DIAGNOSTIC CHALLENGES
Pancreas FNAB

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Oct 2017

CONFLICT OF INTEREST DISCLOSURE

- I have not had in the past 3 years, a financial interest, arrangement or affiliation with one or more organizations that could be perceived as a direct or indirect conflict of interest in the content of this presentation.

OBJECTIVES

After this session on pancreas eus fnab, should be able to:

- Recognize diagnostic approaches to complex cytological problems
- Expand knowledge & skills in interpretation of advanced cytology sampling techniques

AGENDA

- 2 cases
- Pancreas eus fnabs

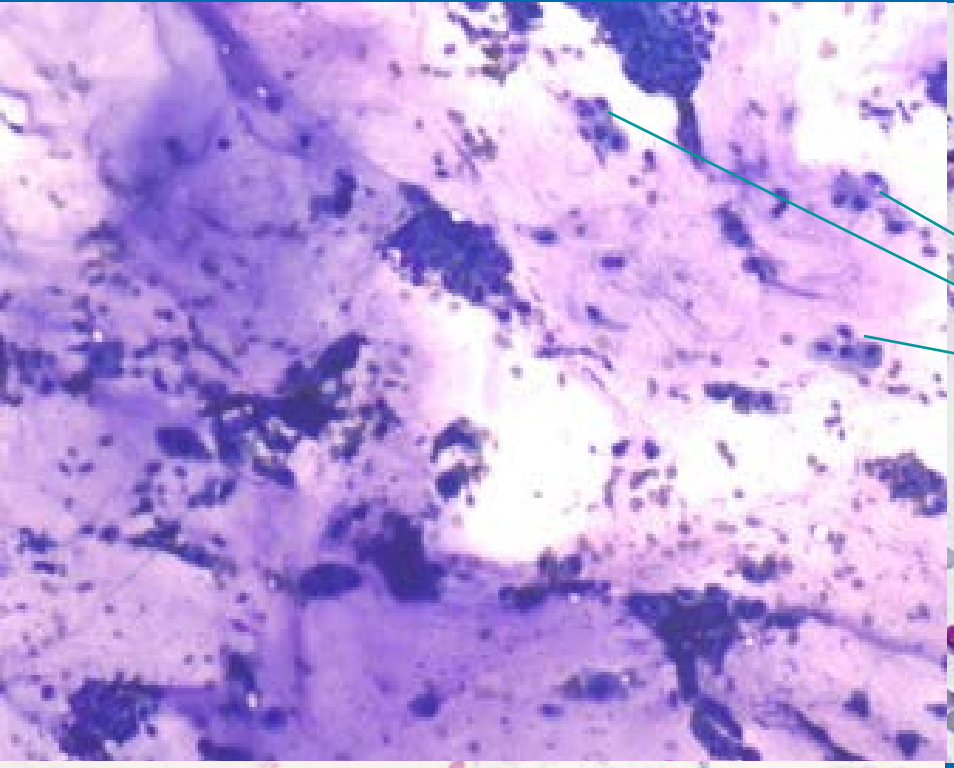
Photos:

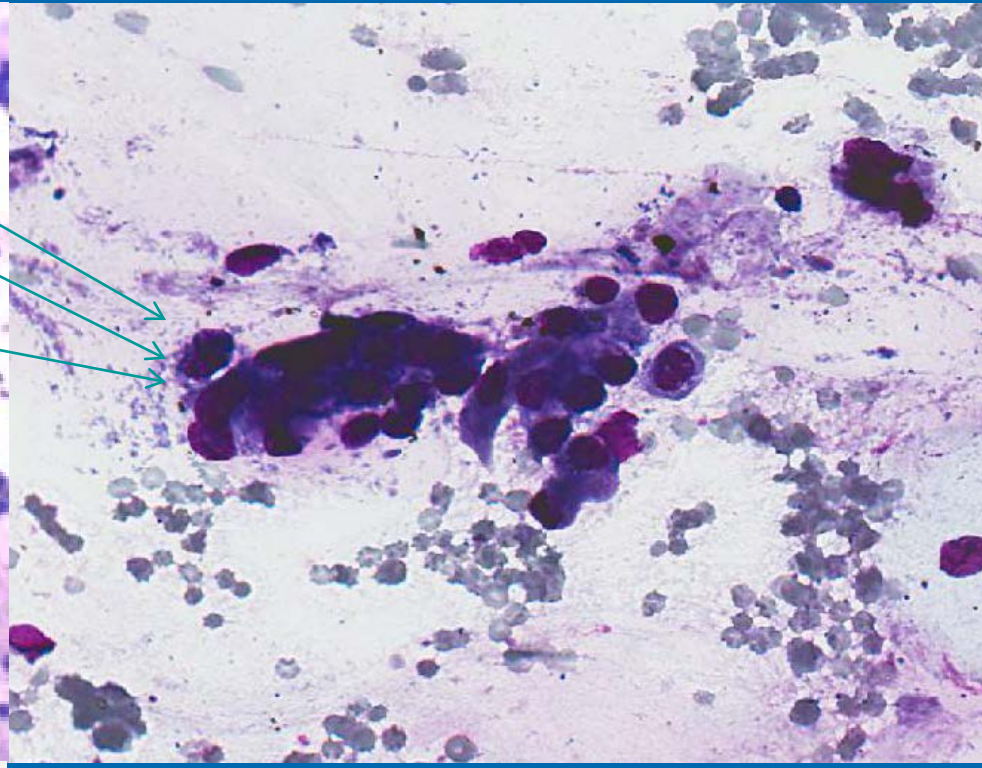
Hologic, PathologyOutlines, cytology.wordpress.com

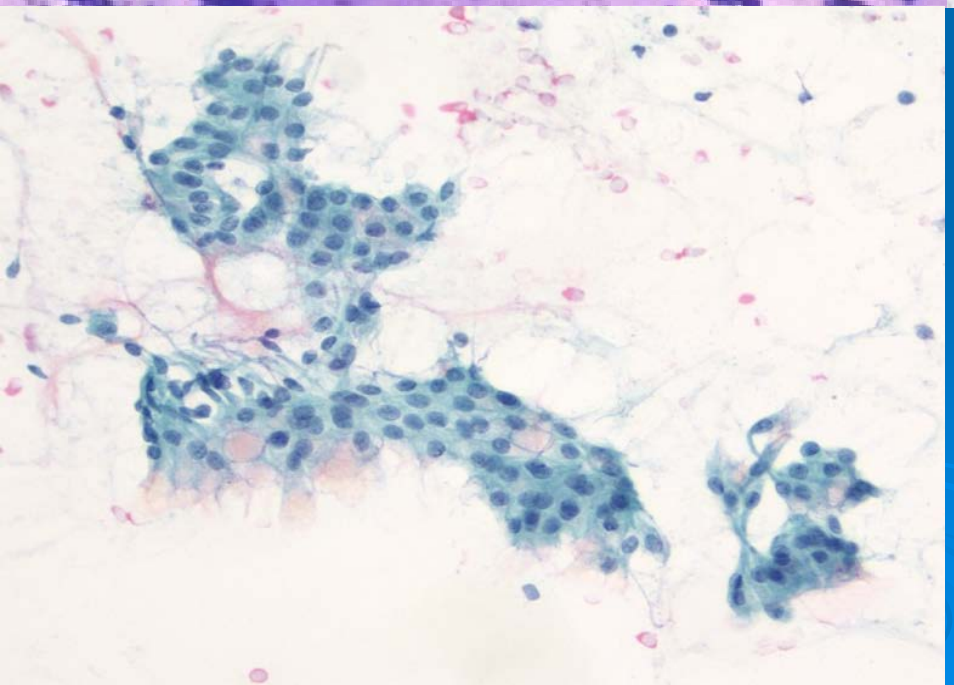
www.eurocytology.eu www.joplink.net www.pubcan.org, researchgate, PathPedia.com

Case 1

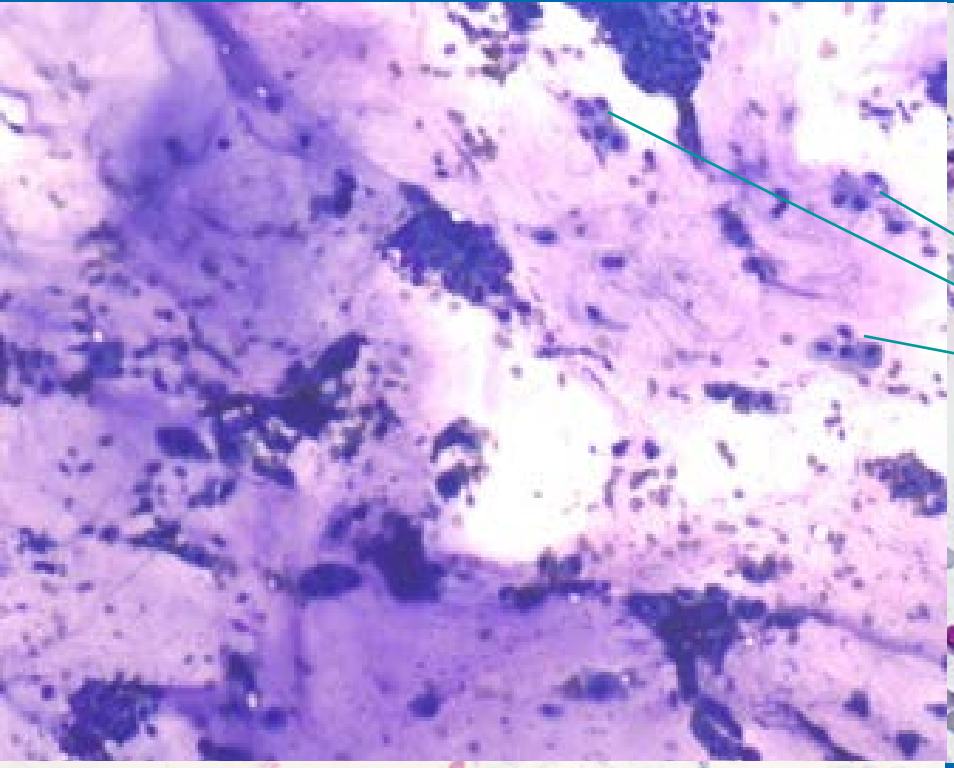
- 55 year old female
- Body of pancreas (BOP) mass
- Solid, 5 x 4 cm
- Transgastric EUS FNAB

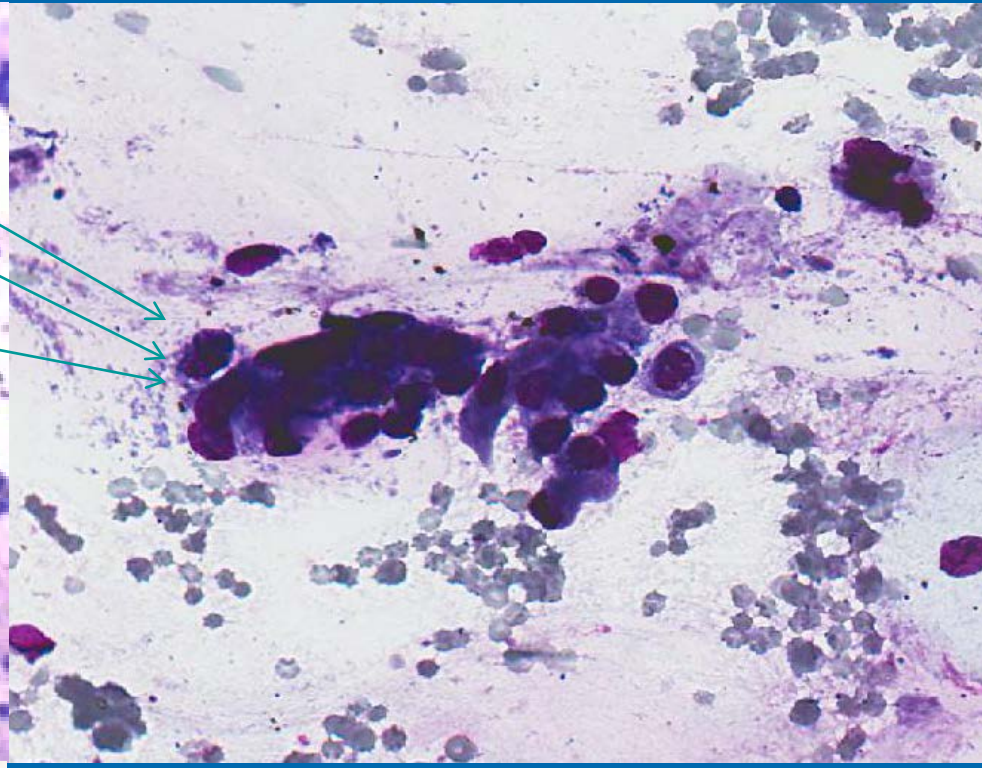


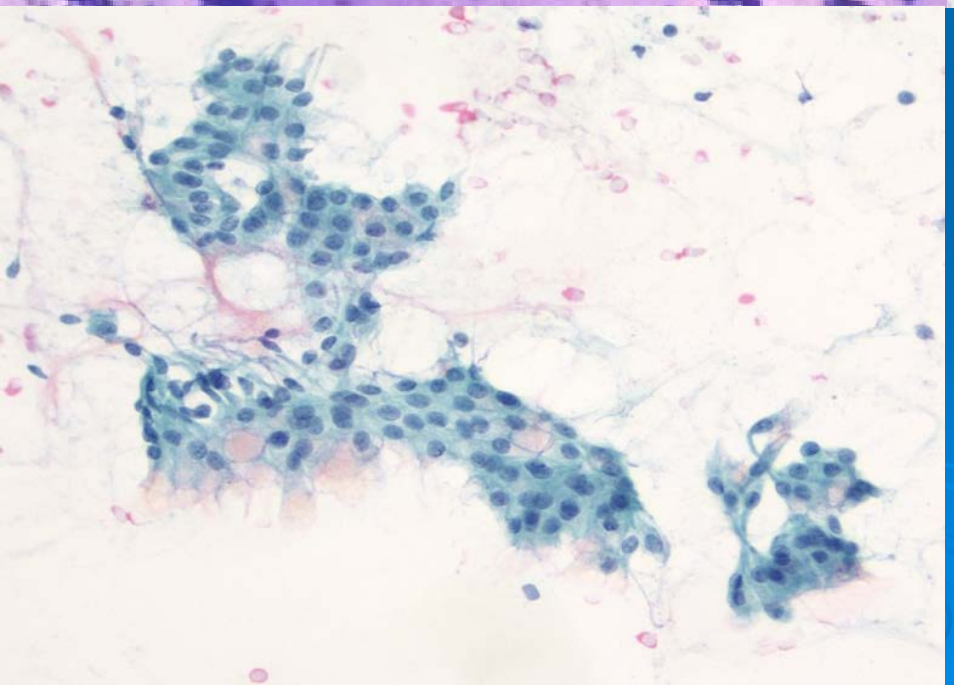




What is the pattern?







What is the pattern?

GLANDULAR

& ACINAR

What is your diagnosis?

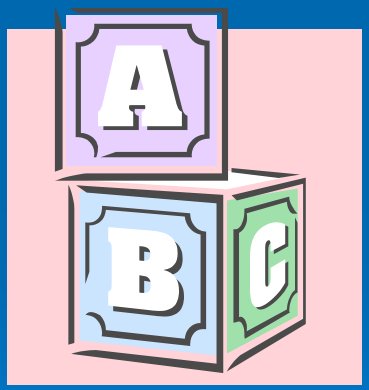
What is your diagnosis?

a) Neoplastic mucinous cyst
b) Gastric contamination
c) Pancreatic endocrine neoplasm
d) Acinar cell carcinoma
e) Solitary pseudopapillary neoplasm

Approach

- Clinical & imaging important
  - if solid – use algorithm for DDX

- Microscopic approach
  - Adequacy
    - Background
      - Contamination
        - Diagnosis



ALGORITHM:
Solid Pancreas Mass EUS FNAB

Non-neoplastic

- Normal contaminant
- Pancreatitis
  - chronic
  - autoimmune
  - acute
- Infection

Neoplastic

- Adenocarcinoma, ductal
- Pancreatic endocrine neoplasm
- Acinar cell carcinoma
- Solid pseudopapillary neoplasm
- Pancreaticoblastoma
- Metastasis

ALGORITHM: Acinar pattern

Non-neoplastic

- Normal contaminant
  - pancreas
- Pancreatitis

Neoplastic

- Pancreatic endocrine neoplasm
- Acinar cell carcinoma
- Solid pseudopapillary neoplasm
- Pancreaticoblastoma
- Metastasis

Other patterns: single cells, glandular, cystic

ADEQUACY: ROSE

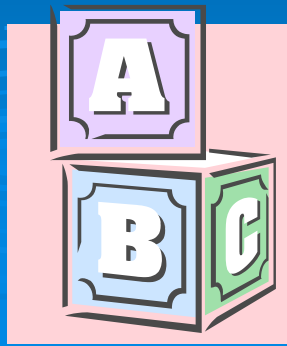
- Define adequacy to accommodate threshold differences in interpretation

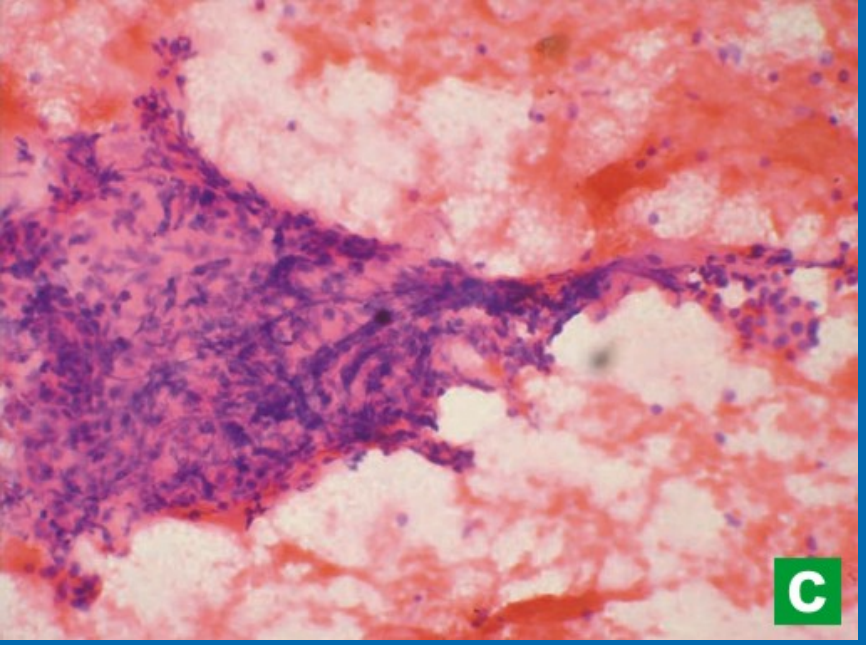
- Solid lesion:
  - Epithelial predominant: > 10 groups
  - Inflammation: may not be lesional

- Purpose: triage for ancillary studies

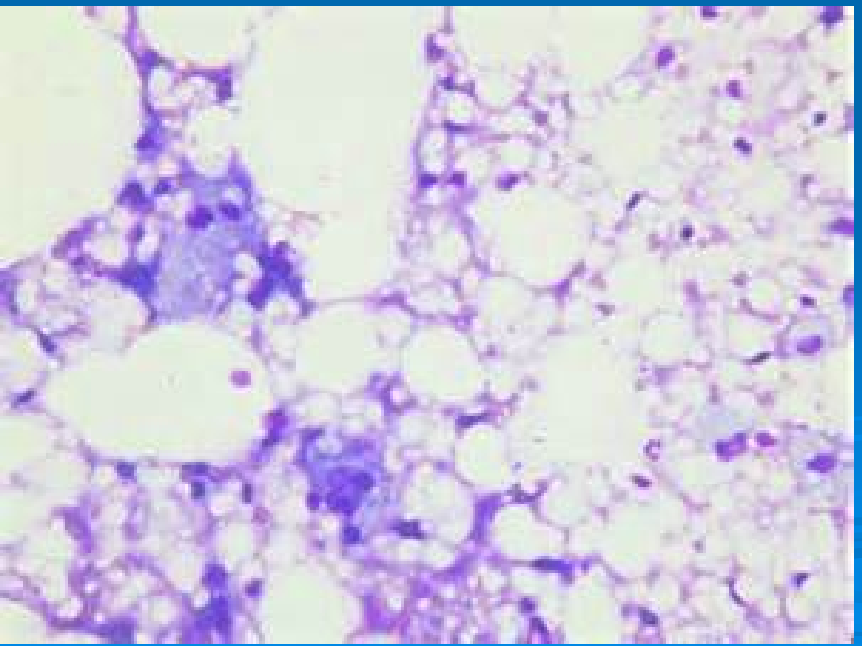
NEED cell block!

Do cores

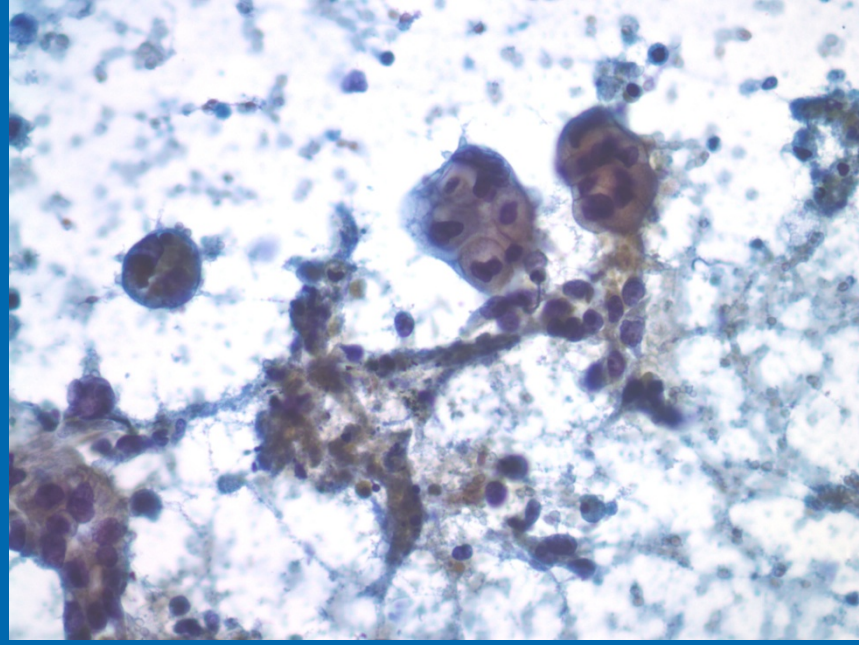




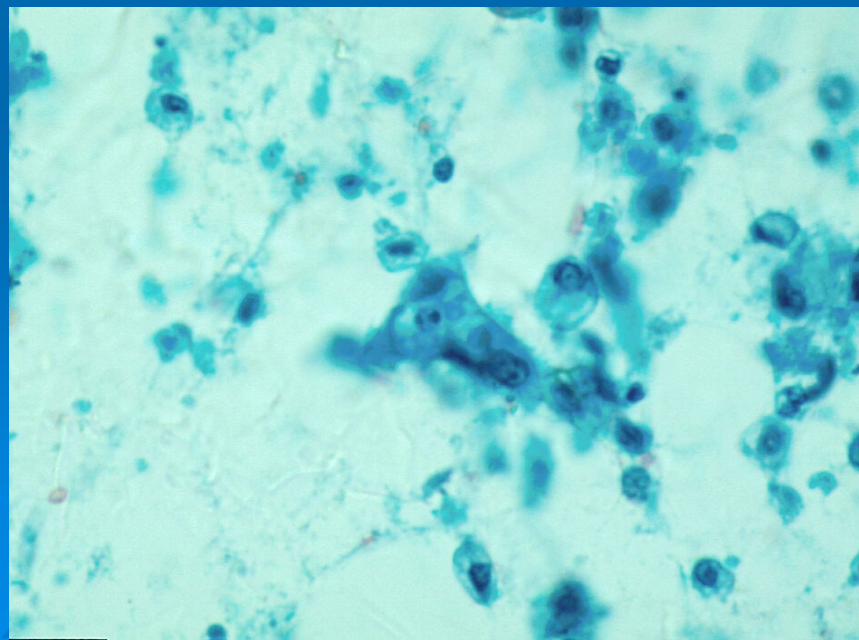
Fat necrosis & pancreatitis



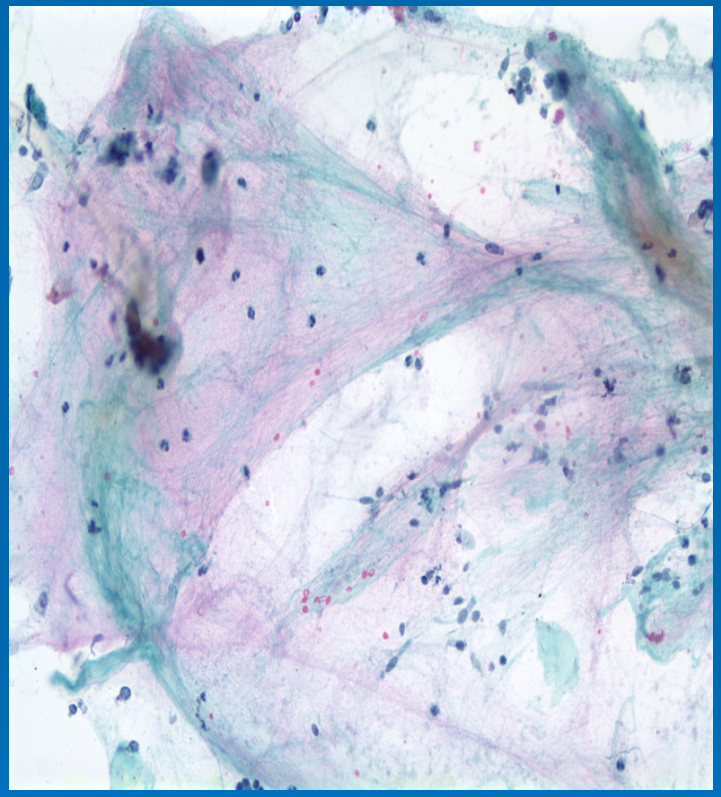
BACKGROUND



Coagulative necrosis: malignant

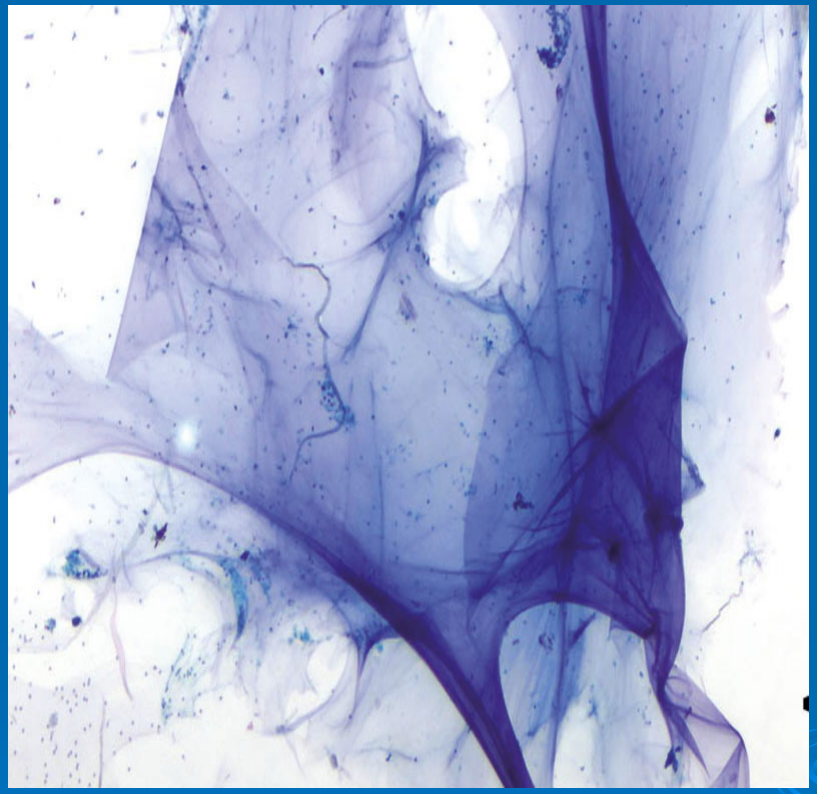


BACKGROUND: Mucus/Mucin



GI luminal mucus

- watery, thin, dirty, heterog
- bare nuclei, food



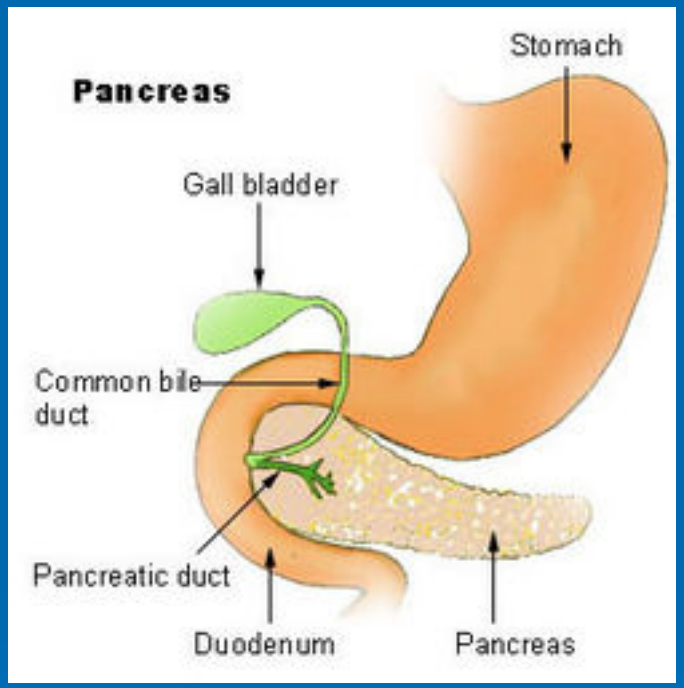
Mucin

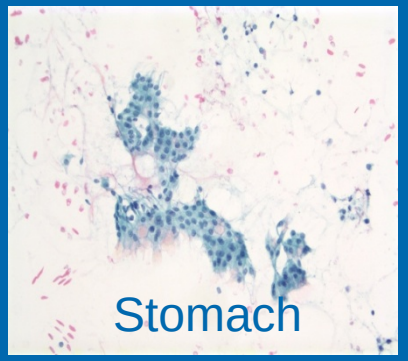
- thick, uniform
- cracked, colloid-like

BOTH + mucin stains

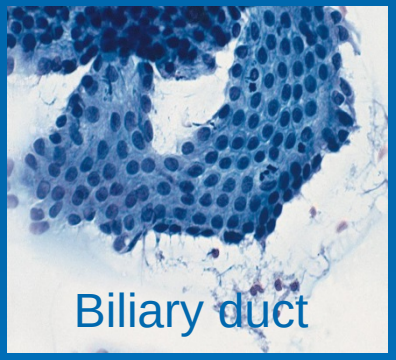
CONTAMINATION

Esophagus

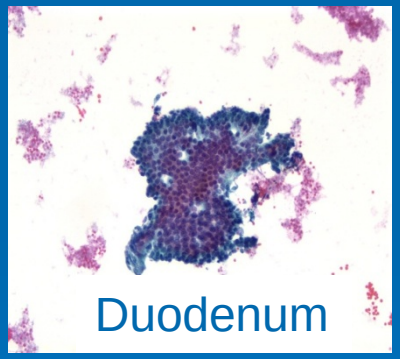




Stomach

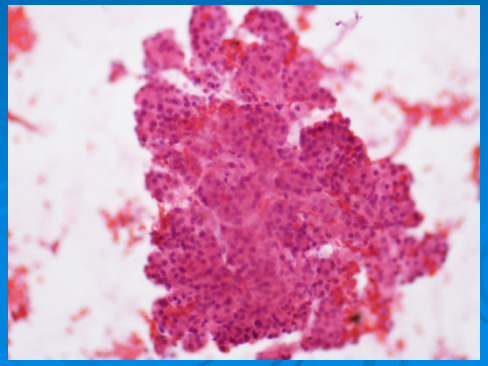


Biliary duct



Duodenum

Pancreas



Patterns

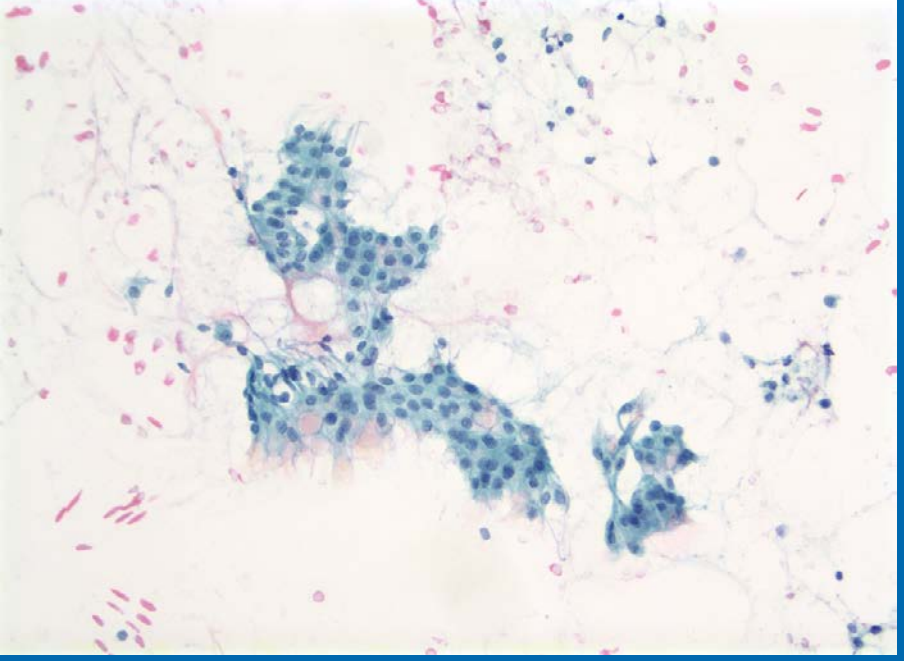
Single cells

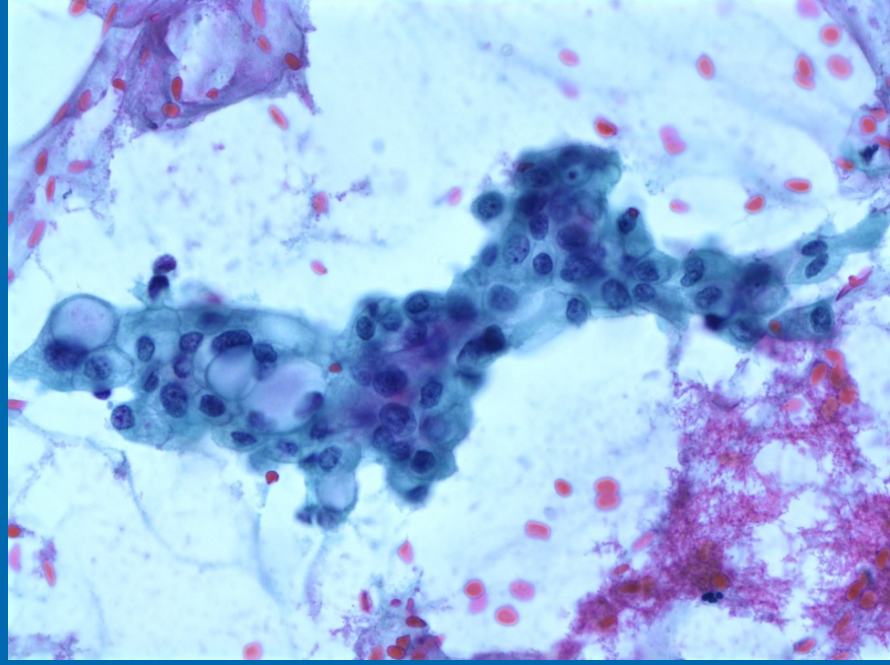
Glandular

Acinar

DIAGNOSIS: LO POWER Glandular Pattern

Mucosal Contamination	Adenocarcinoma
➢ Low to high cellularity	➢ High
➢ Cohesive, 2-D, flat	➢ Loosely cohesive, 3D
➢ Polarized groups	➢ Drunken honeycomb
➢ Naked grooved nuclei	➢ Single abN cells
➢ In mucus blobs	➢ Necrosis (coagulative)



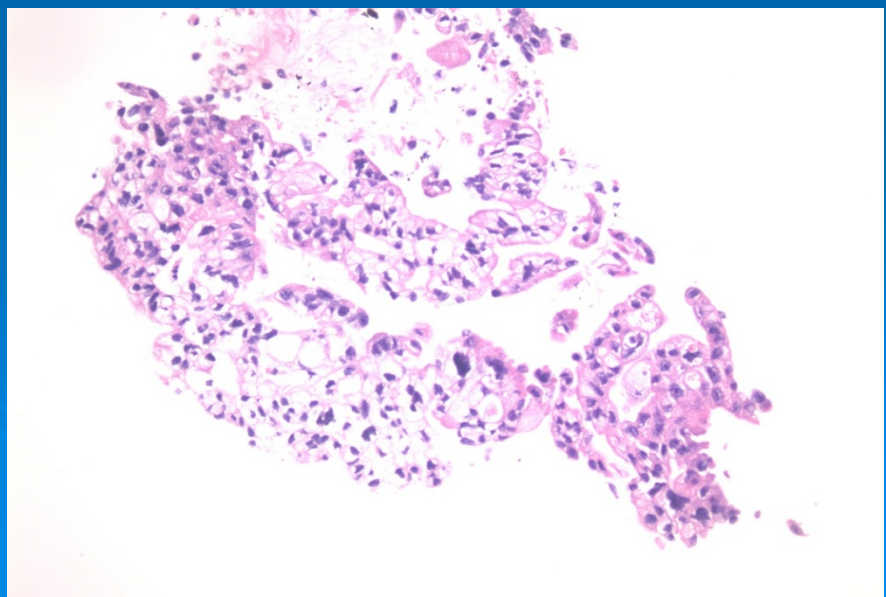


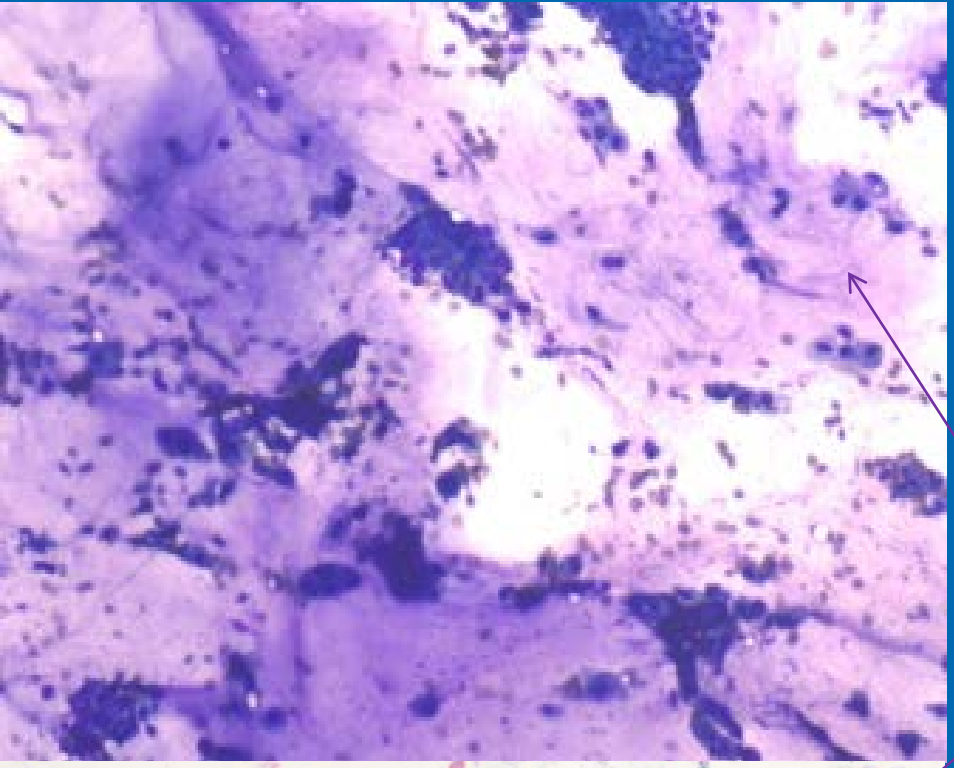
Mucosal contamination

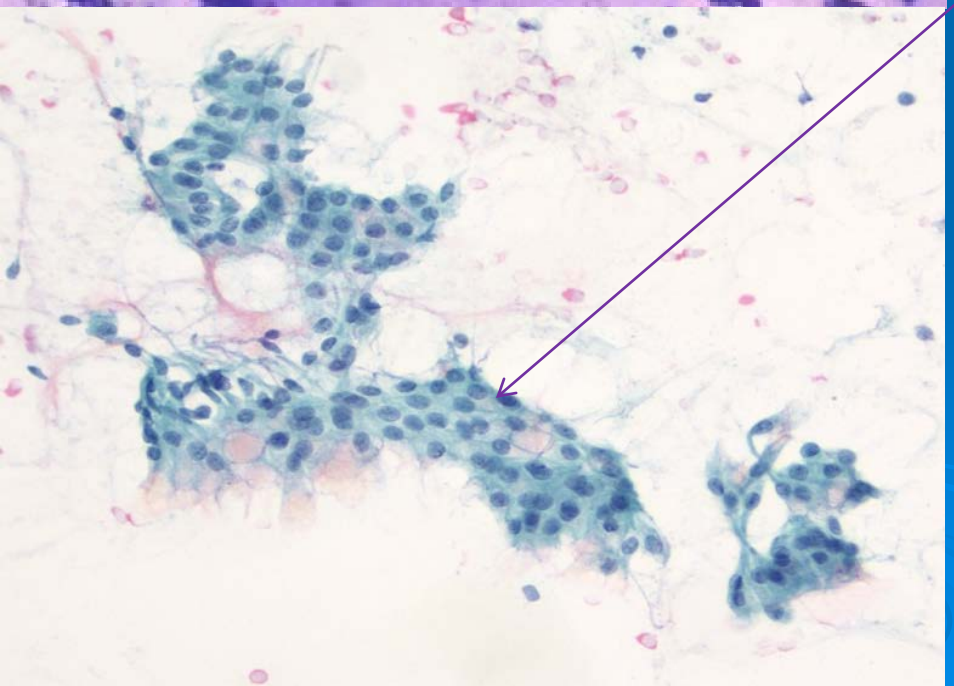
Polarized, cohesive

Ductal adenocarcinoma

Drunken honeycomb, atypia







CASE 1

GI mucus
Gastric mucosal contam'n

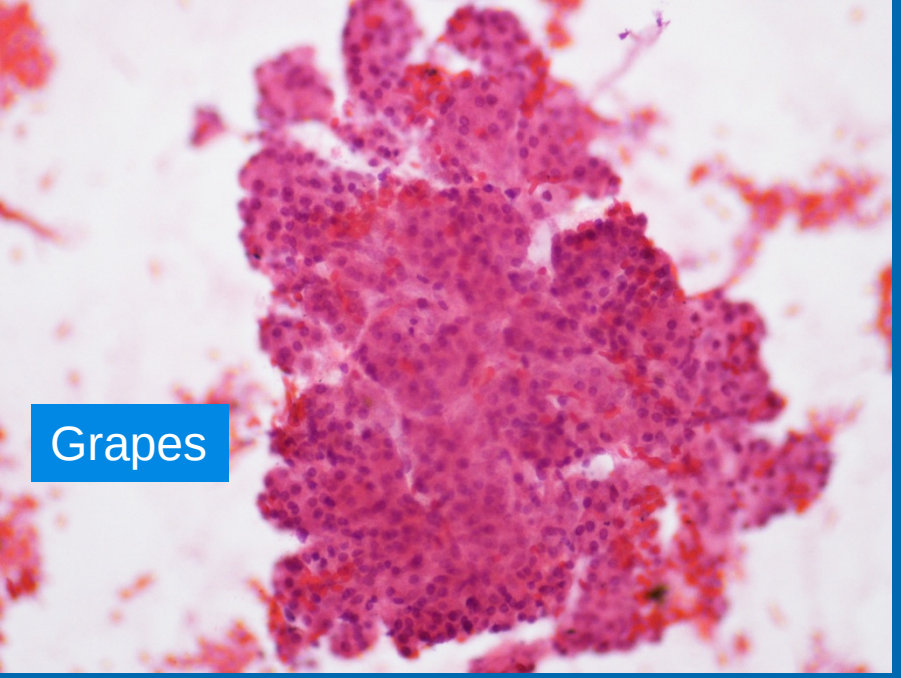
What about the acinar pattern?

DIAGNOSIS: LO POWER
Acinar Pattern

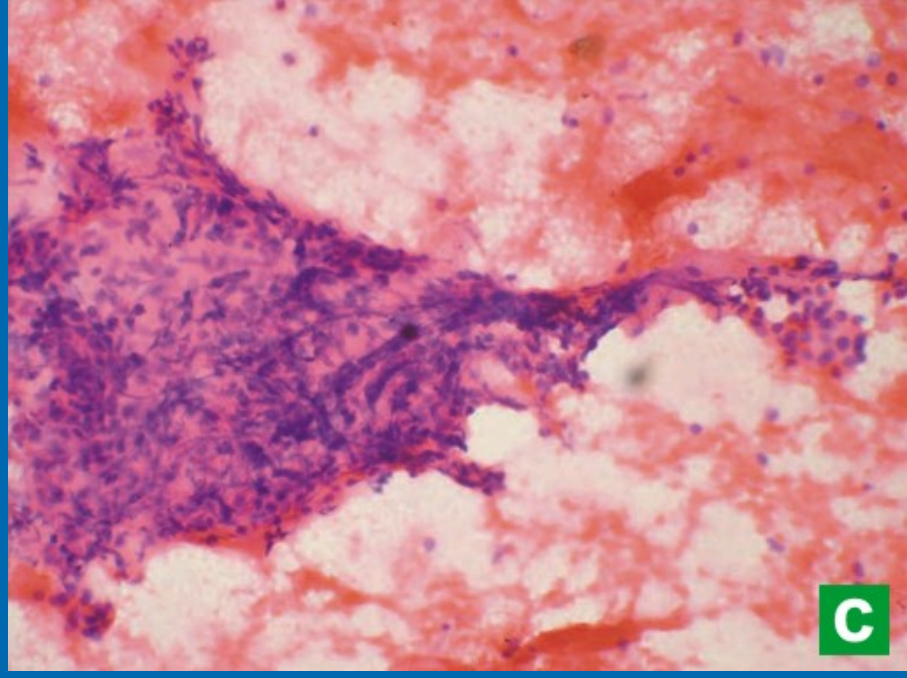
Contamination (pancreas/pancreatitis)	Neoplasm
➢ Lo – mod cellularity ➢ Cohesive, polarized ➢ Grape-like clusters ➢ Acini, ductal, islets	➢ Variable cellularity ➢ Dyshesion ➢ Single cells ➢ Uniform cell type

DIAGNOSIS: HI POWER
Acinar Pattern

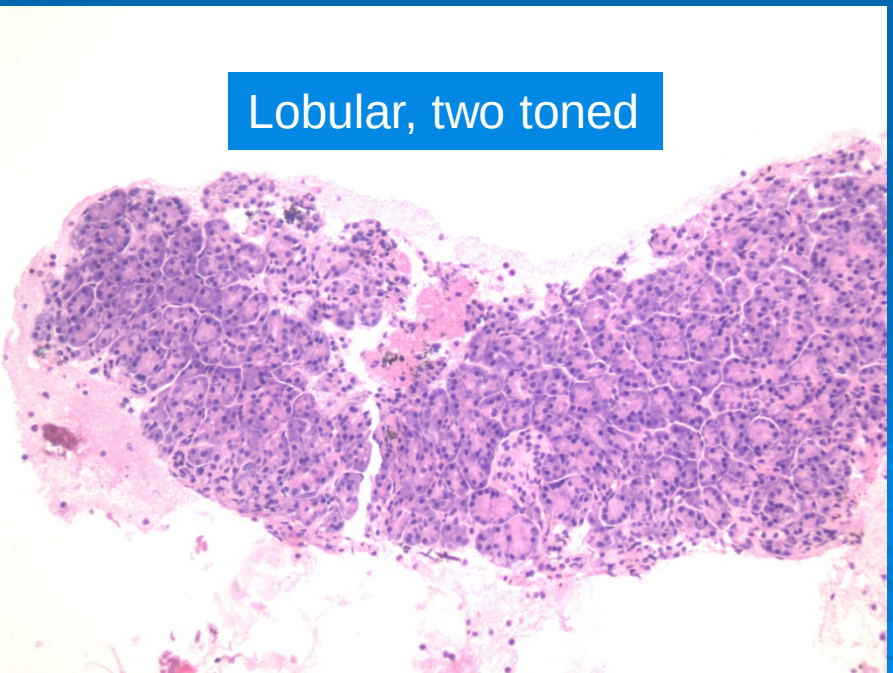
Contamination (pancreas/pancreatitis)	Neoplasm
➢ Lobular ➢ CB: 2-toned cytoplasm ➢ Granular cytoplasm ➢ Lymphoid tangles ➢ CB: fibrosis, loss of acini	➢ Vascular (PEN, SPN) ➢ Nuclear clues - salt/pepper (PEN) - grooves (SPN) - ++ nucleoli (ACC)

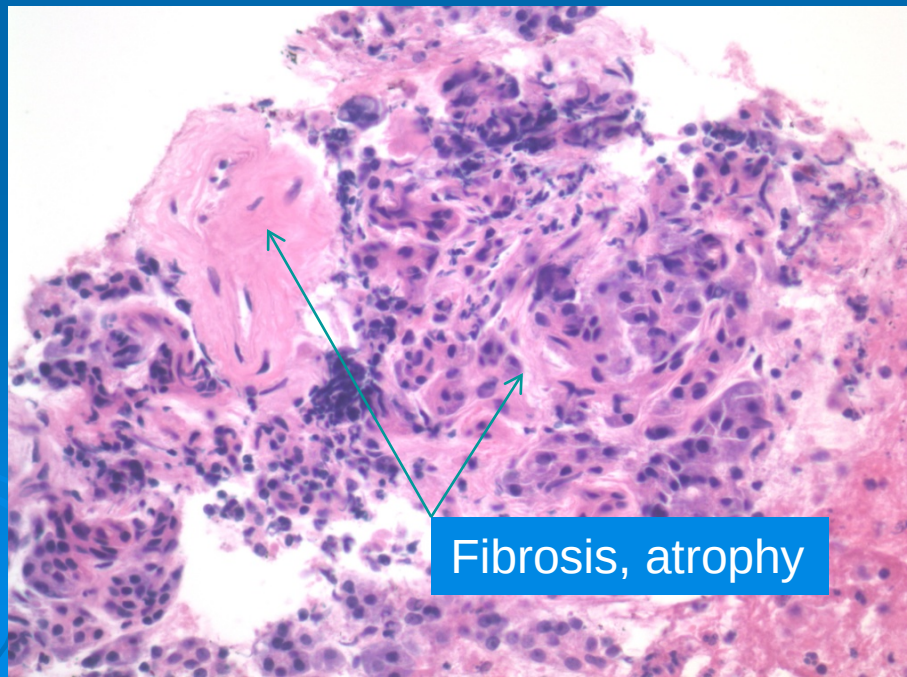


Normal pancreas

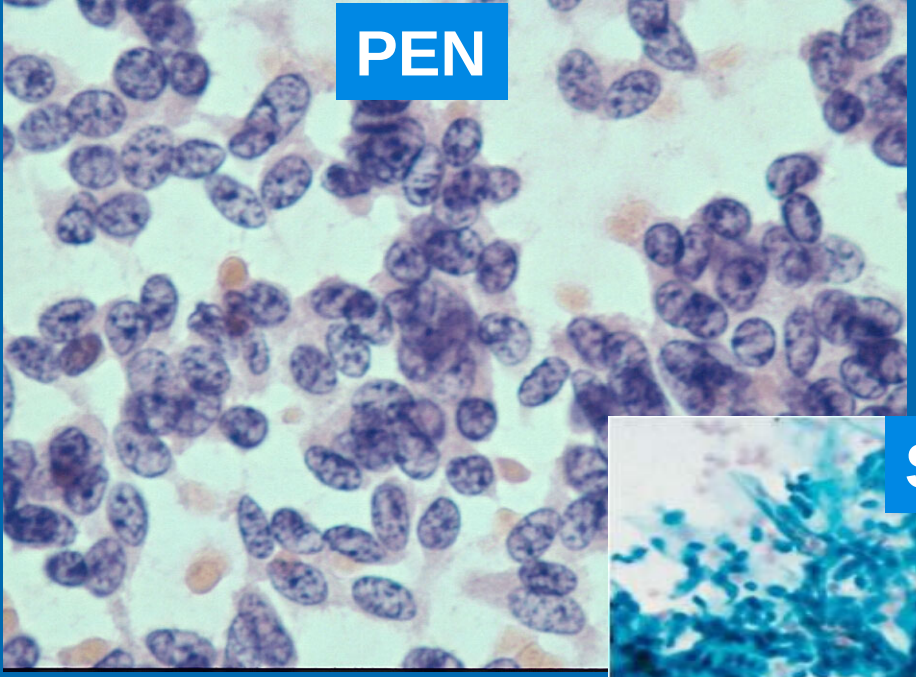


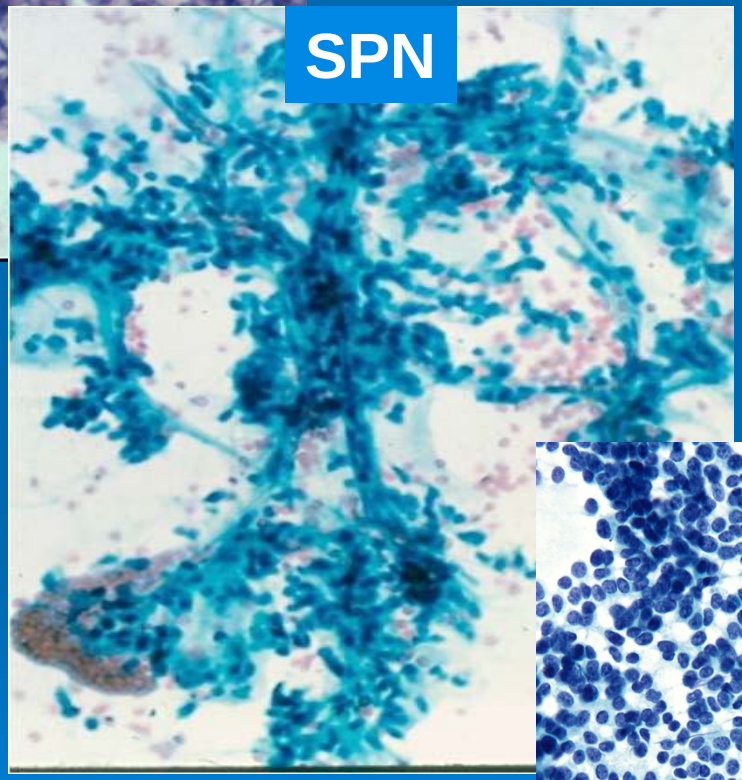
Chronic pancreatitis

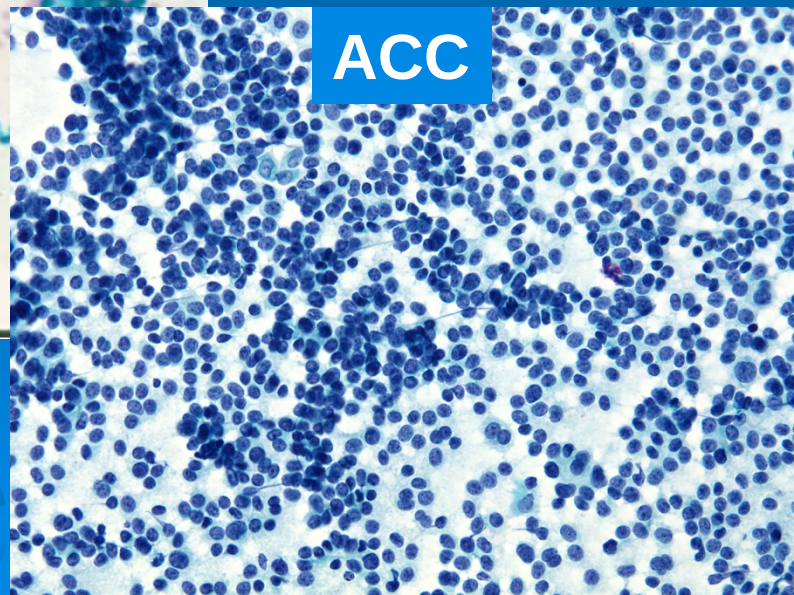


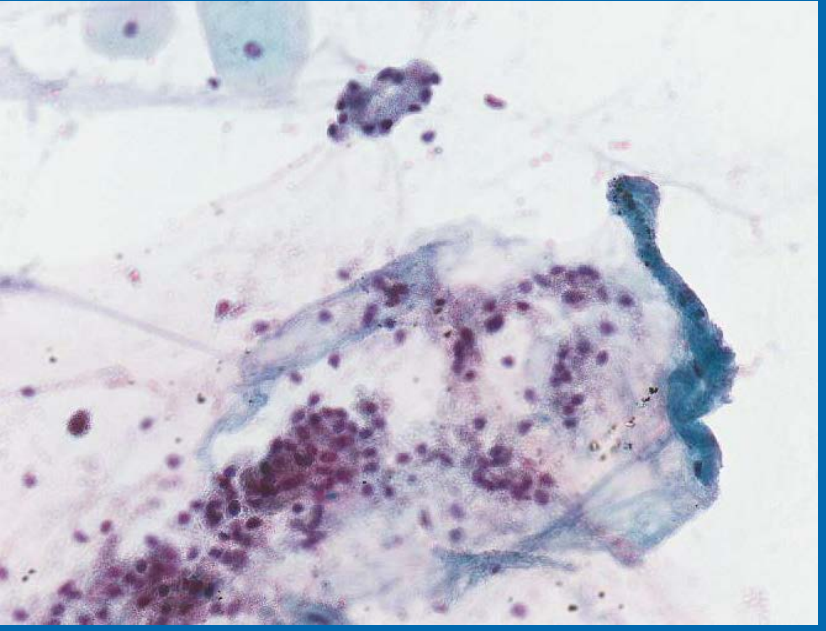


Acinar Pattern



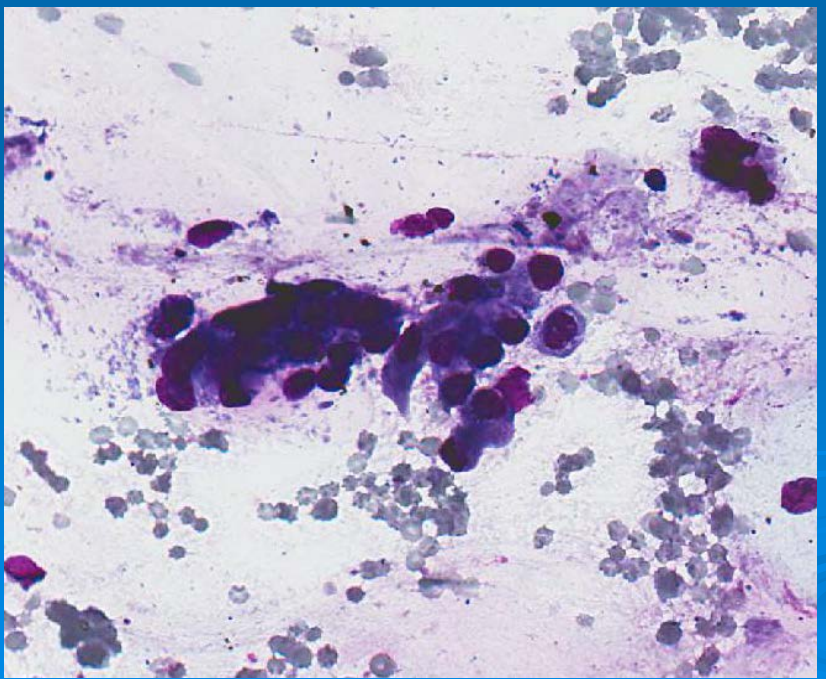


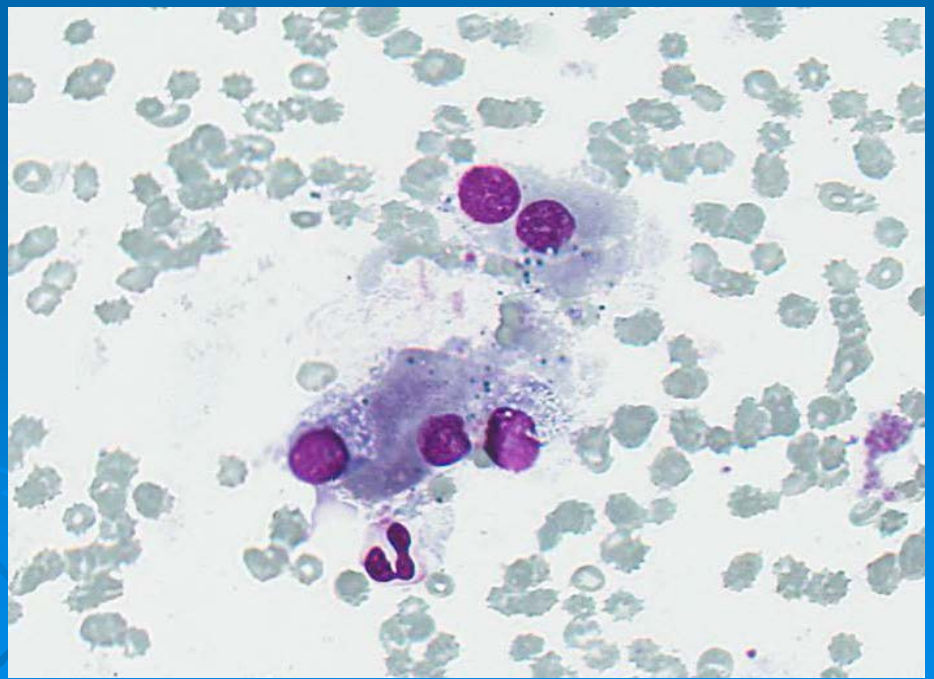


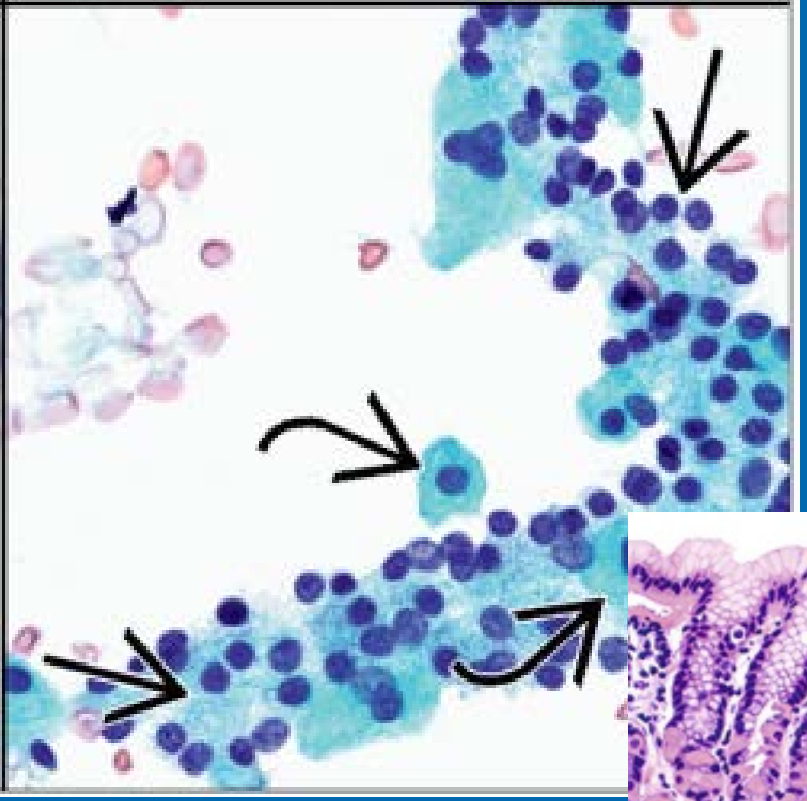


Acinar pattern
Single cells

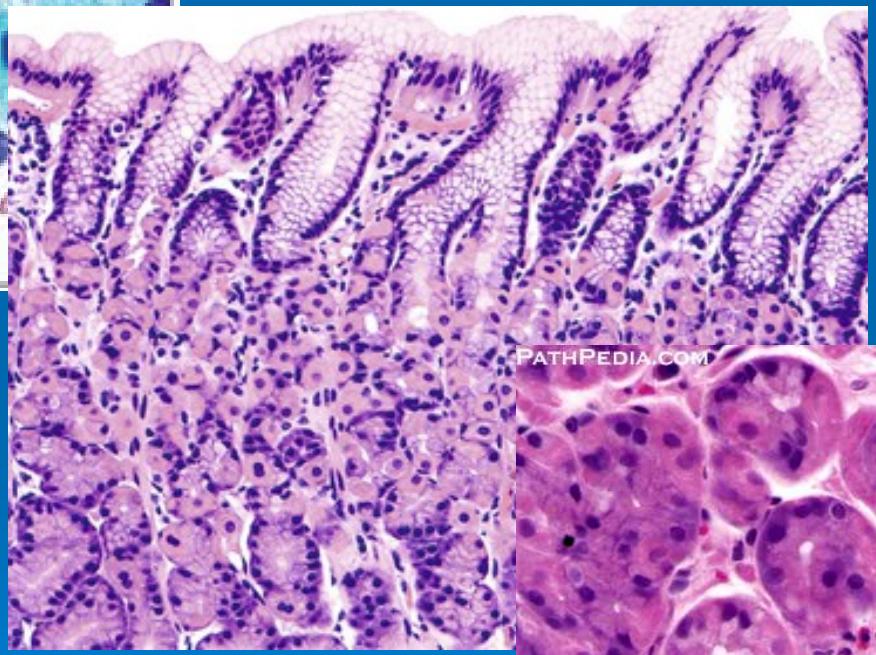
Large polygonal
Smaller finely granular

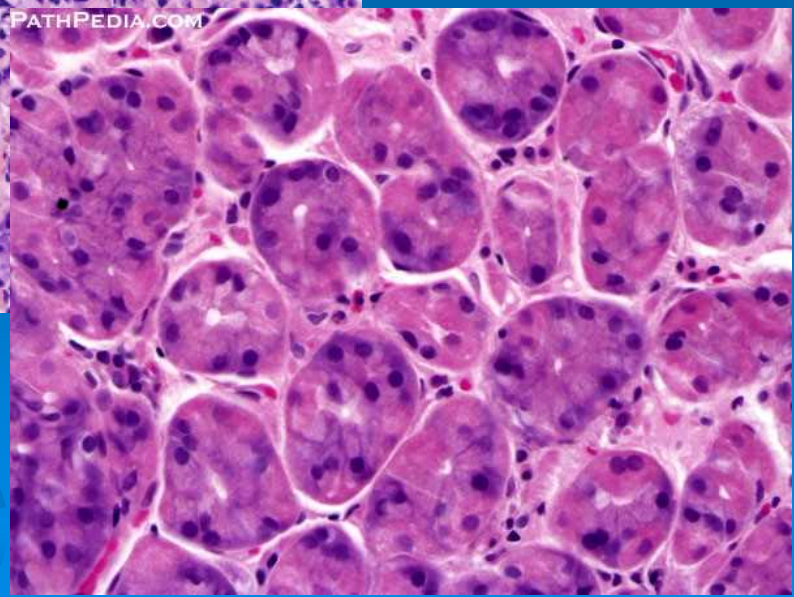




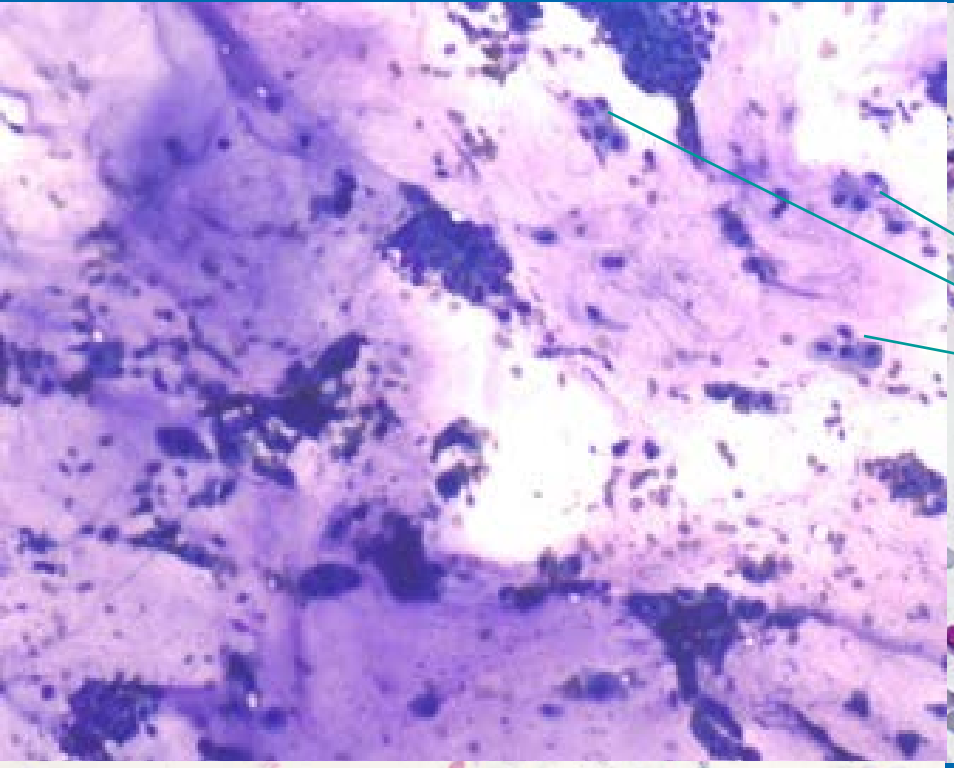


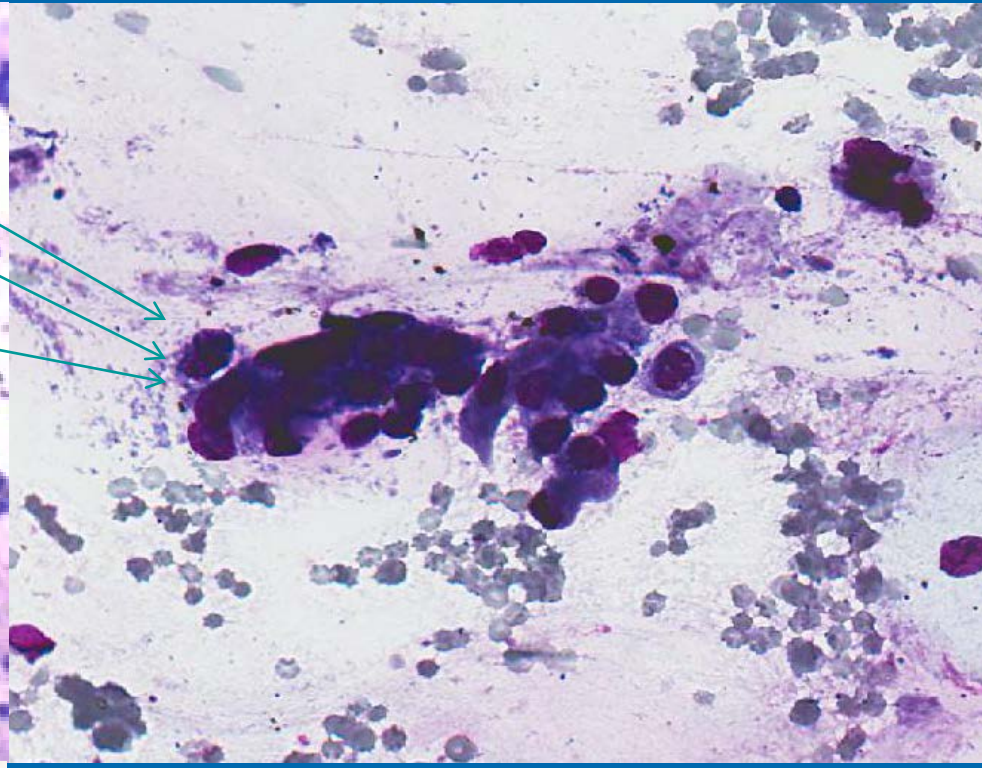
Acinar pattern

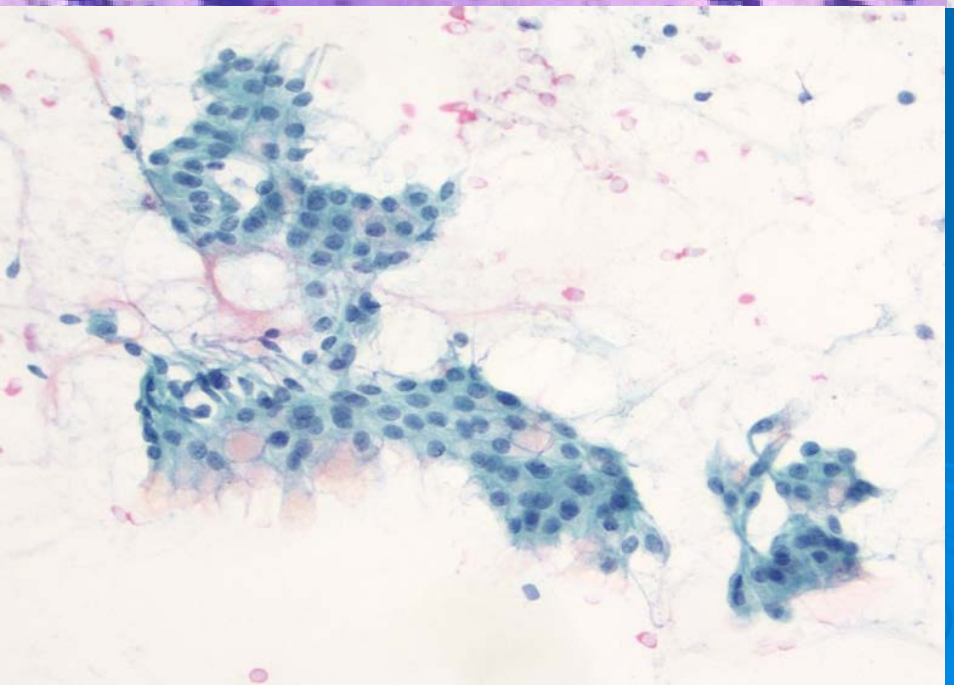




Chief cells (purple)
Parietal cells (pink)







CASE 1

Non-lesional
Normal gastric oxyntic (body type) glands

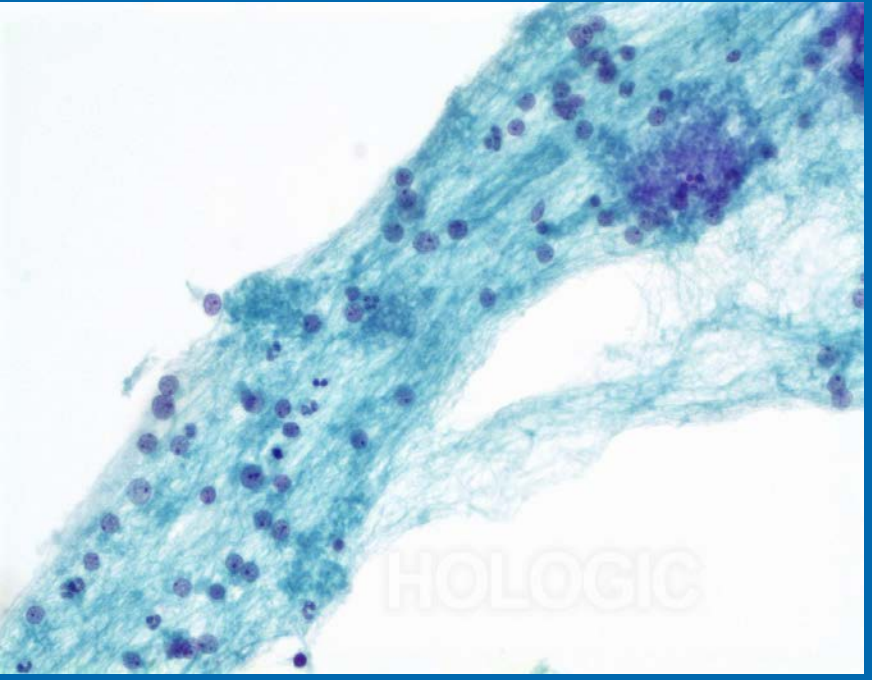
Remember to exclude contaminant first

Case 2

- 60 year old male
- Distal pancreatectomy for PEN

- TOP region mass
- Transgastric EUS FNAB

- ??recurrent PEN



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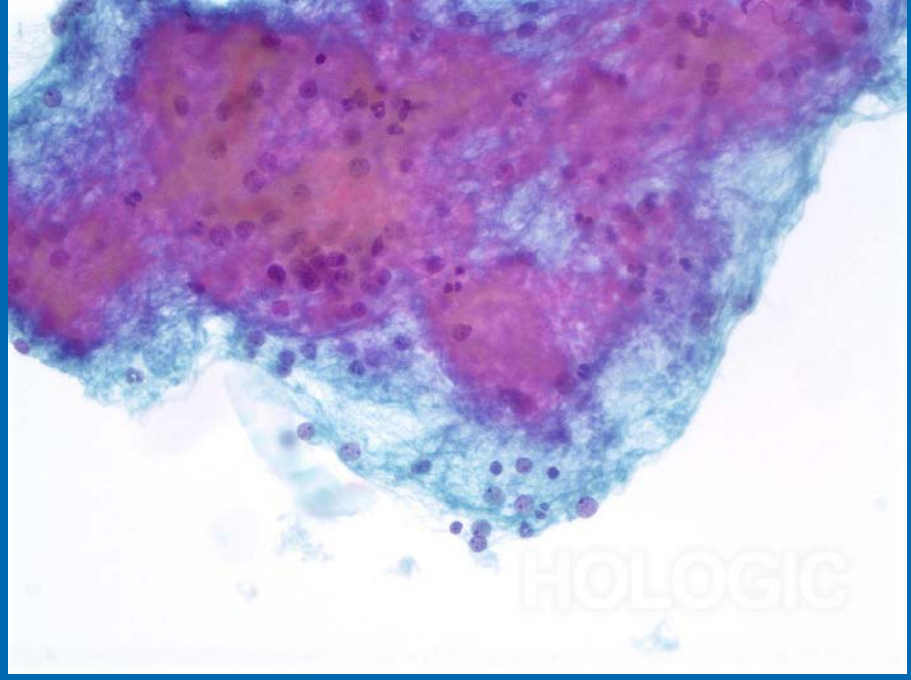
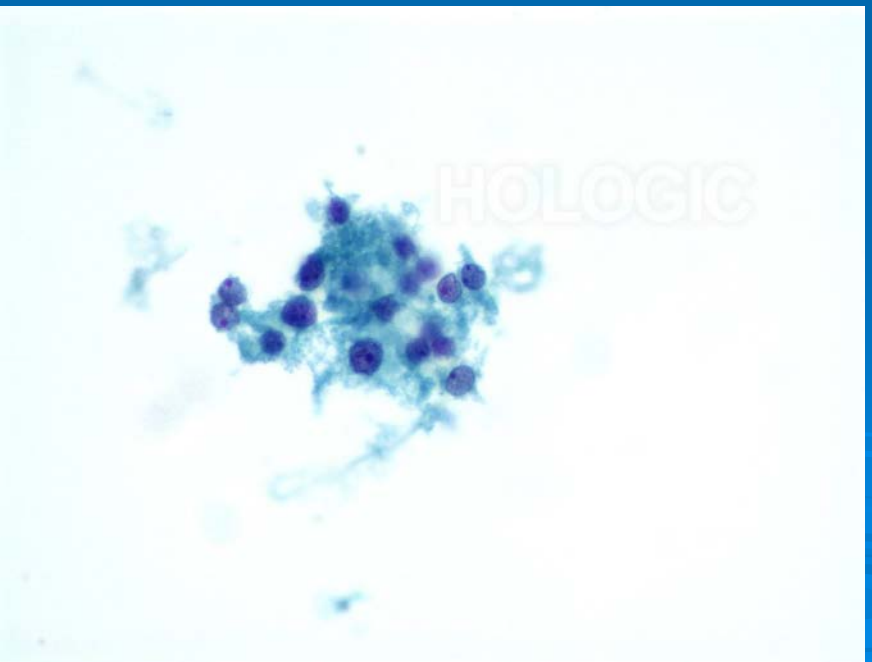
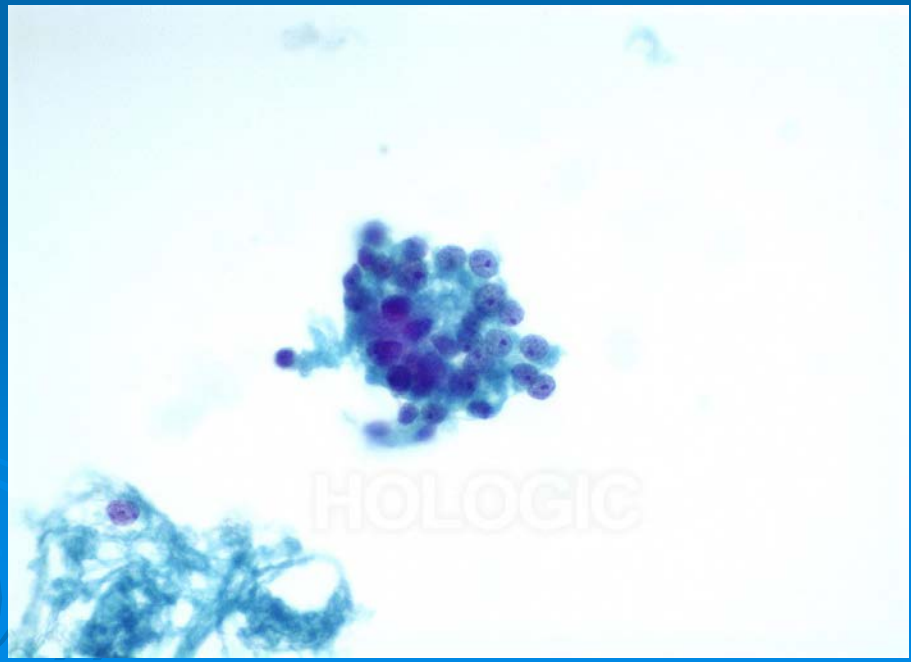


What is your diagnosis?





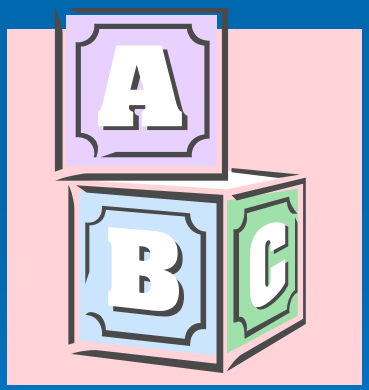
What is your diagnosis?

a) Gastric contamination
b) Pancreatic endocrine neoplasm
c) Renal cell carcinoma
d) Solitary pseudopapillary neoplasm
e) Something else?

Approach

- Clinical & imaging important
  - if solid – use algorithm for DDX

- Microscopic approach
  - Adequacy
    - Background
      - Contamination
        - Diagnosis



ALGORITHM: Acinar pattern

Non-neoplastic

- Normal contaminant
  - pancreas
  - gastric oxyntic cells
- Pancreatitis

Neoplastic

- Pancreatic endocrine neoplasm
- Acinar cell carcinoma
- Solid pseudopapillary neoplasm
- Pancreaticoblastoma
- Metastasis

Other patterns: single cells, glandular, cystic

ADEQUACY: ROSE

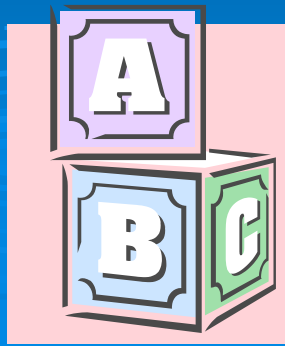
- Purpose: triage for ancillary studies

  NEED cell block!

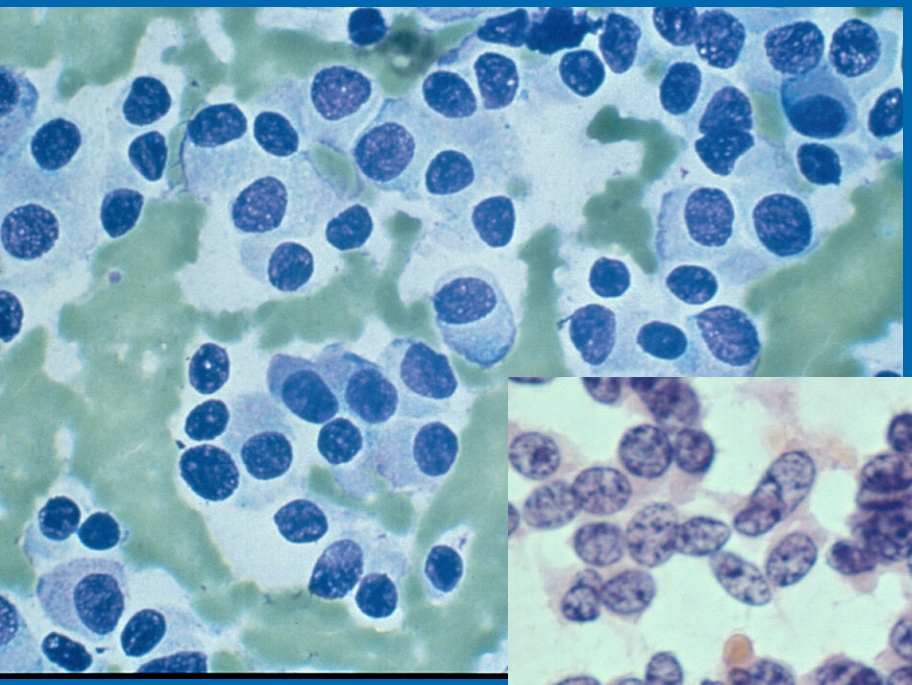
  Do cores

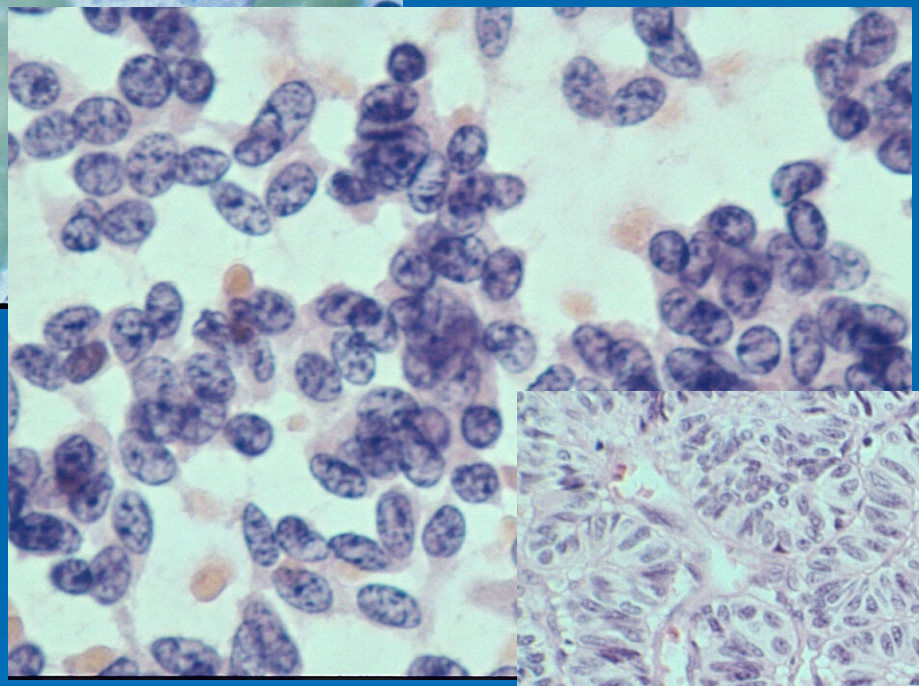
- EUS toys

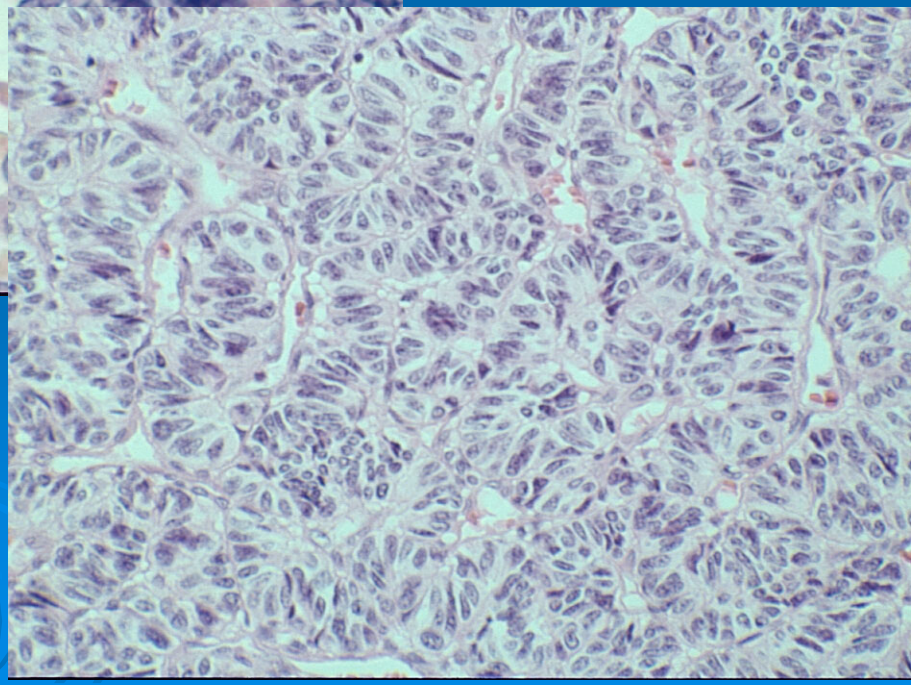
  - Shark cores
    - decrease # smears
    - better sampling fibrosis
    - id invasion: stromal, perineural
    - material for immunomarkers



PEN

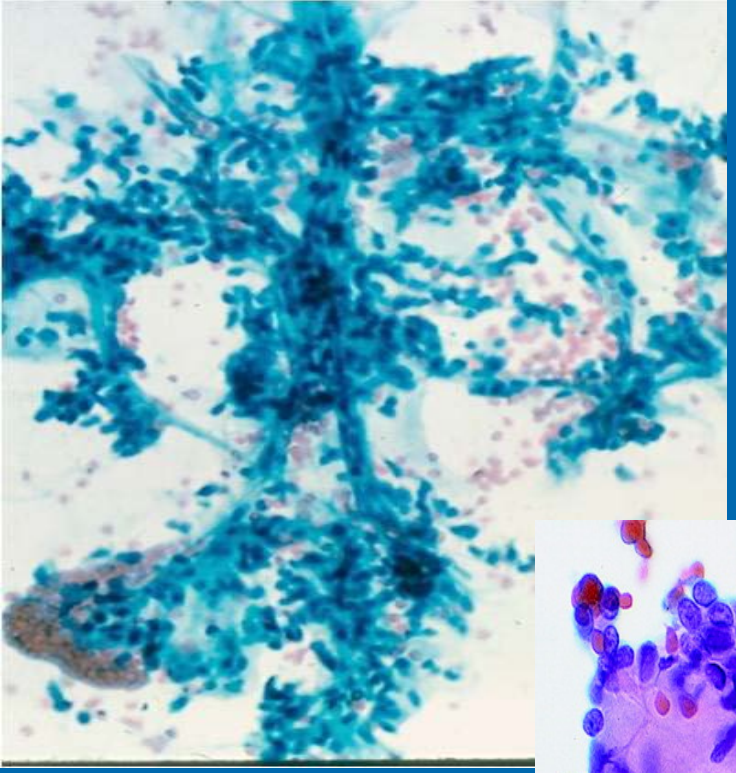


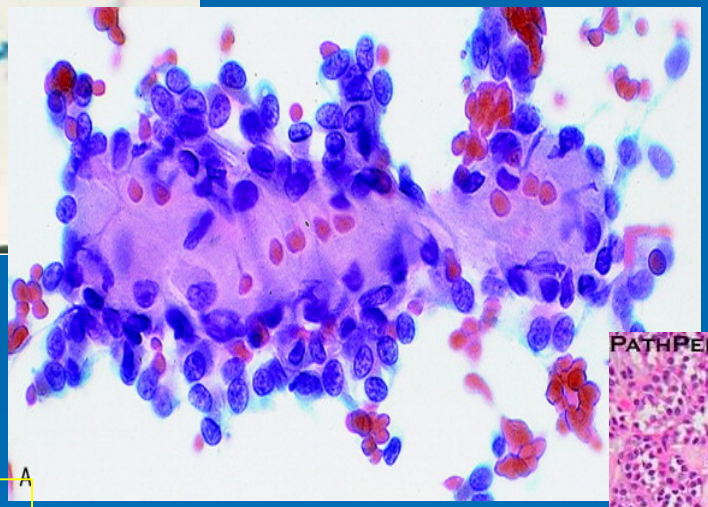


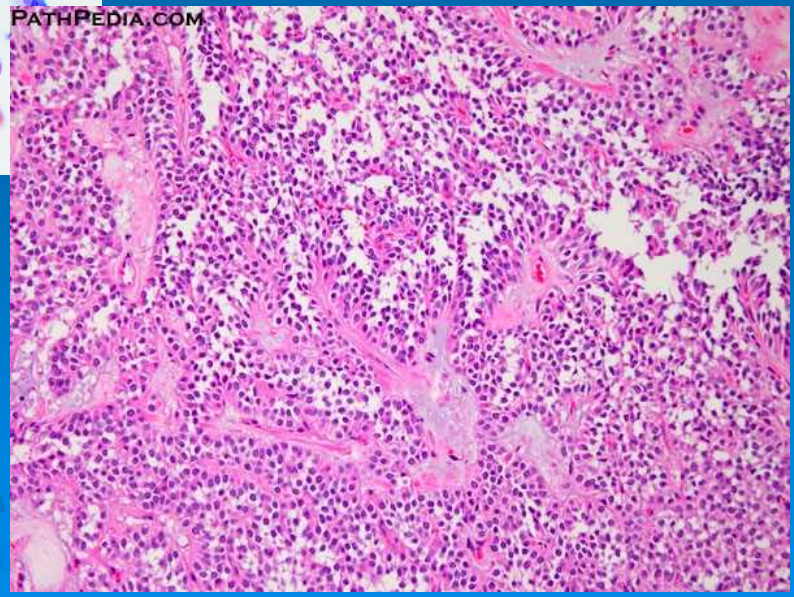


Dyshesive, homogeneous
Salt & pepper
Cell block: insular/acinar pattern
Chromogranin, synaptophysin +

SPN

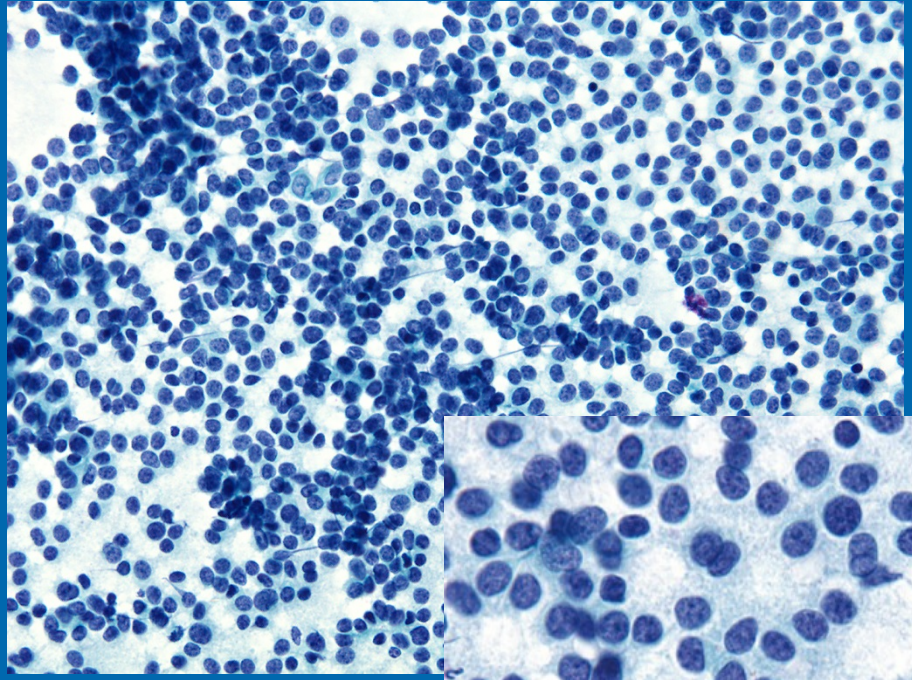


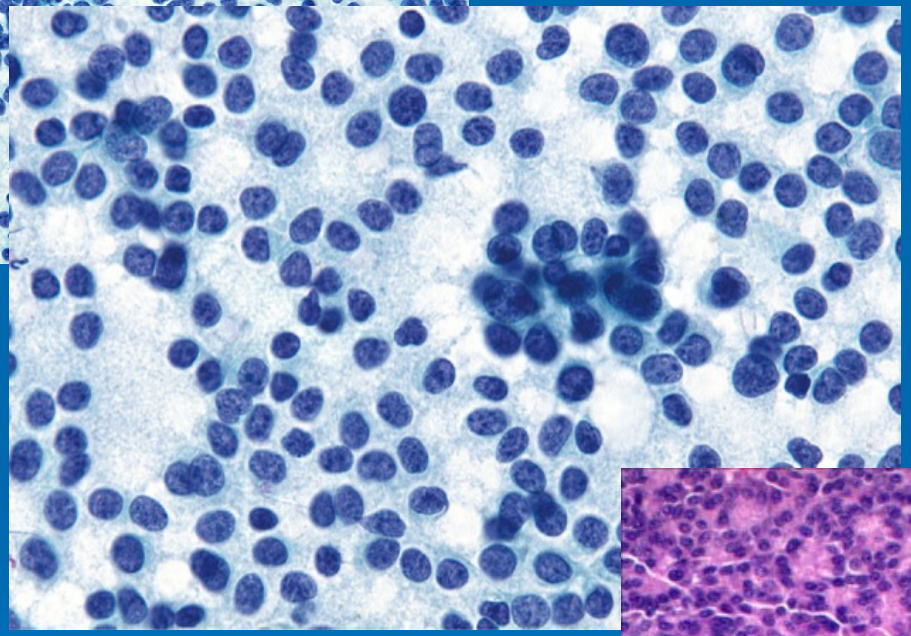


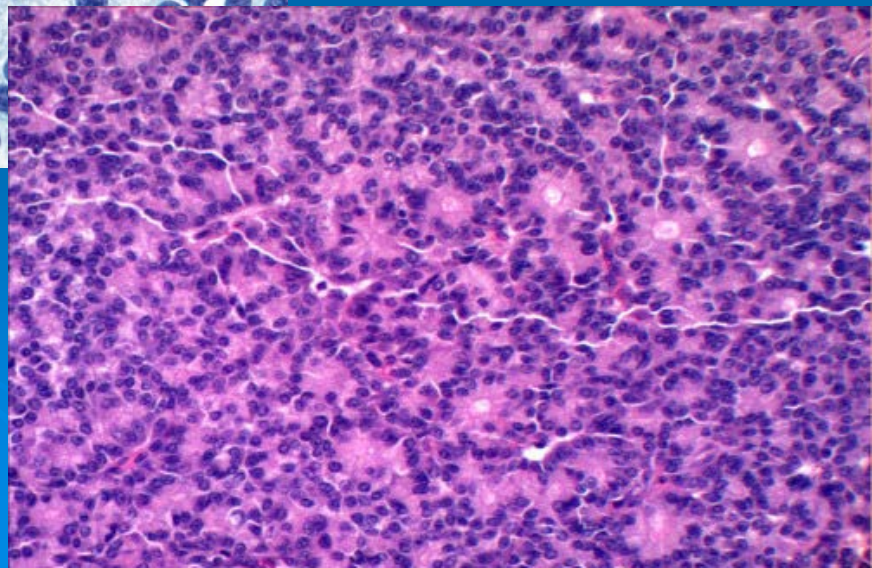


Vascular
Heterogeneic
Pseudopapillary
Grooved nuclei
B-catenin, CD10 +
Chromo -, synapto +

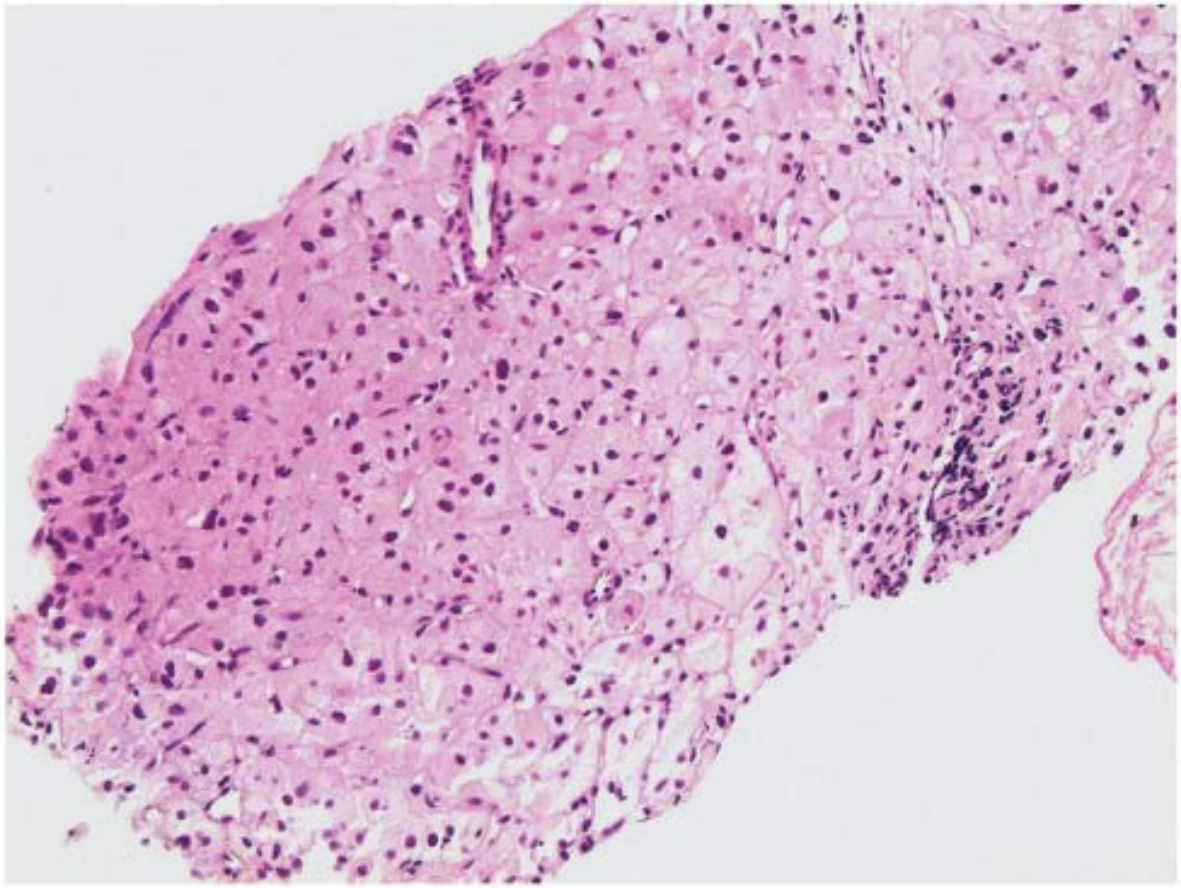
ACC







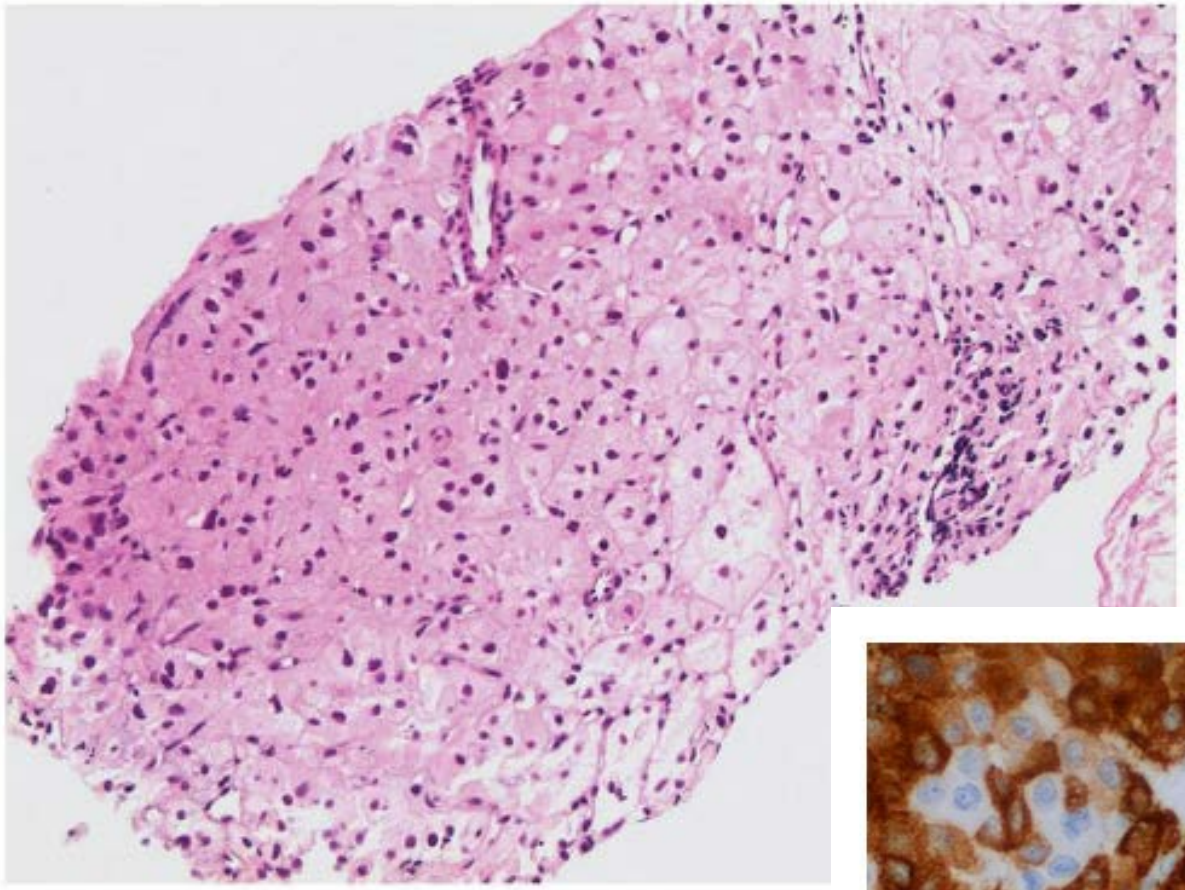
Dyshesive
Loose acini
Nucleoli
Chymotrypsin, trypsin +



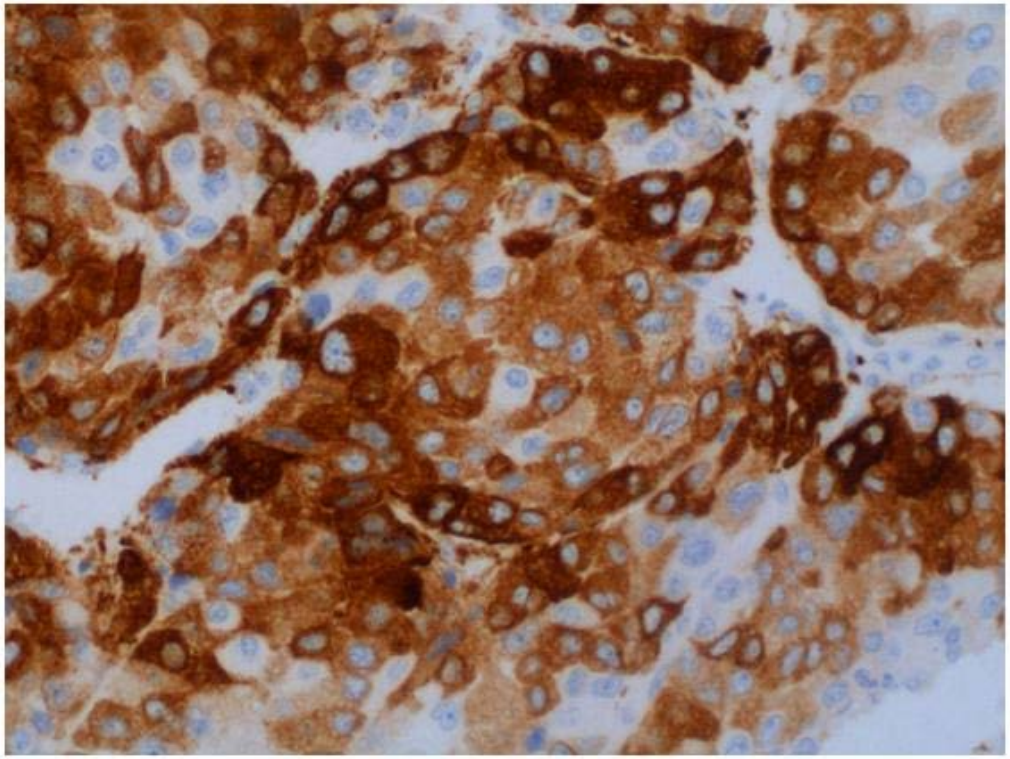
Cell block

Foamy vacuolated cytoplasm
Bland nuclei

Lacks salt/pepper
No grooves
Not vascular



Cell block



Inhibin +
Melan-A +

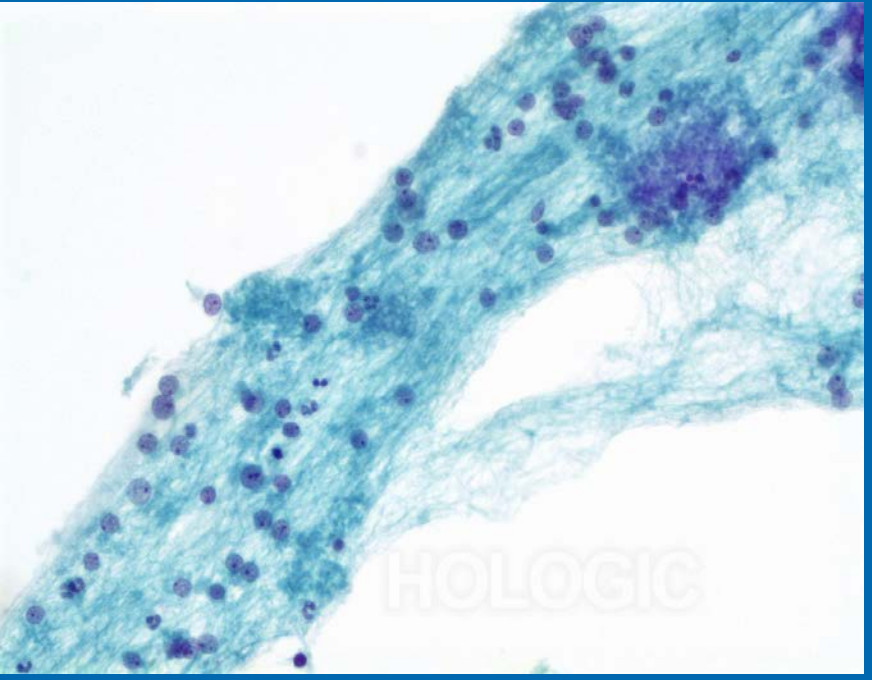
ADRENAL CORTICAL CELLS

Outer layer

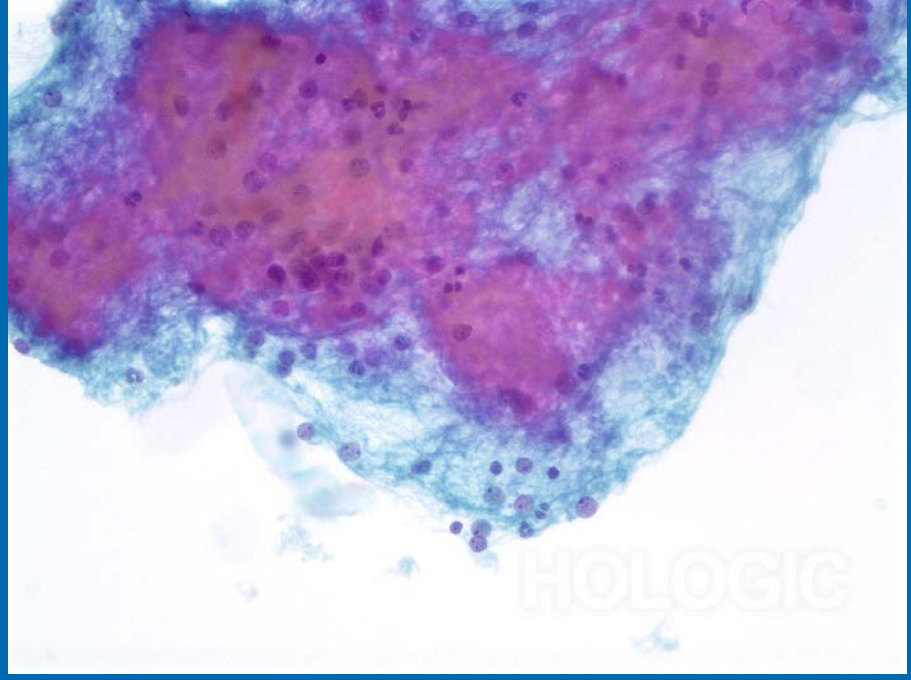
- foamy lipid rich background
- single cells, clusters
- bland oval nuclei
- no or small nucleoli
- abundant vacuolated cytoplasm with frayed edges

Inner Layer

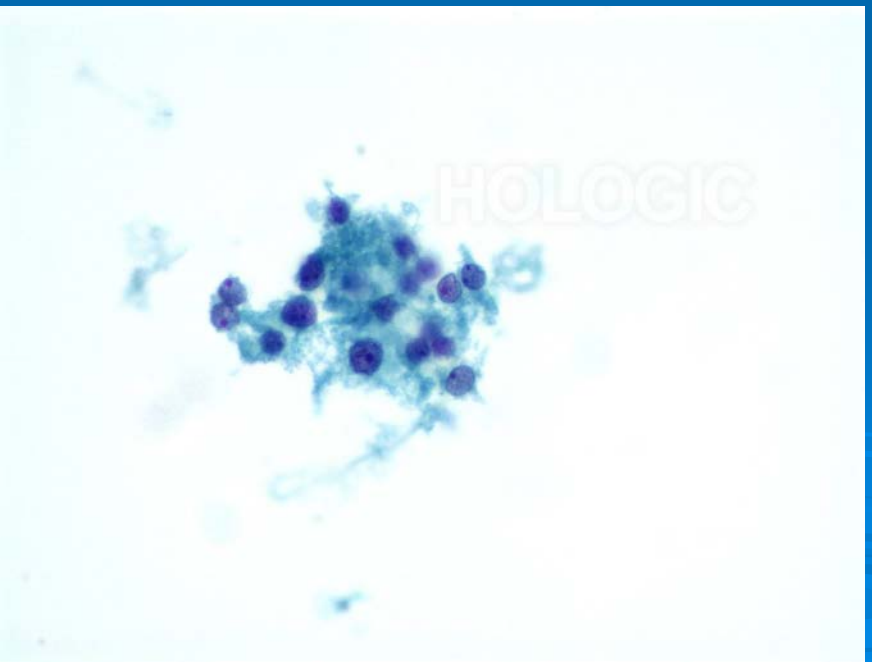
- smaller cells
- lipofuscin pigment
- granular eosinophilic cytoplasm
- no vacuolization

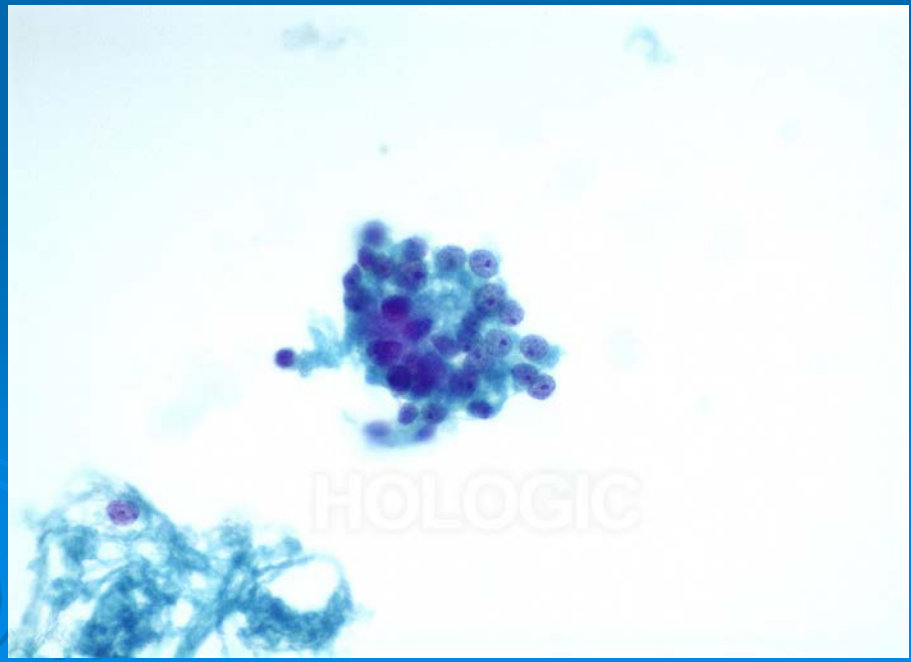


What is the pattern?



What is your diagnosis?





CASE 2

- How would you report this?

CASE 2

- How would you report this?

- Indeterminate
- Adrenal cortical sampling

- May represent normal cortex or neoplasm (benign/mal)
- Distinction not possible based on fnab alone

ALGORITHM: Acinar pattern

Non-neoplastic

- Normal contaminant
  - pancreas
  - gastric oxyntic cells
  - adrenal
- Pancreatitis

Neoplastic

- Pancreatic endocrine neoplasm
- Acinar cell carcinoma
- Solid pseudopapillary neoplasm
- Pancreaticoblastoma
- Metastasis
- Adrenal neoplasm

Optimization Cell Blocks

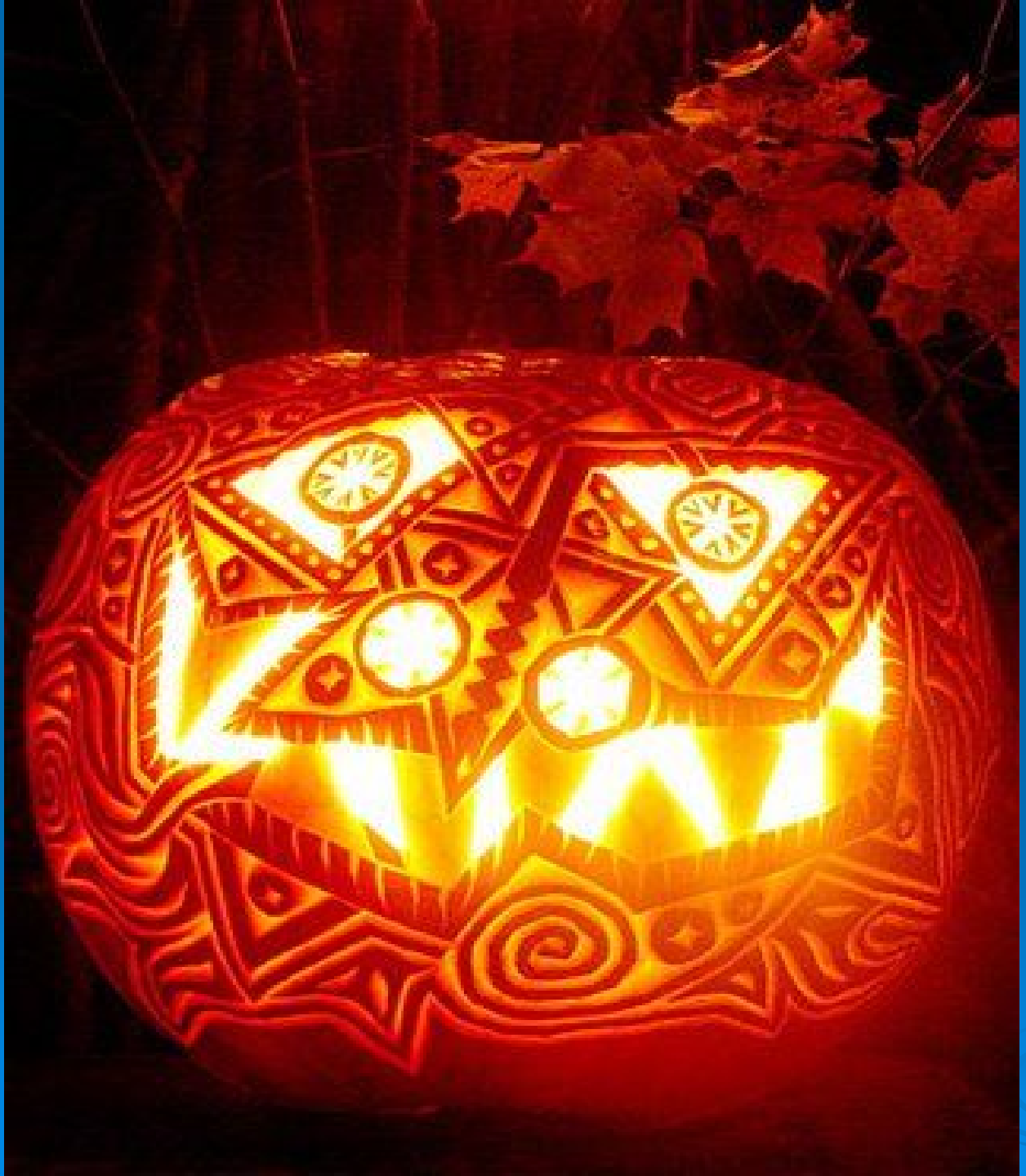
- ROSE triage

  - once dx made, then CB #1 priority

- Increase # CB & fixative types

  - formalin, Cytolyt, cores, pellets, Histogel

- Avoid refacing CB
- Cut H&E levels



Remember sampling of adjacent structures

Take home points

- Use solid, acinar algorithm for DDX
- Remember ABCDs

- Consider
  - normal contaminants
  - adjacent structure sampling

- Optimize cell block use

Questions?