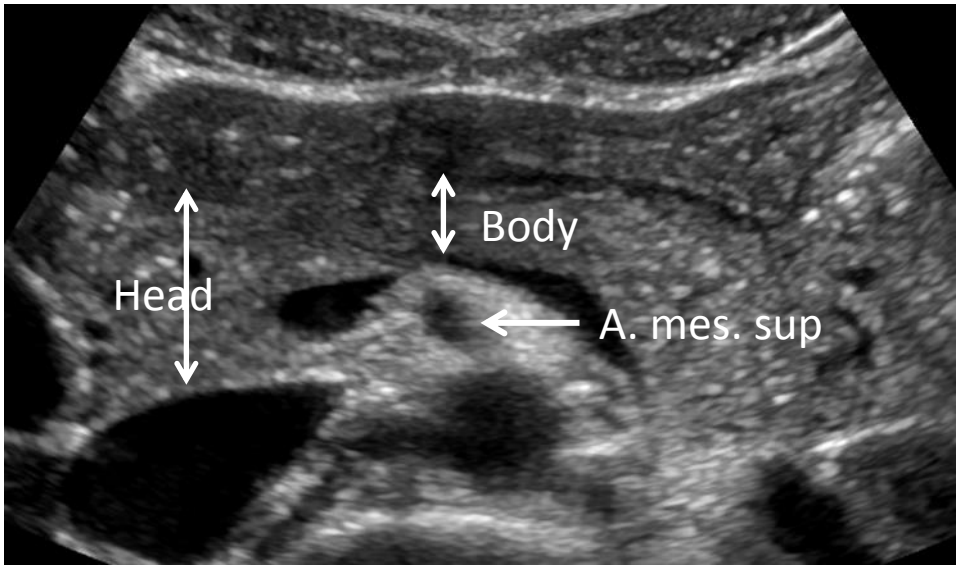
Multiple hyperintense cystic lesions (arrows) in the pancreatic head; largest measuring 3.1 cm. Note the dilated main pancreatic duct (red arrows)

Gland size

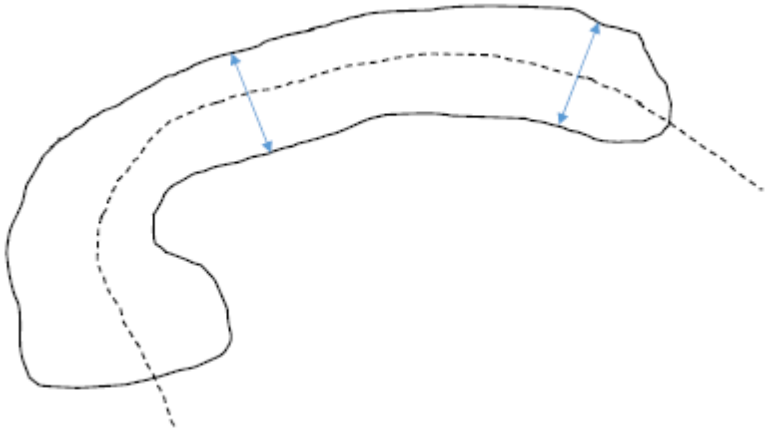
- Easiest to standardize measurements based on CT, MRI or US.
- Measure largest anteroposterior (AP) diameter in the axial plane of the pancreatic head and pancreatic body (at the level of a. mes. sup.)
- AP diameter should be perpendicular to the center axis of the pancreas

Gland size evaluated?	○ NOT evaluated ◉ Yes
Gland size HEAD (anterior-posterior diameter)	18 Largest anterior-posterior diameter HEAD (mm)
Gland size BODY (anterior-posterior diameter)	10 Largest anterior-posterior diameter BODY (mm) at level of arteria mesenterica sup

Pancreas size



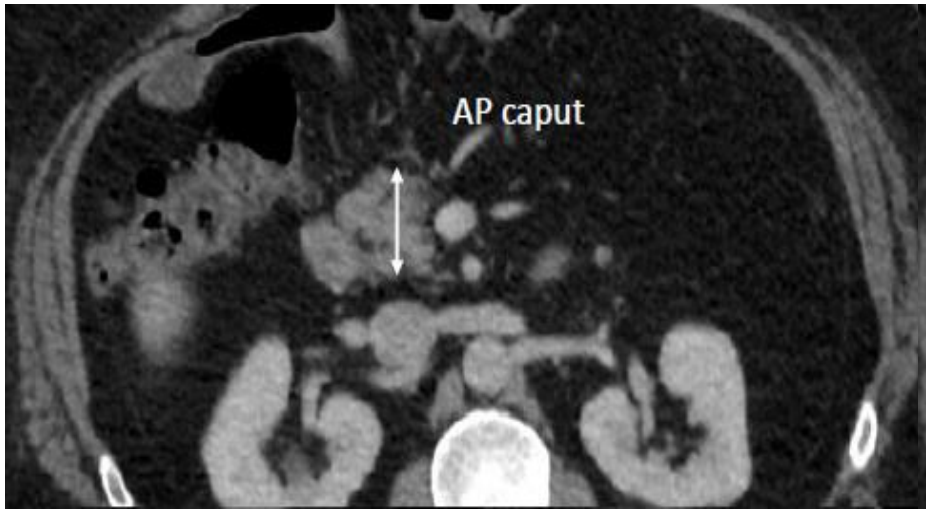
Suggested AP measures by US



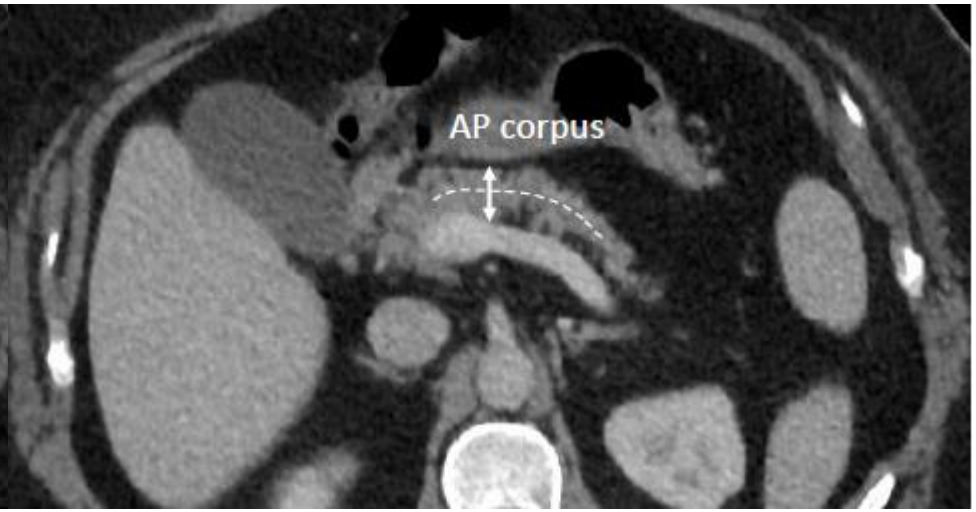
Measures on CT/MRI should be perpendicular to the pancreas axis

Gland size evaluated?	○ NOT evaluated ◉ Yes
Gland size HEAD (anterior-posterior diameter)	18 Largest anterior-posterior diameter HEAD (mm)
Gland size BODY (anterior-posterior diameter)	10 Largest anterior-posterior diameter BODY (mm) at level of arteria mesenterica sup

Measurements at CT (contrast-enhanced axial view)



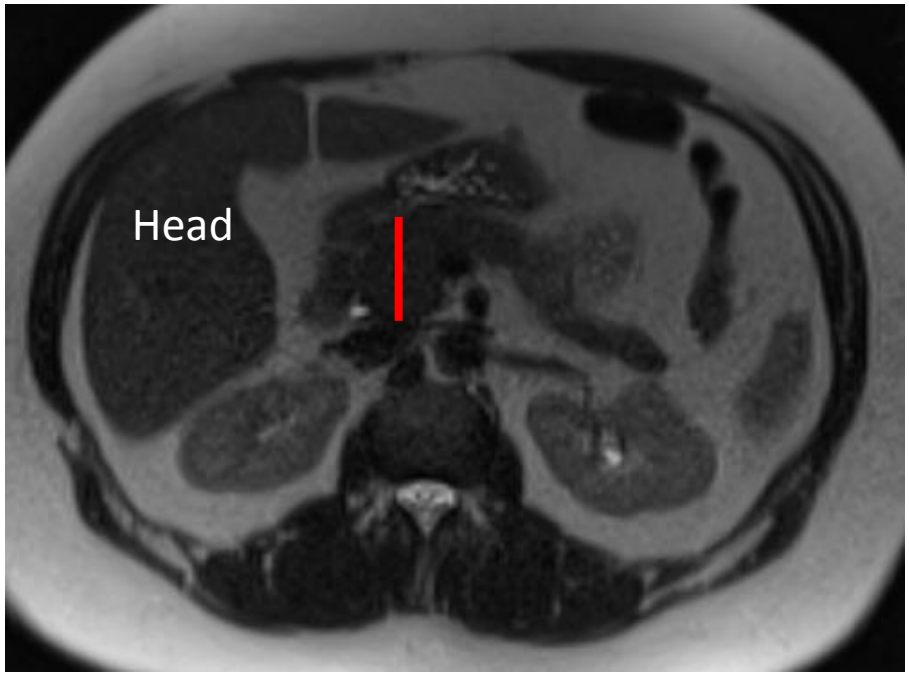
AP diameter (red line) of the pancreatic head



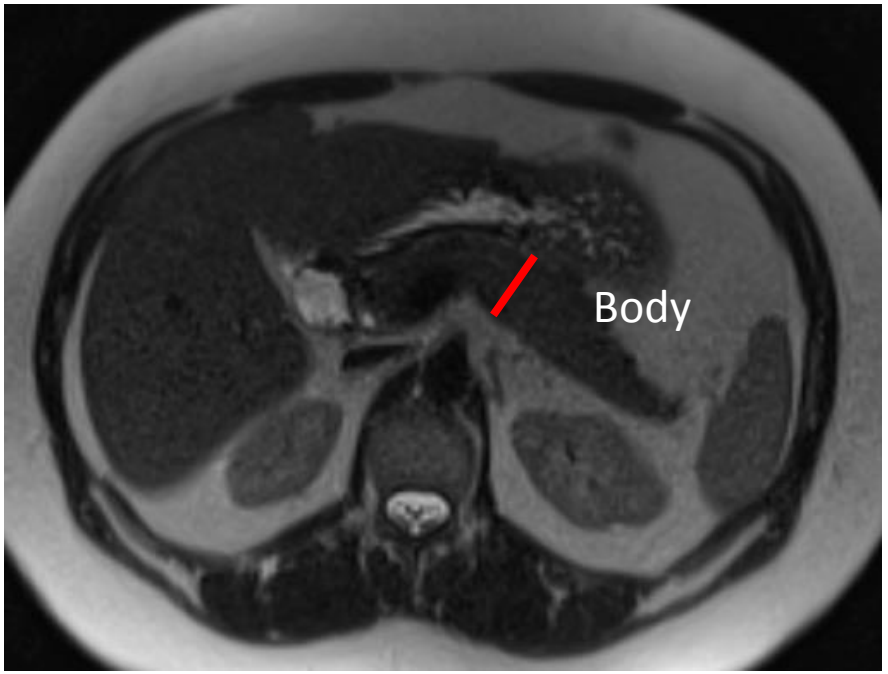
AP diameter (read line) of the pancreatic body perpendicular to the pancreatic axis.

Measurements at MRI

T2-weighted axial images



AP diameter (red line) of the pancreatic head in normal sized pancreas



AP diameter (red line) of the pancreatic body in normal sized pancreas

Visual and subjective criteria

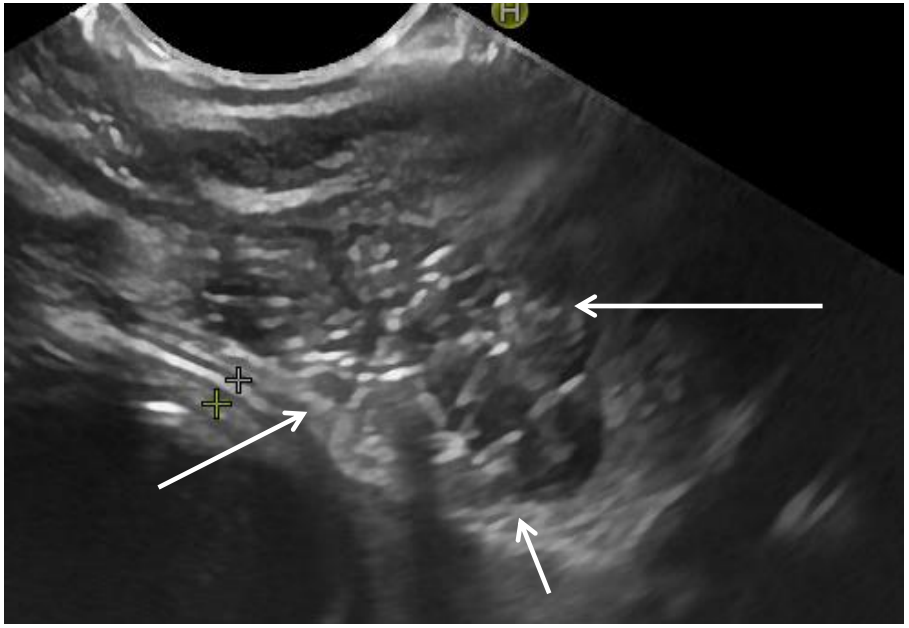
- These criteria are scored in a subjective manner without strict definitions.
- All are scored as yes/no if deemed assessable.

Irregular head/body contour?	○ NOT evaluated ◉ No ○ Yes Visual and subjective	reset
Structure irregularity?	○ NOT evaluated ○ No ◉ Yes Visual and subjective. Not including diffuse lipometosis	reset
Continous organ invasion?	○ NOT evaluated ◉ No ○ Yes All regions. Visual and subjective.	reset
Focal acute pancreatitis?	○ NOT evaluated ◉ No ○ Yes Visual and subjective.	reset

Irregular contour

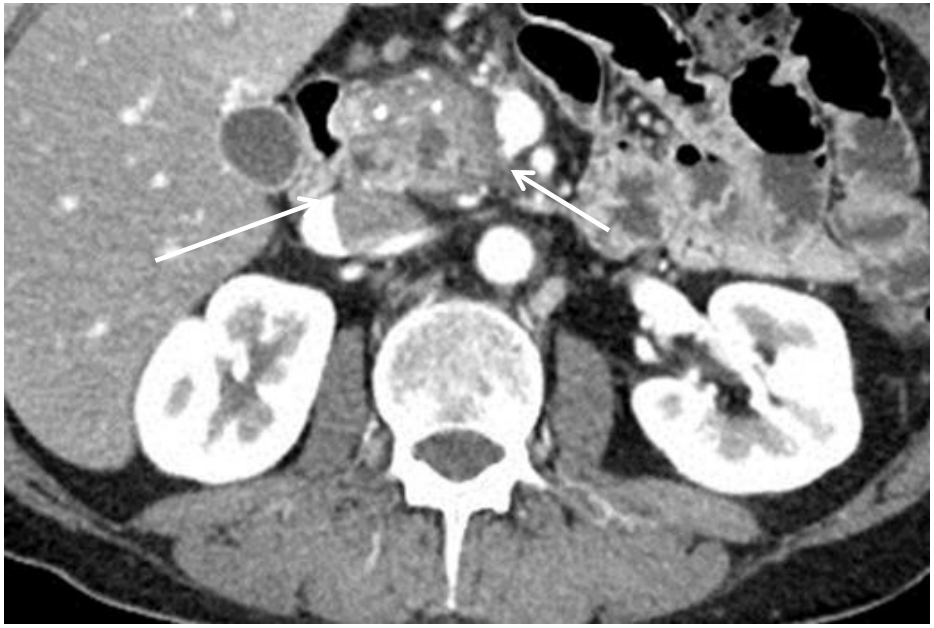
- Indistinct boundaries of the pancreas; may be focal or diffuse.
- Lobularity in EUS: Circumscribed >5 mm structures with rims hyperechoic relative to its central areas. At least 3 lobules in the body or tail. (Honeycombing: When at least 3 of the lobules are contiguous).

EUS



Lobulation and stranding (Arrows indicate boundaries of a lobe)

CT

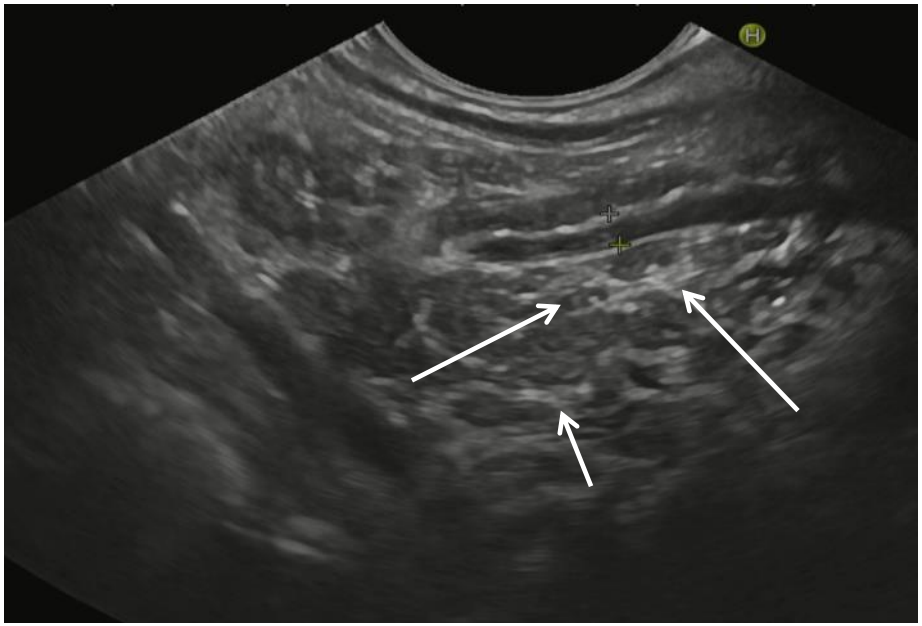


Focal indistinct boundary (Arrows) of the pancreatic head due to focal pancreatitis

Irregular structure

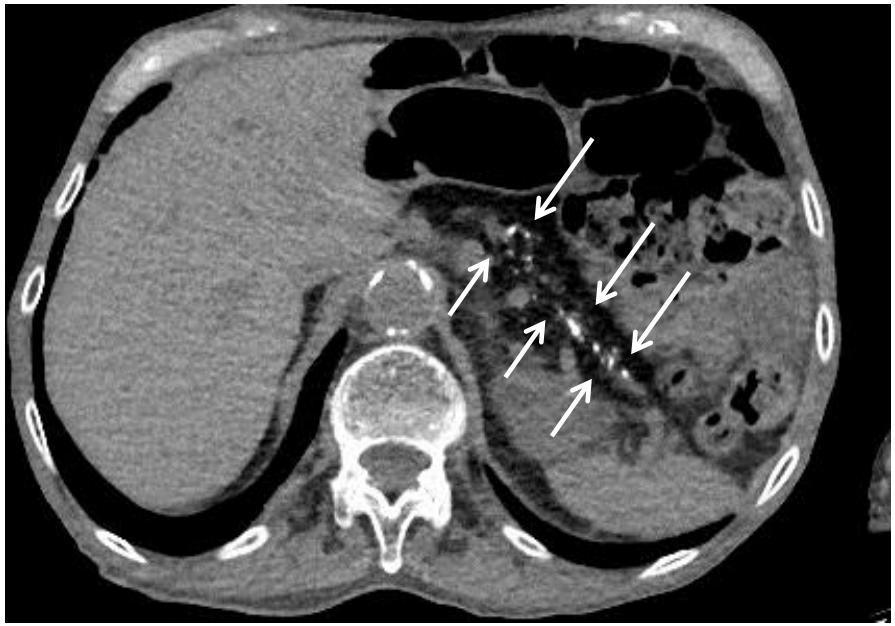
- Ranging from severe macrostructural rearrangement of the pancreas to minor features at EUS e.g. stranding, or at MRI e.g. diffuse fibrotic foci.
- Not including diffuse pancreatic lipomatosis

EUS



Fibrotic strands (Arrows)

CT

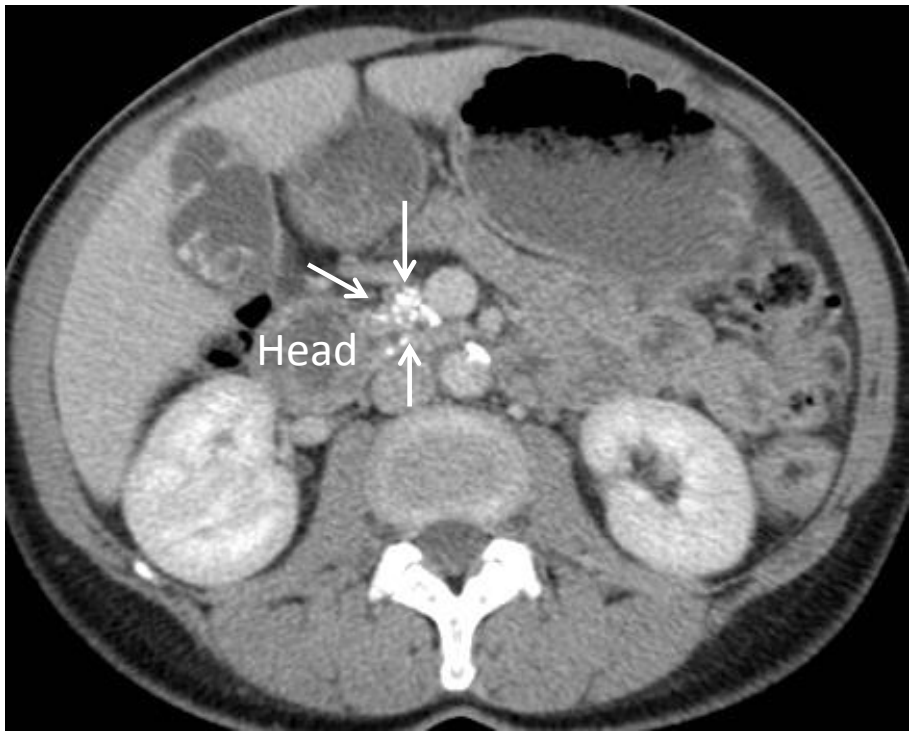


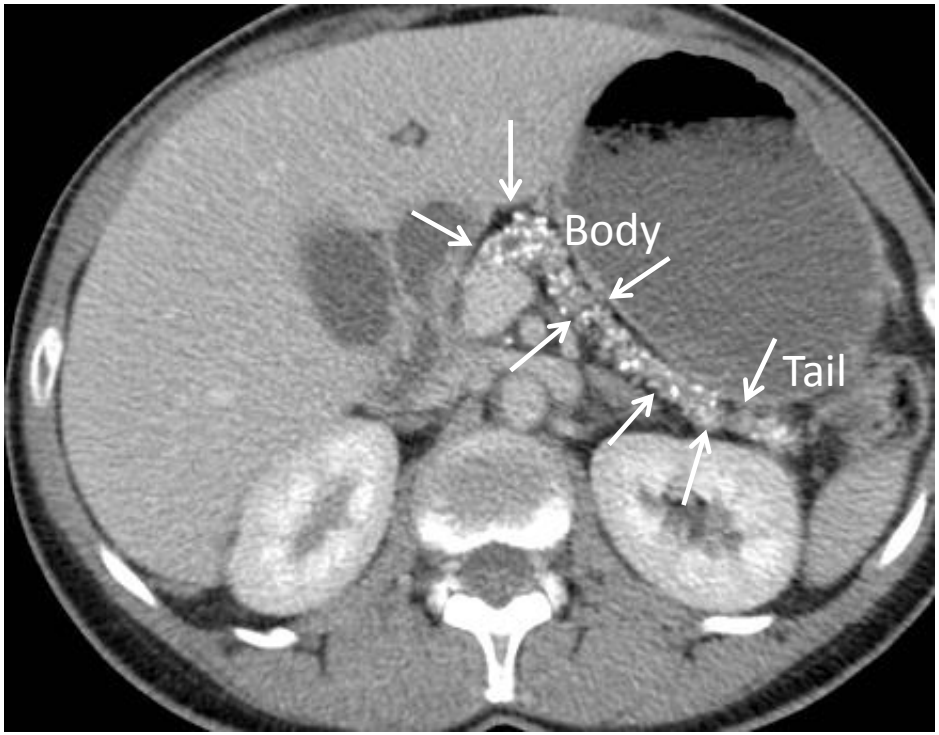
Severe atrophy and irregular structure of the pancreatic body and tail (Arrows indicate pancreatic boundaries)

Continuous organ invasion

- If pathological changes are observed in all segments (including the head, body and tail)

CT with i.v. contrast

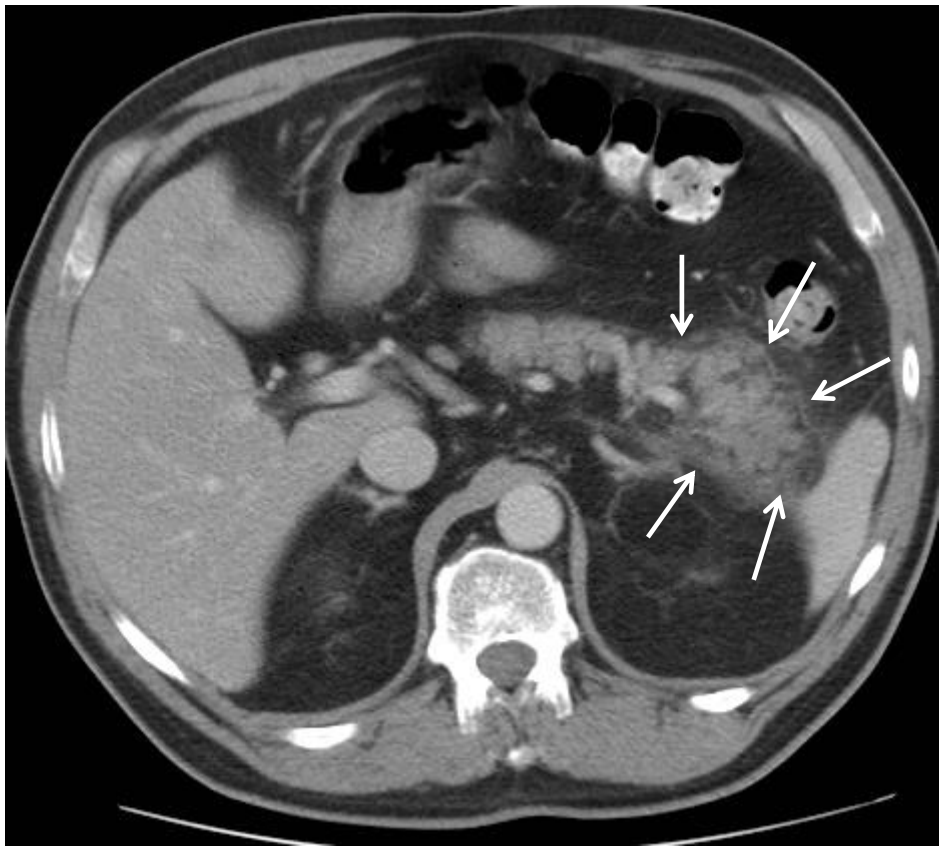




Pathologic changes in all segments of the pancreas with parenchymal calcifications and atrophy of the pancreatic head, body and tail.

Focal acute pancreatitis

- Focal changes in echogenicity/density/signal and/or perfusion.
- Focal peripancreatic changes suggesting inflammation



CT with i.v. contrast:

Pathologic changes in the pancreatic tail (arrows) which is enlarged and surrounded by fatty tissue with increased density, all suggesting local inflammation due to focal pancreatitis

Scores may be retracted from the module

SBPC Database Imaging module

Instructions for both: Mark the most recent radiological examination (modality) on which the CP diagnosis is based and check the criteria that apply

Pancreatic ductal morphology evaluated by ERCP or MRCP or EUS (Cambridge classific.)

Date of examination : ☐☐ ☐☐ ☐☐☐☐ (DD:MM:YYYY)

Based on ☐ MRCP ☐ S-MRCP ☐ ERCP ☐ EUS

		Classification	Main duct	Abnormal side branches	Additional features
☐	0	Normal	Normal	None	
☐	1	Equivocal	Normal	< 3	
☐	2	Mild	Normal	≥ 3	
☐	3	Moderate	Abnormal *	> 3	
☐	4	Marked	Abnormal *	> 3	One or more of the following: ☐ large cavity ☐ obstruction ☐ filling defects ☐ severe dilatation

* Abnormal = main pancratic duct diameter ≥ 4 mm

Pancreatic parenchymal and ductal morphology (M-ANNHEIM)

Date of examination : ☐☐ ☐☐ ☐☐☐☐ (DD:MM:YYYY)

Based on ☐ CT ☐ Transabdominal ultrasound ☐ MRI/MRCP ☐ EUS

Instructions:

1. Check mild and severe criteria that applies from the list below
2. Match number of criteria and severity with classification

Mild criteria:

- ☐ Main pancreatic duct enlarged (between 2 and 4 mm),
- ☐ slight gland enlargement (up to 2 x normal)
- ☐ heterogeneous parenchyma,
- ☐ small cavities (<10 mm),
- ☐ irregular ducts
- ☐ focal acute pancreatitis
- ☐ increased echogenicity of the main pancreatic duct wall
- ☐ irregular head/body contour

Severe criteria:

- ☐ large cavities (>10 mm)
- ☐ gross gland enlargement (>2× normal)
- ☐ intraductal filling defects or calculi
- ☐ duct obstruction
- ☐ structure or gross irregularity
- ☐ contiguous organ invasion

	Classification		Notes
☐	0 Normal		Main pancreatic duct <2 mm, normal gland size and shape, homogenous parenchyma
☐	1 Equivocal	1 mild criterion	
☐	2 Mild	≥ 2 mild criteria (+ normal main pancreatic duct)	
☐	3 Moderate	≥ 2 mild criteria (+ minor main duct abnormality) →	minor main pancreatic duct abnormalities: ☐ enlargement between 2 and 4 mm ☐ increased echogenicity of the duct wall
☐	4 Marked	as above + ≥ 1 severe criteria	

Good luck!

Recommended references:

1. Catalano MF, Sahai A, Levy M, Romagnuolo J, Wiersema M, Brugge W, et al. EUS-based criteria for the diagnosis of chronic pancreatitis: the Rosemont classification. GastrointestEndosc. 2009;69(7):1251-61.
2. Schneider A, Lohr JM, Singer MV. The M-ANNHEIM classification of chronic pancreatitis: introduction of a unifying classification system based on a review of previous classifications of the disease. JGastroenterol. 2007;42(2):101-19.
3. Schreyer AG, Jung M, Riemann JF, Niessen C, Pregler B, Grenacher L, et al. S3 guideline for chronic pancreatitis - diagnosis, classification and therapy for the radiologist. RoFo : Fortschritte auf dem Gebiete der Rontgenstrahlen und der Nuklearmedizin. 2014;186(11):1002-8.