

CT Imaging of Pancreatitis

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Pancreatitis & Collections

OLD WAY: Pancreatitis, pseudocyst, blah blah blah

NEW WAY: Revised Atlanta Criteria

Revised Atlanta Criteria

- Three (maybe 5) questions:

NO → Interstitial Edematous
Pancreatitis

1. Is there pancreatic
parenchymal **necrosis**? If
so, how much?

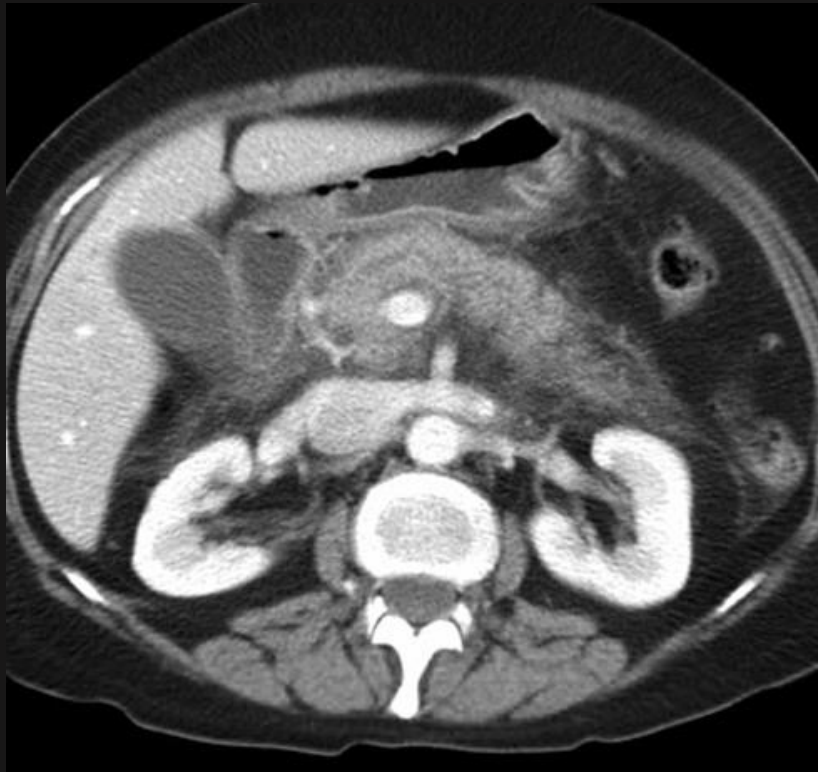
2. Is there a fluid collection?
If so, where is it?

3. How long ago did this
start?

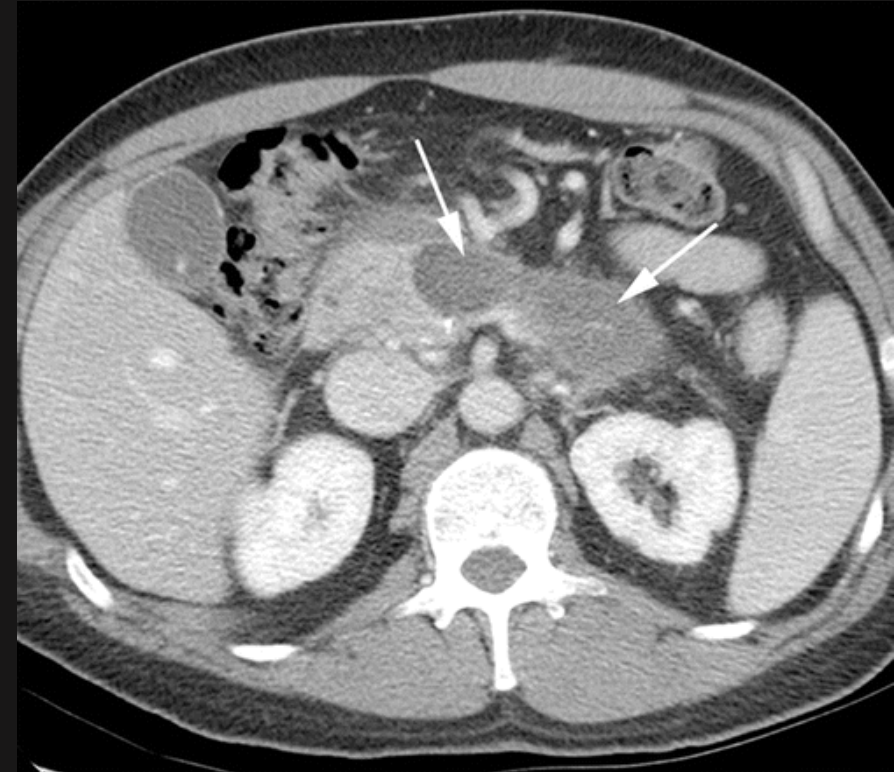
YES → Necrotizing pancreatitis
Greater or less than 30%?

Pancreatitis

IEP



NP



Revised Atlanta Criteria

- Three (maybe 5) questions:

NO → Congratulations

1. Is there pancreatic parenchymal necrosis? If so, how much?

YES →

2. Is there a fluid collection? If so, where is it?

IEP: must be peripancreatic, homogeneous

3. How long ago did this start?

NP: intra- and/or peripancreatic, heterogeneous

Revised Atlanta Criteria

- Three (maybe 5) questions:

1. Is there pancreatic parenchymal necrosis? If so, how much?
2. Is there a fluid collection? If so, where is it?
3. How long ago did this start?

< 4 weeks

IEP: Acute Peripancreatic Fluid Collection (APFC)

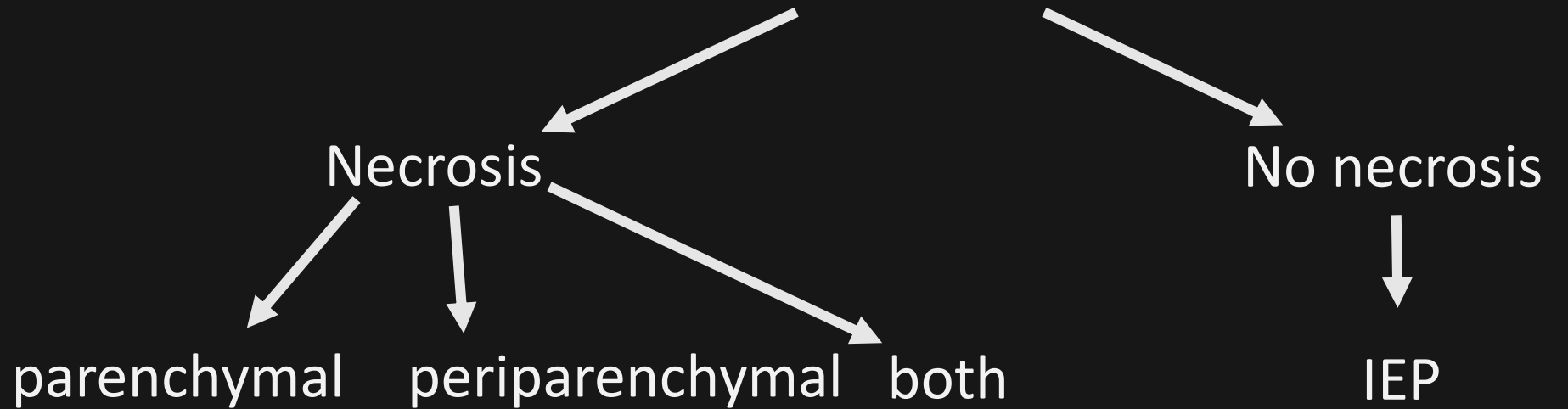
NP: Acute Necrotic Collection (ANC)

> 4 weeks

IEP: **Pseudocyst**

NP: Walled-off Necrosis (WON)

Pancreatitis



Early fluid collection
is called

ANC

ANC

ANC

APFC

Late fluid collection
is called

WON

WON

WON

Pseudocyst

“early” < 4 weeks < “late”

IEP = Interstitial edematous pancreatitis

ANC = Acute necrotic collection

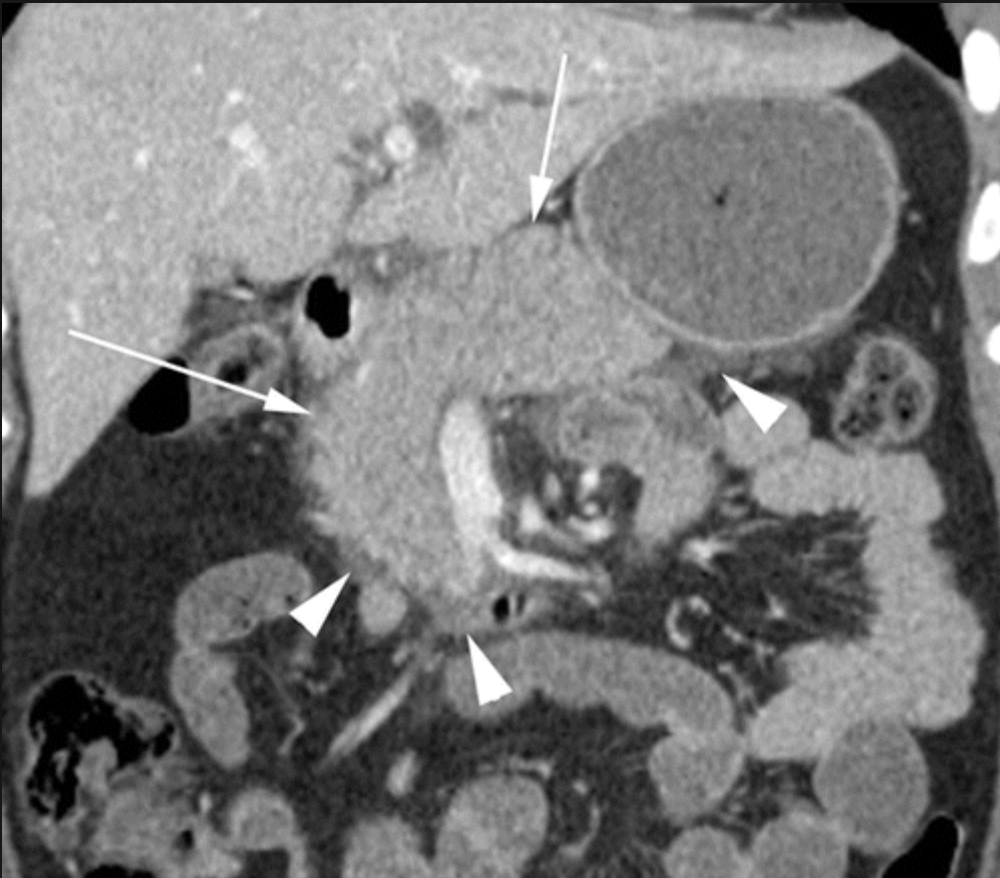
APFC = Acute peripancreatic collection

WON = Walled off necrosis

Why does it matter?

Type of Collection	Time (wk)	Necrosis	Location	Appearance	Infection	Drainage or Surgery
IEP						
APFC	≤4	No	Adjacent to pancreas, extrapancreatic only	Homogeneous, fluid attenuation, no liquefaction (debris), not encapsulated	Extremely rare	None
Pseudocyst*	>4	No	Adjacent or distant to pancreas	Homogeneous, fluid attenuation, no liquefaction (debris), encapsulated	Rare	Rarely (for infection or symptoms)
Necrotizing pancreatitis						
Sterile ANC	≤4	Yes	In parenchyma and/or extrapancreatic	Heterogeneous [†] , nonliquefied material, variably loculated, not encapsulated	No	Based on clinical, percutaneous drainage at times, surgery rarely [‡]
Infected ANC					Yes	Percutaneous drainage, surgery later if needed [‡]
Sterile WON	>4	Yes	In parenchyma and/or extrapancreatic	Heterogeneous [†] , nonliquefied material, variably loculated, encapsulated	No	Percutaneous drainage based on clinical, surgery to follow if needed [‡]
Infected WON					Yes	Percutaneous drainage/ surgery to follow if needed [‡]

IEP



- Localized or diffuse enlargement with normal homogeneous enhancement or **slightly heterogeneous enhancement**
- Mild inflammatory changes in the peripancreatic soft tissue
- Contrast-enhanced CT performed 5–7 days later permits definitive characterization.

IEP with APFC



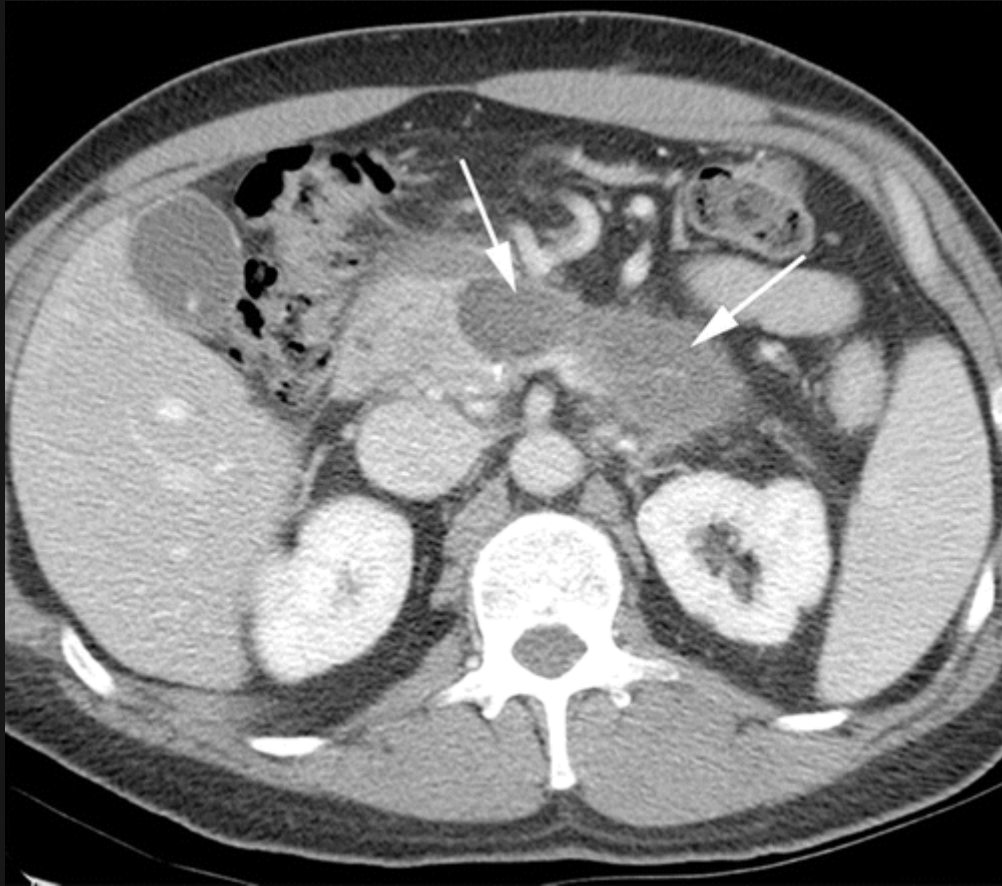
- Peripancreatic fluid collections with **exclusively liquid components** arising in patients with IEP during the first 4 weeks are referred to as APFCs.
- APFCs conform to the anatomic boundaries of the retroperitoneum and have **no discernable wall**.

Pseudocyst



- Within 4 weeks, an APFC may gradually transition into a pseudocyst.
- Well-circumscribed, usually round or oval *peripancreatic* fluid collections of homogeneously low attenuation that are surrounded by a well-defined enhancing wall

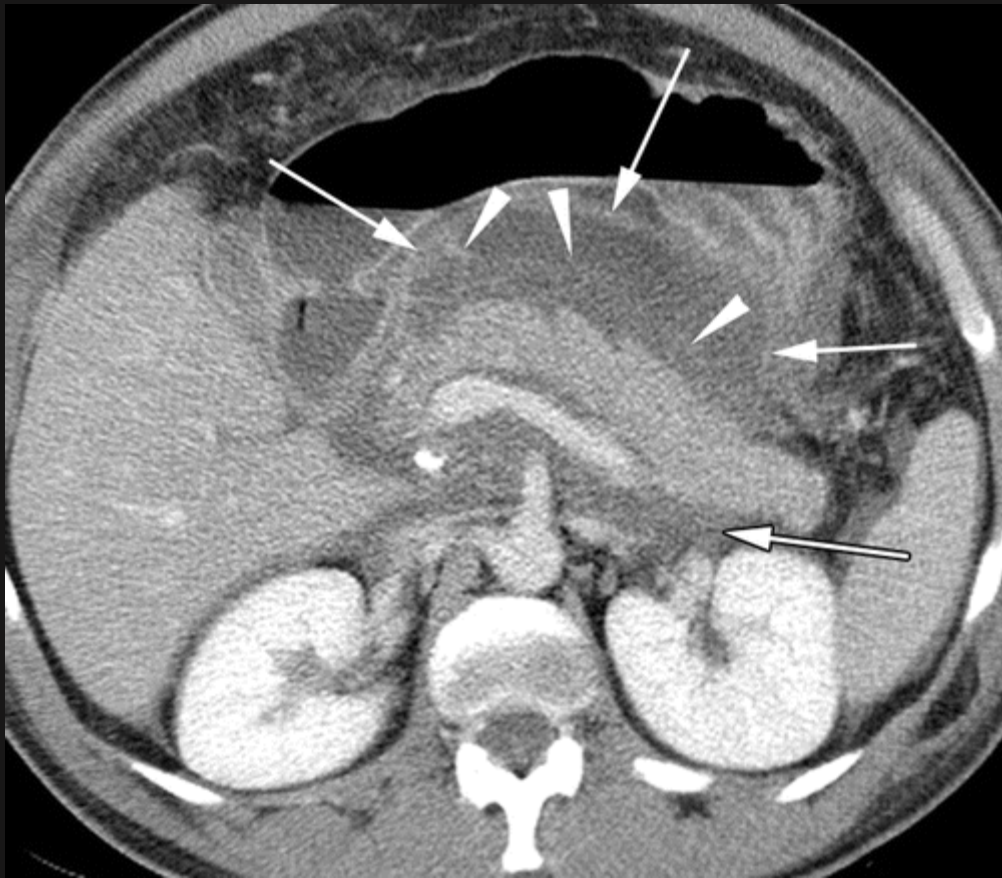
Parenchymal necrosis with ANC



- **Nonenhancing** area of variable attenuation
- In a newer modified CT grading system only two categories are distinguished: less than 30% and greater than 30%.
- A definitive diagnosis in these patients requires a follow-up study.

Fluid collections in the pancreatic parenchyma should be diagnosed as necrosis and not as APFCs.

Peripancreatic with ANC



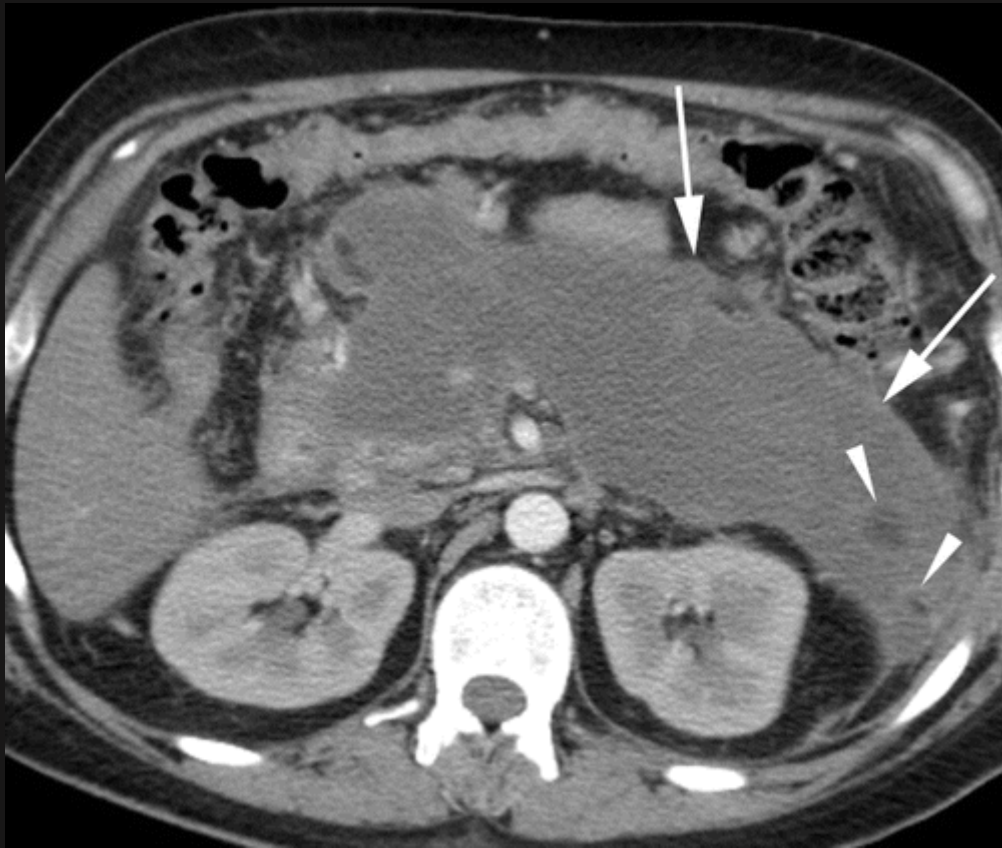
- Slightly edematous pancreas surrounded by fluid collections (arrows) containing **nonenhancing areas of variable attenuation and loculation** (arrowheads).
- Collections contain **nonliquefied** material.

Parenchymal and peripancreatic with ANC



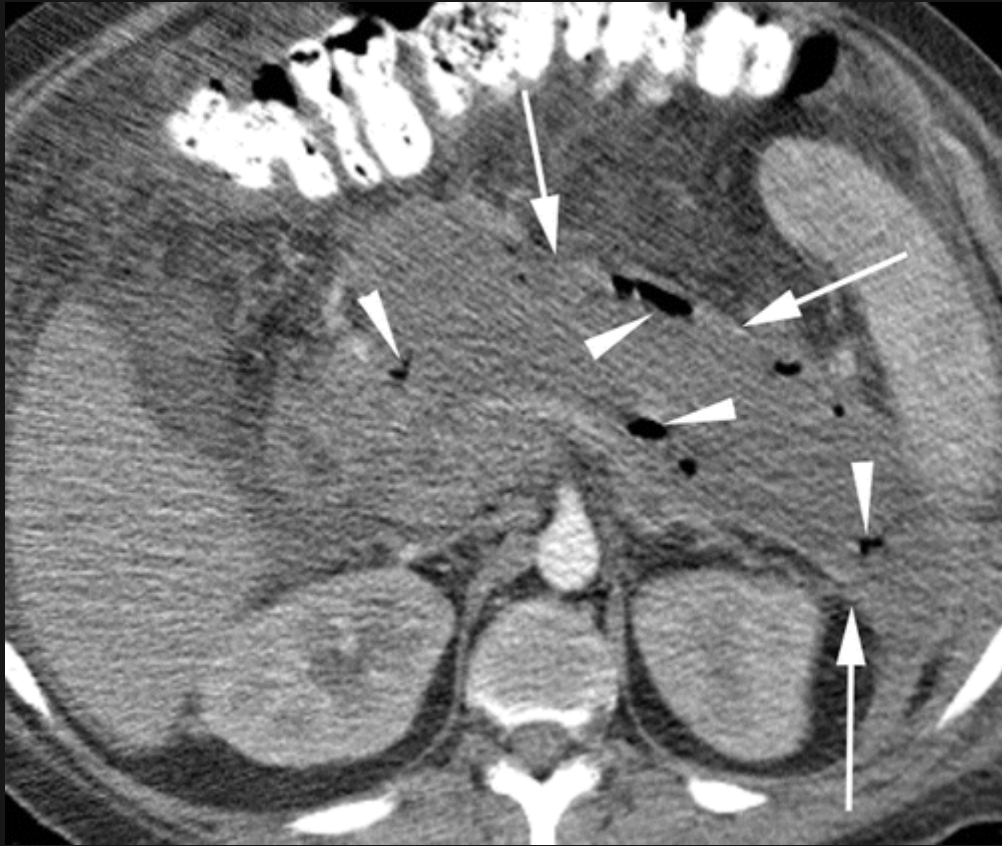
- Acute pancreatic parenchymal necrosis with peripancreatic necrosis is the **most common type of acute necrotizing pancreatitis**.
- Peripancreatic necrosis associated with full width necrosis of the pancreatic parenchyma may be connected to the main pancreatic duct.

Walled off Necrosis (WON)



- Over time, the ANC matures and develops a thickened nonepithelialized wall between the necrosis and the adjacent tissue.
- Like ANC, WON may involve the pancreatic parenchymal tissue and the peripancreatic tissue, the peripancreatic tissue alone or the pancreas alone.
- **Any apparent fluid collection that occupies or replaces portions of the pancreatic parenchyma should be called a WON after 4 weeks** from onset of necrotizing pancreatitis.
- In contradistinction to a pseudocyst, WON contains necrotic pancreatic parenchyma or necrotic fat.
- Most nonliquefied components need to be removed by means of a percutaneous image-guided approach, a laparoscopic or endoscopic procedure, or surgery.

Infected WON



- WON can become infected and contain variable amounts of debris and pus
- **Development of gas suggests gas-forming organism**
- **Communication with the GI tract mimics infection**
- Imaging and **clinical correlation** are critical

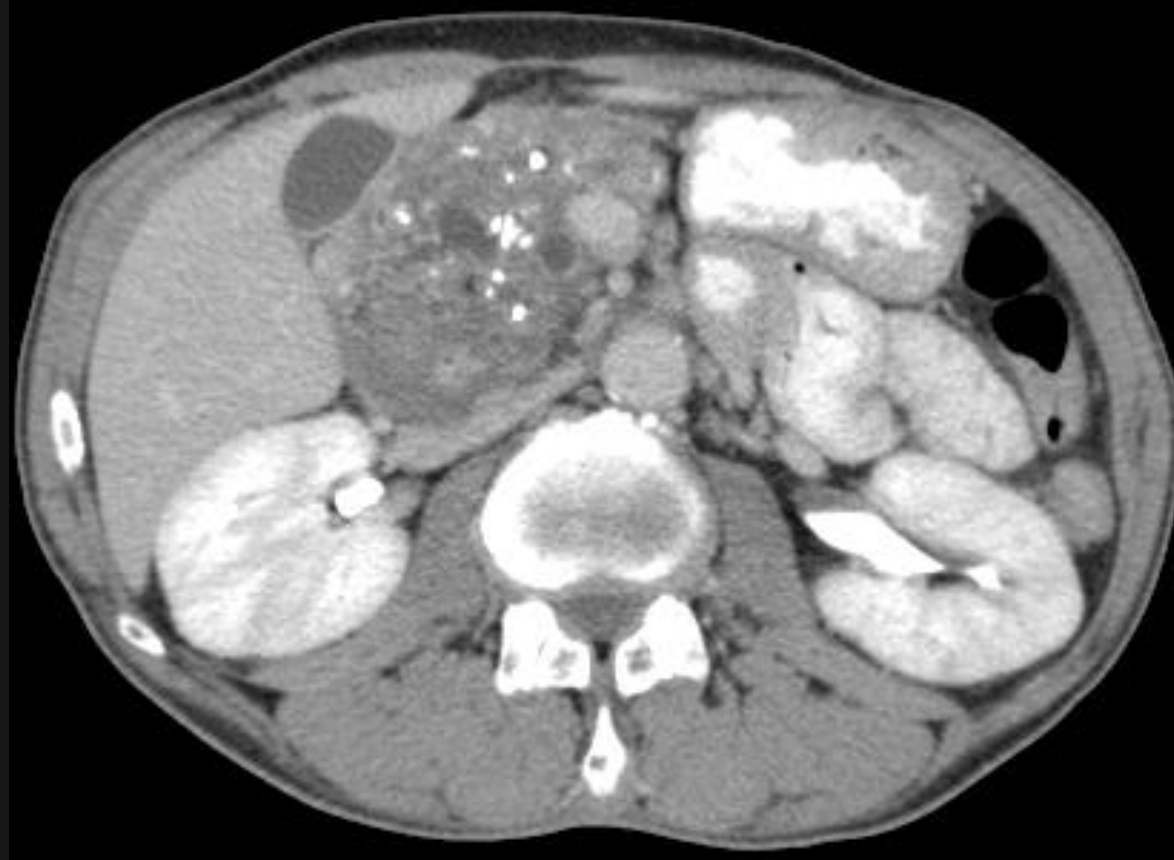
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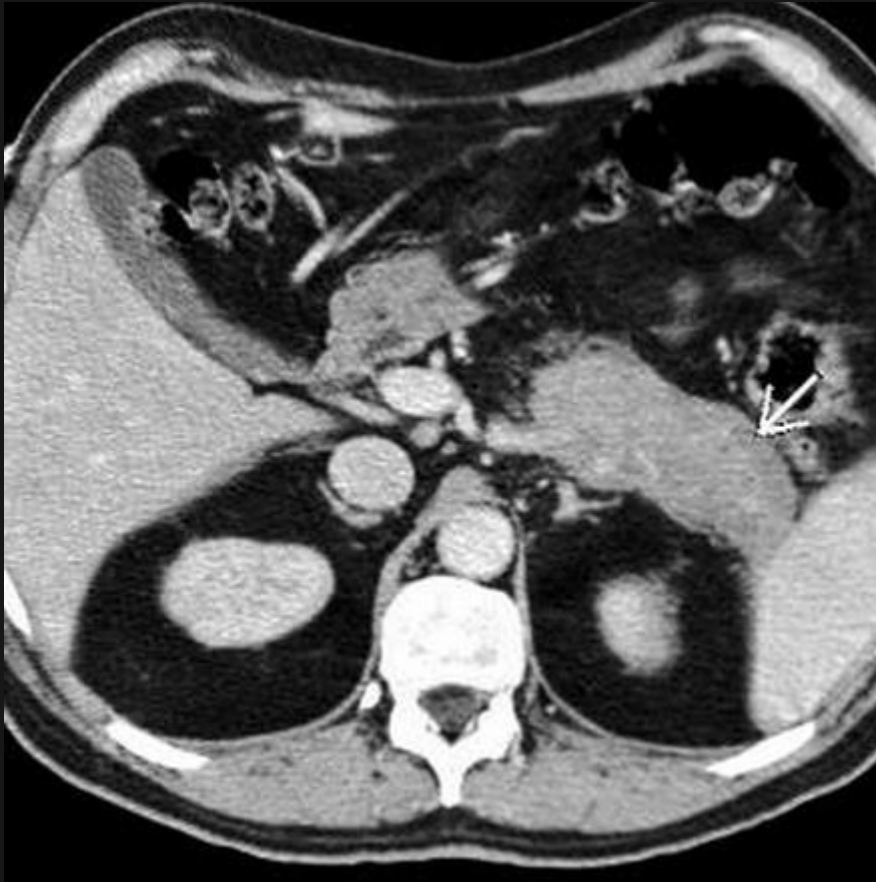
Chronic pancreatitis



Chronic masslike

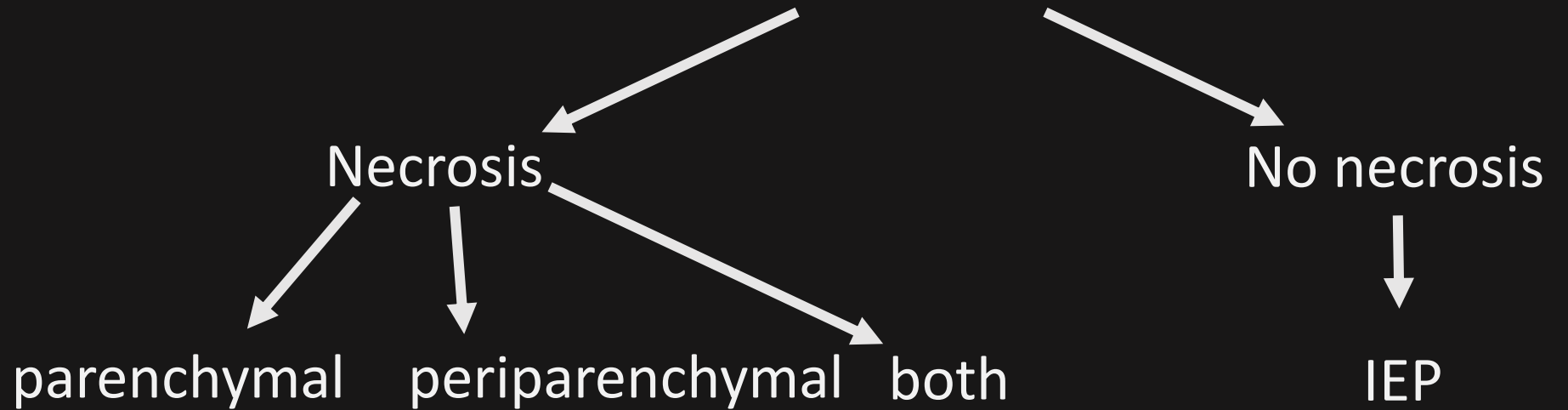


Autoimmune pancreatitis



- Focal or diffuse thickening
- Low attenuation halo
- Loss of fatty lobulation “sausage-like”
- Relatively little peripancreatic inflammation
- Much less pain than other forms of pancreatitis
- F < M

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ANC = Acute necrotic collection

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WON = Walled off necrosis

References

1. Statdx
2. Thoeni RF. The revised Atlanta classification of acute pancreatitis: its importance for the radiologist and its effect on treatment. *Radiology* 2012; 262(3):751-764.