Radiology / Pathology Conference

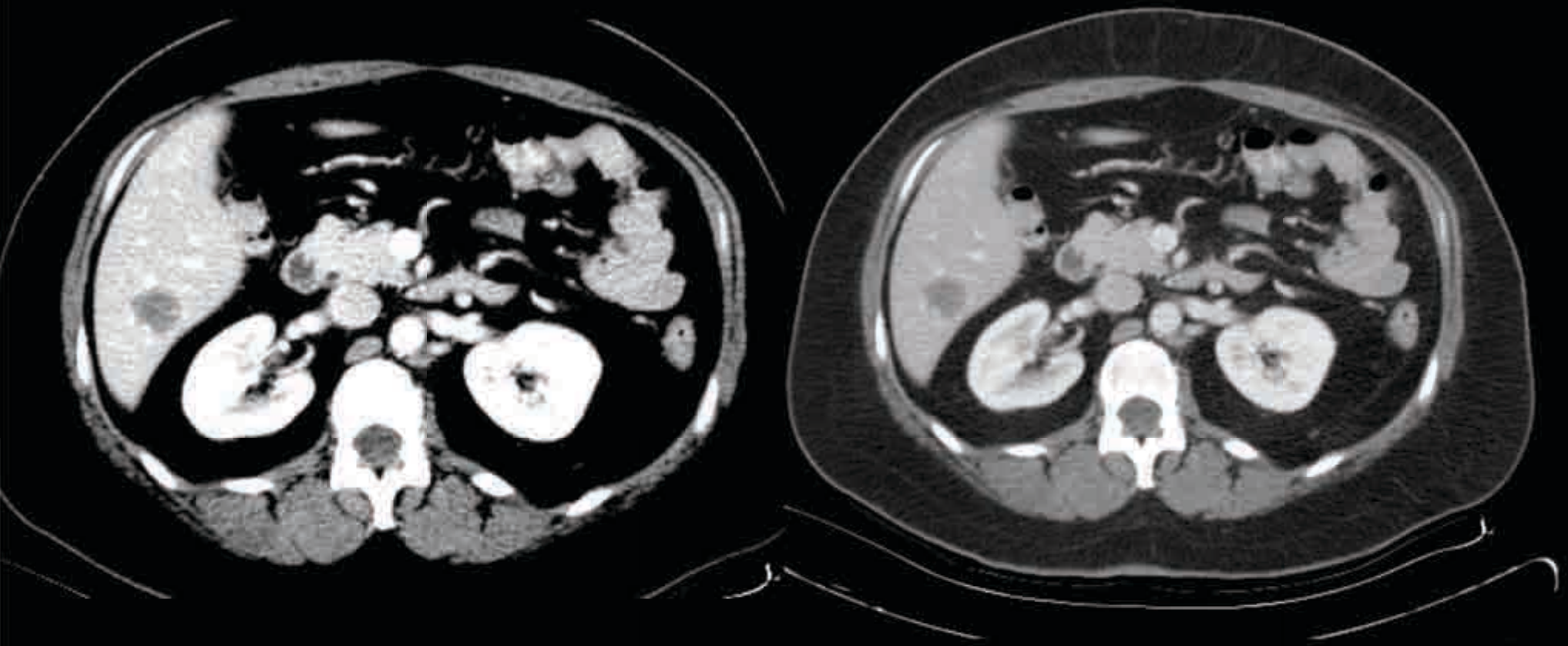
9/24/2010

Kirsten Woolf, Cytopathology Fellow

Trushar Sarang

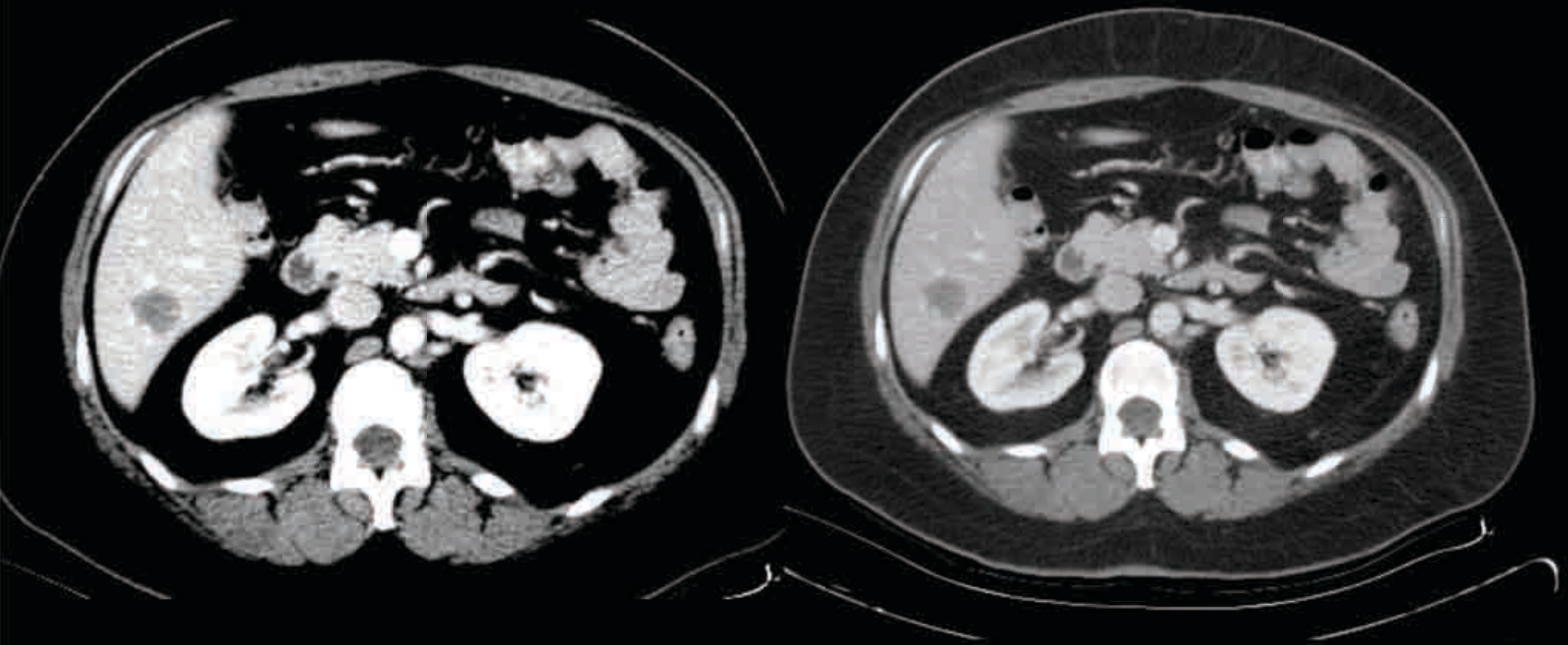
Case 1

50 year old female with abdominal pain. Finding #1



Case 1

50 year old female with abdominal pain. Finding #1



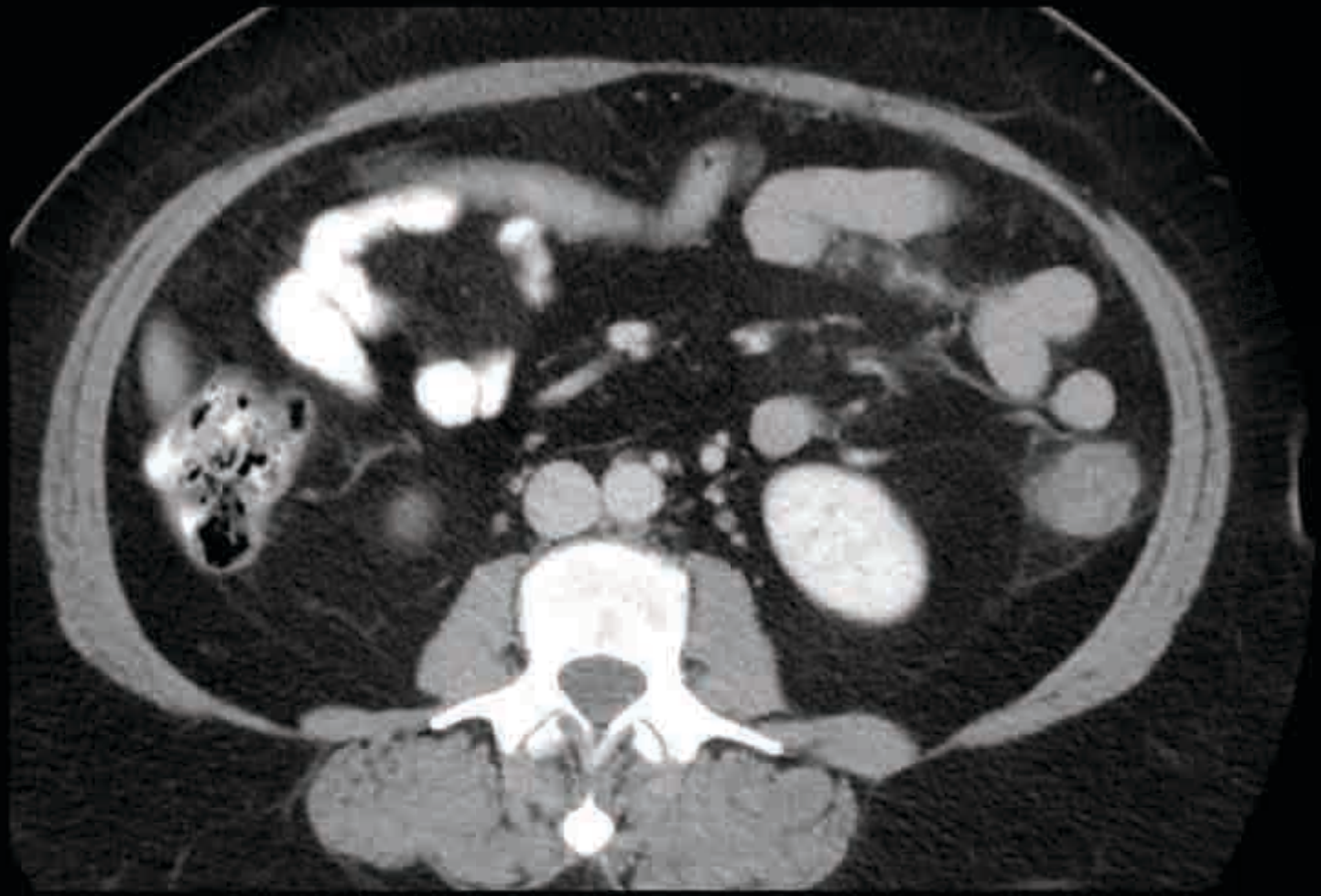
Differential?

Case 1

- Finding #1: Low attenuation liver lesions ddx
  - Well defined borders
    - Cyst
    - Hemangioma (peripheral nodular enhancement)
  - Ill-defined margins: Malignancy
    - Mets – hypovascular
      - adenoca (pancreas/colon)
    - Primary tumor
      - Cholangiocarcinoma

Case 1

- Finding #2:



Case 1

- Finding #3:

Case 1

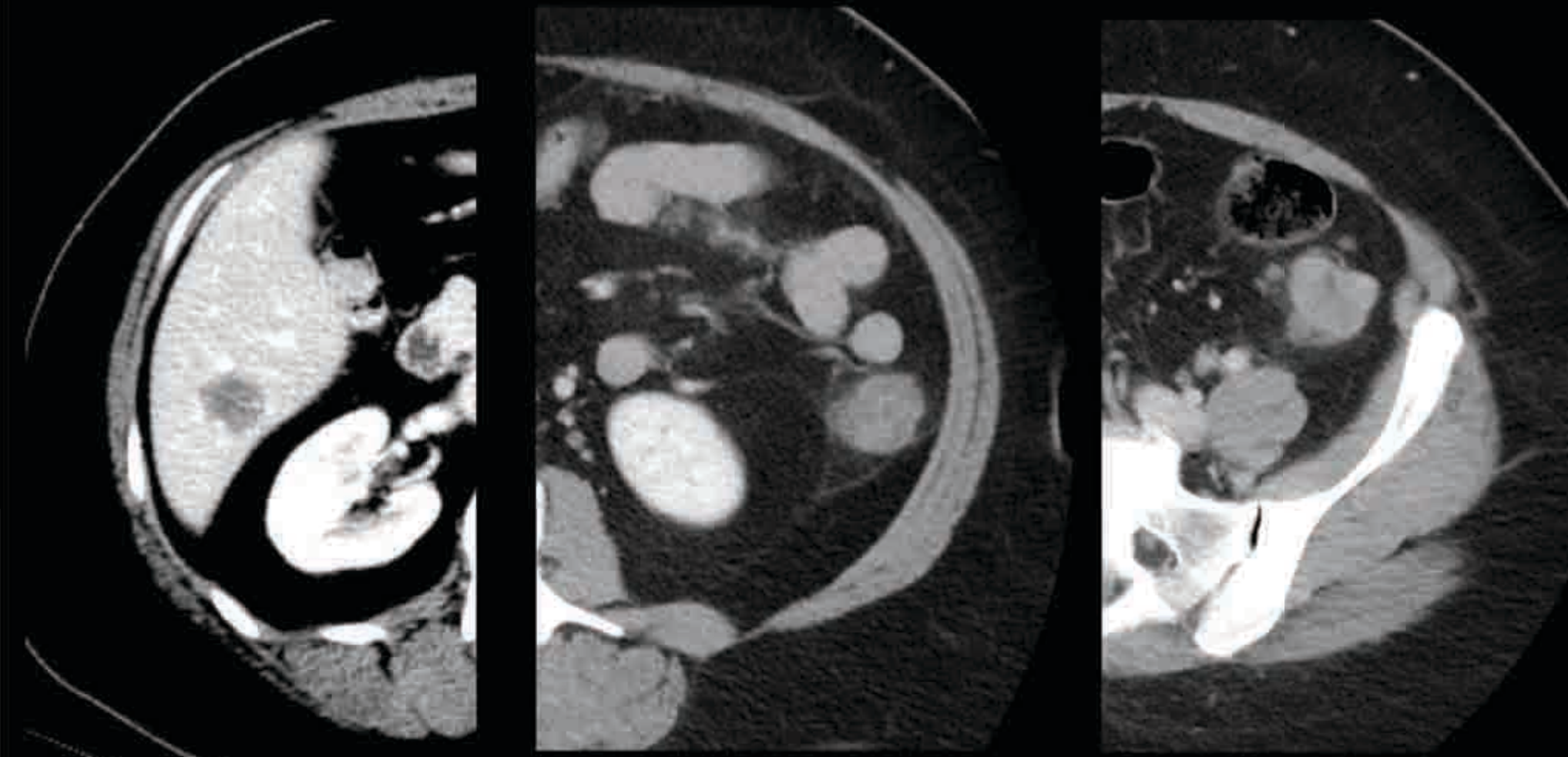
- Finding #3: Differential?

Case 1

- Finding #2 & 3: Thickened/irregular colon – 4 I's
  - Infection
  - Ischemia (watershed, mesenteric gas)
  - Inflammatory bowel disease
  - Infiltrative tumor
  - Penetrating injury – fish bone, hematoma, etc.

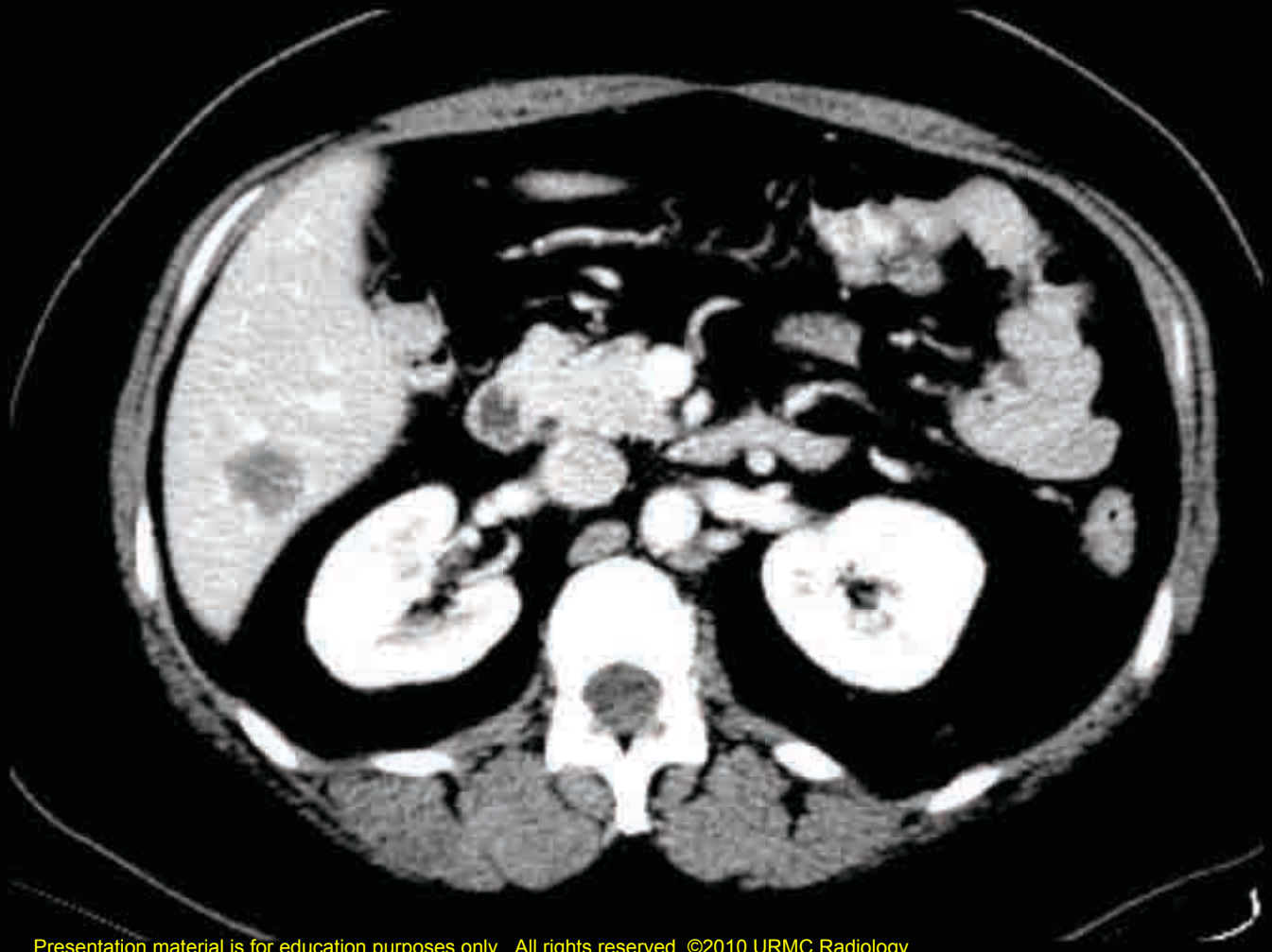
Case 1

- Which of these are you worried about?



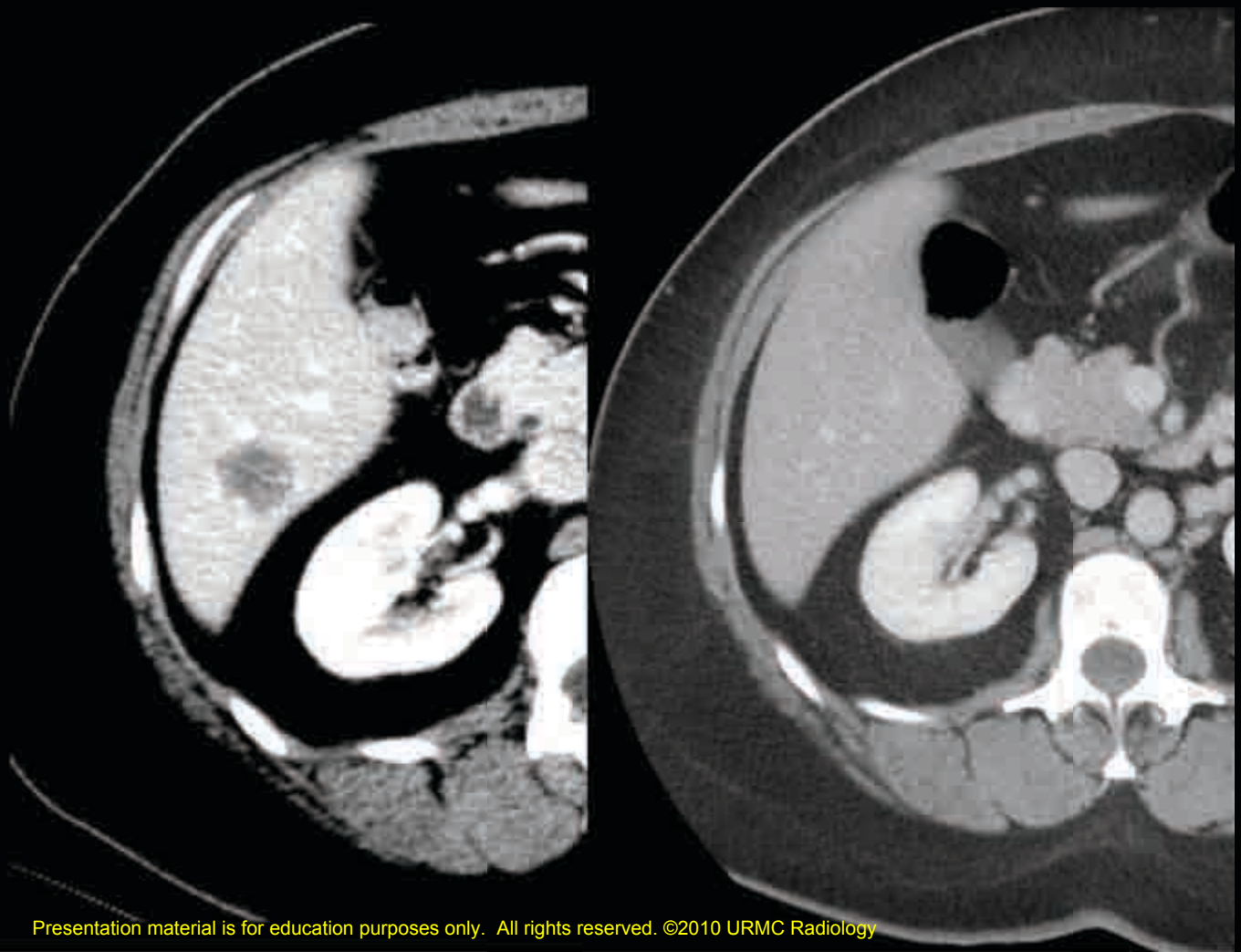
Case 1

- What would you do with Finding 1?



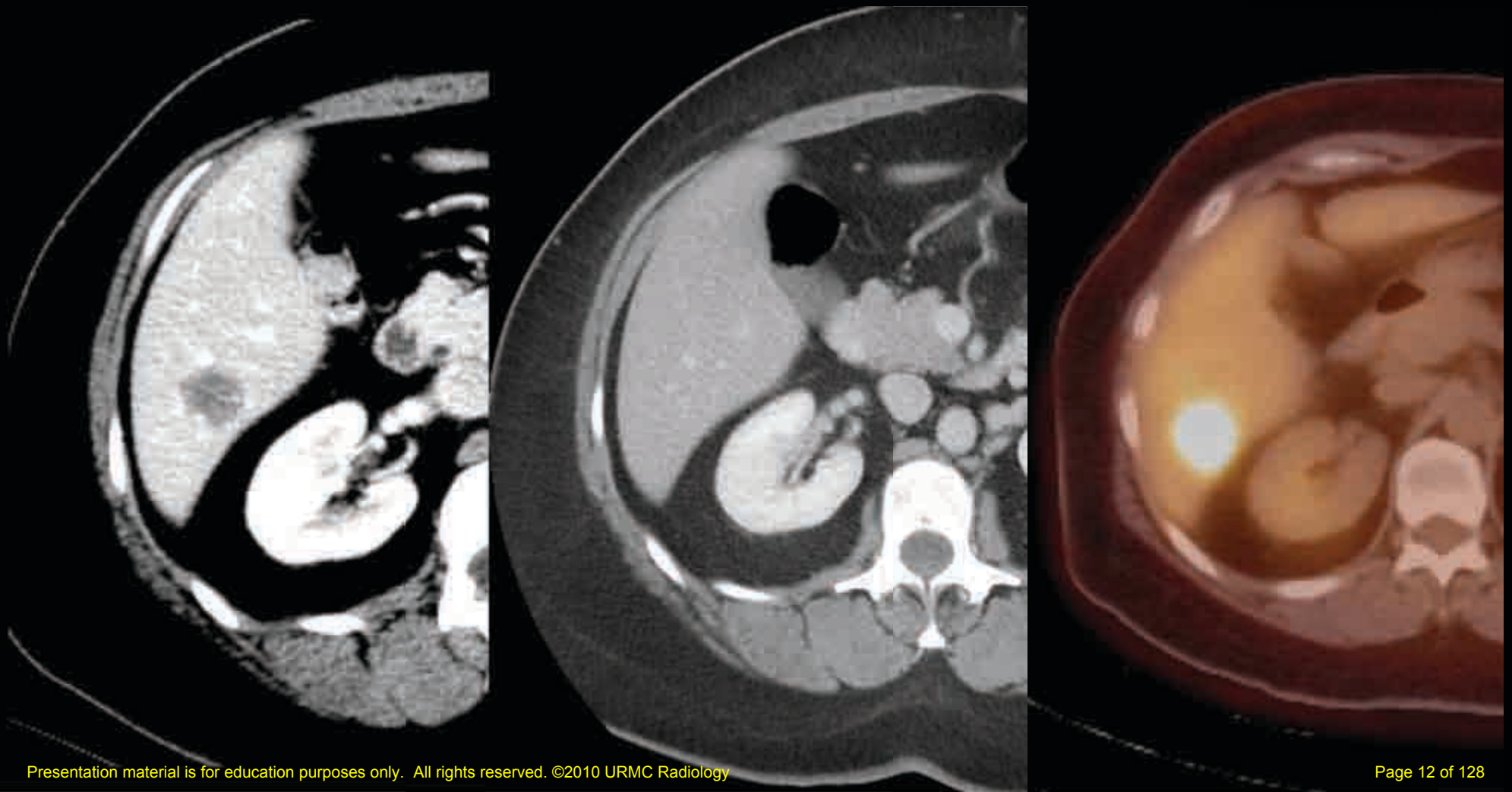
Case 1

- What would you do with Finding 1?



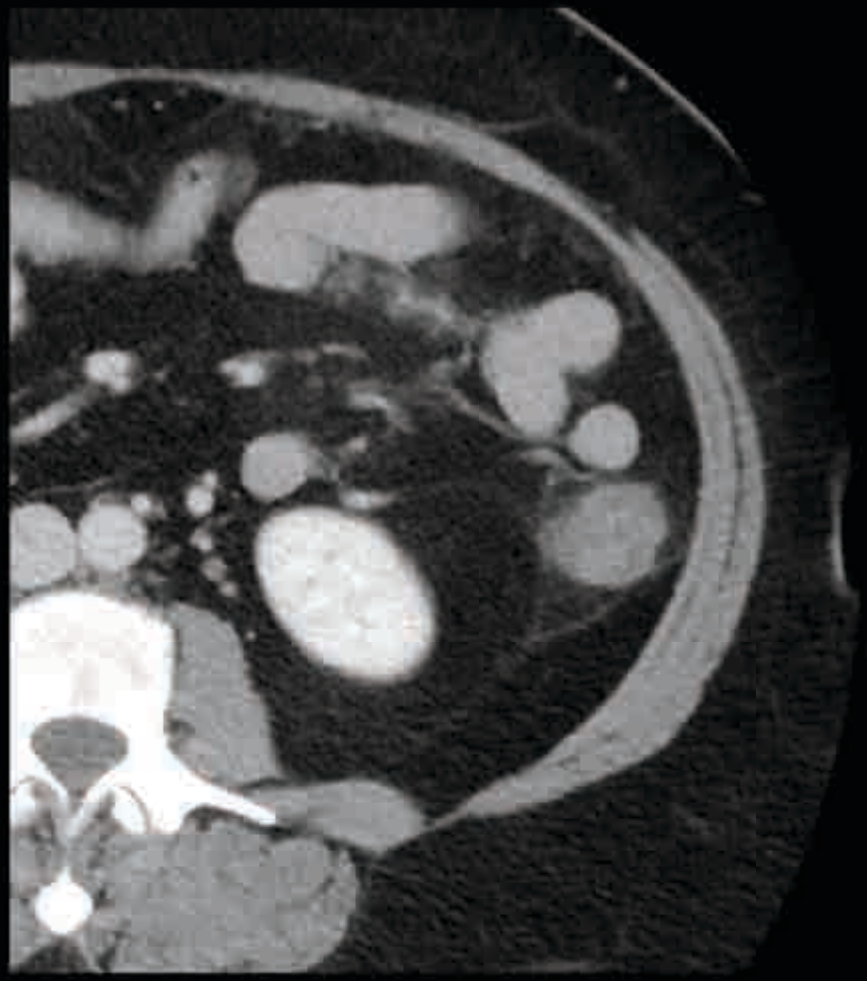
Case 1

- What would you do with Finding 1?



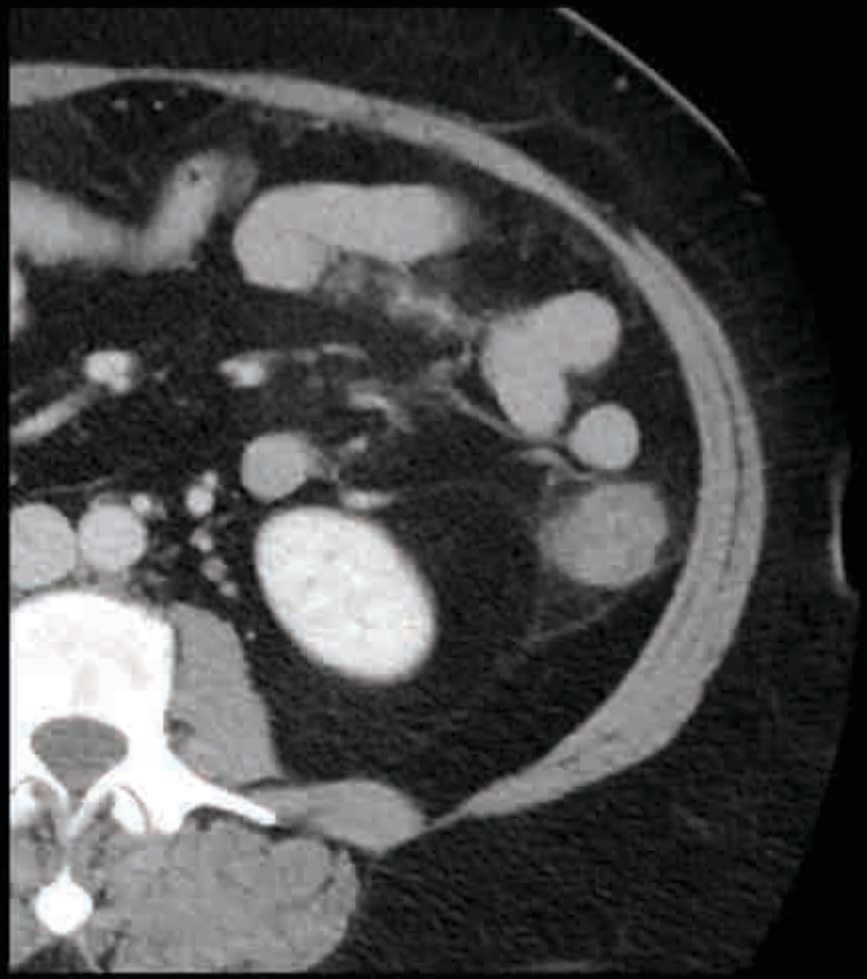
Case 1

- Finding 2?



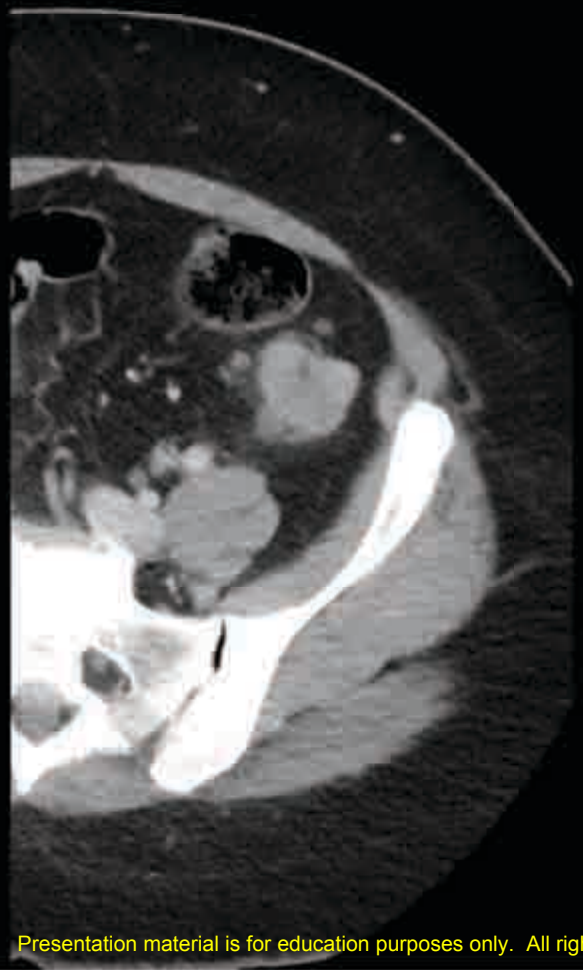
Case 1

- Finding 2?



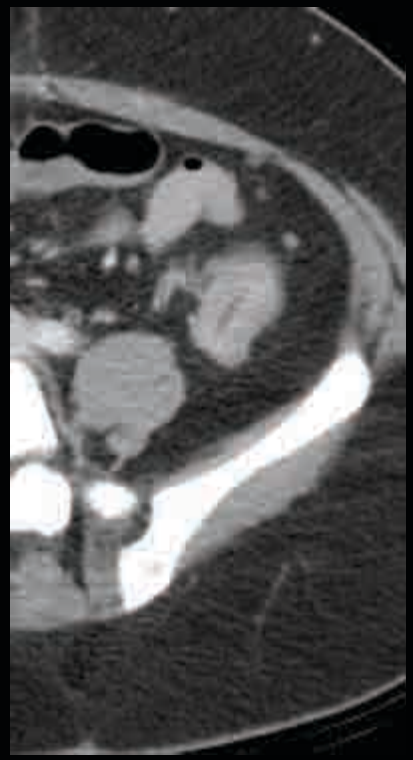
Case 1

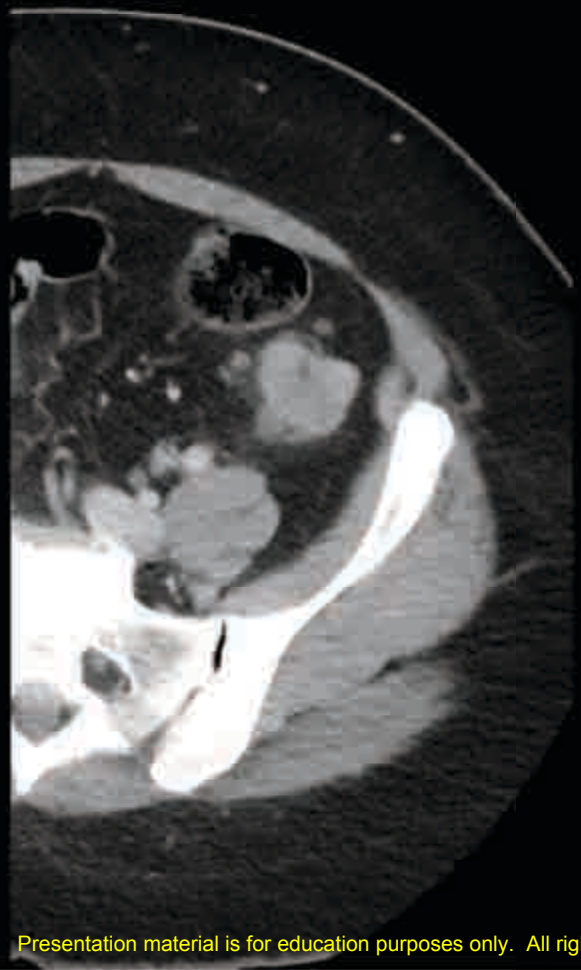
- Finding 3?



Case 1

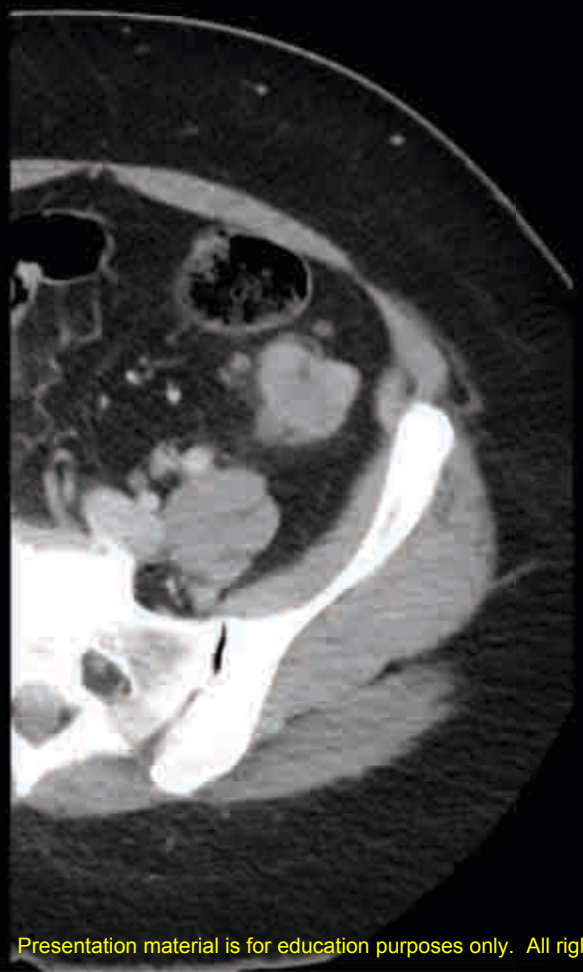
- Finding 3?

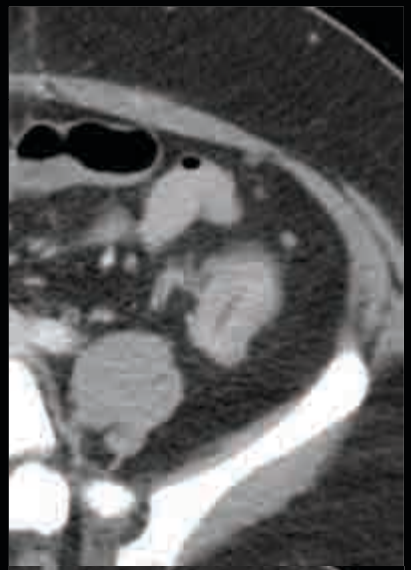




Case 1

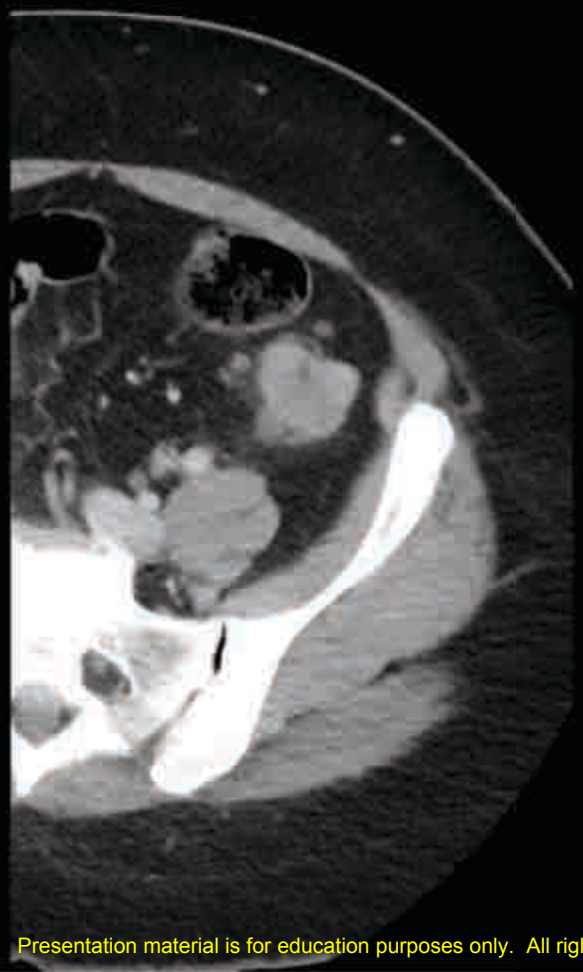
- Finding 3?

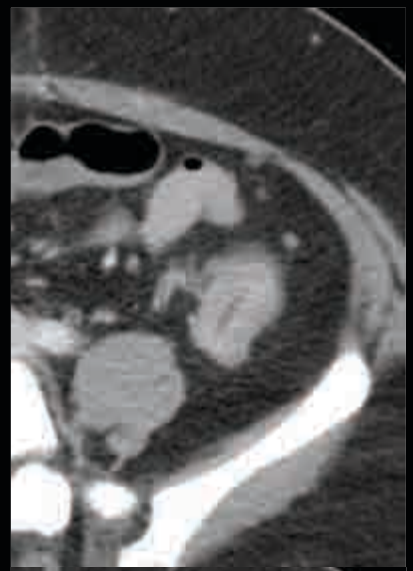




Case 1

- Finding 3?

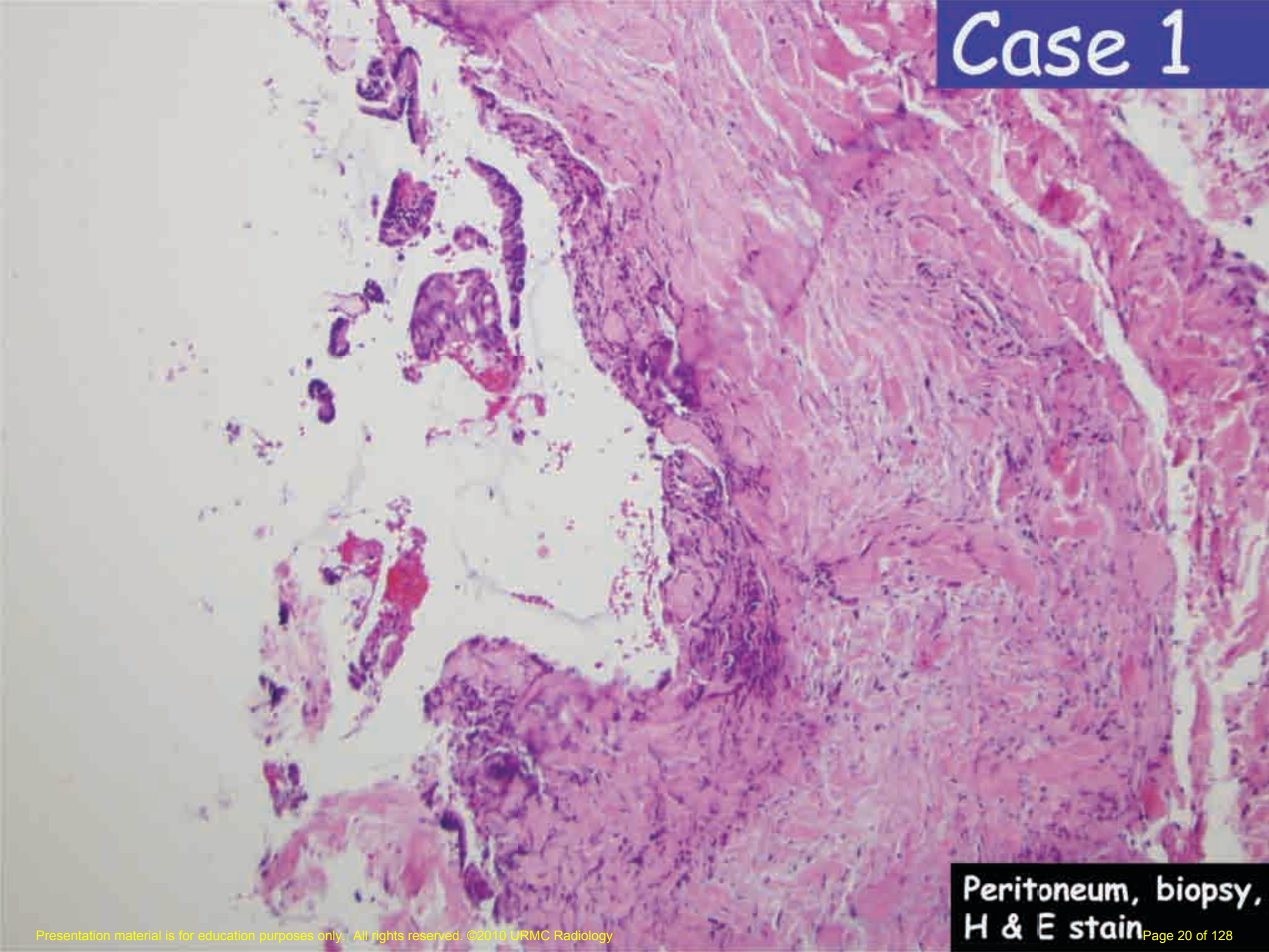




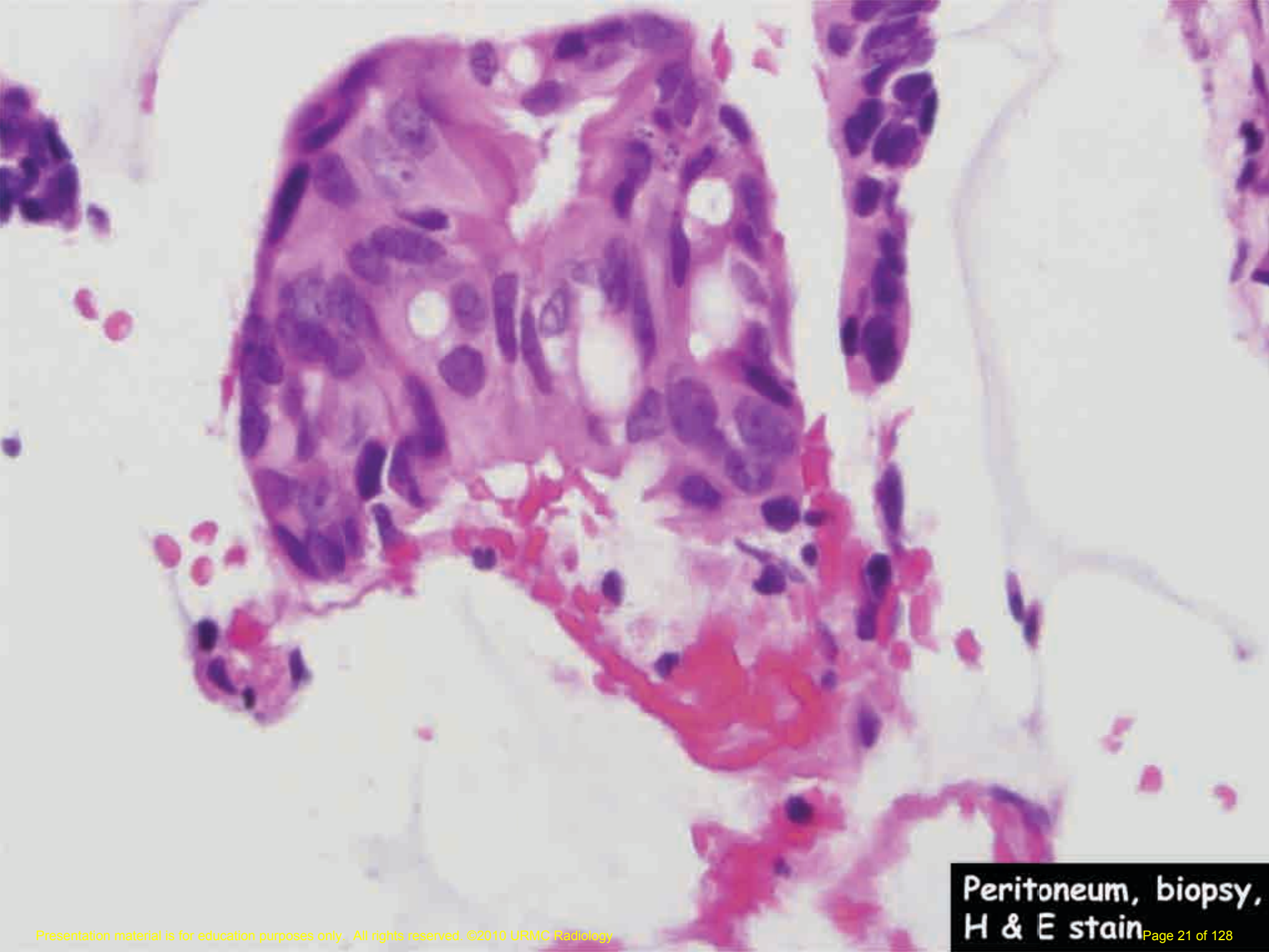
Case 1

- One of the peritoneal nodules was biopsied
- Case 1 PATH

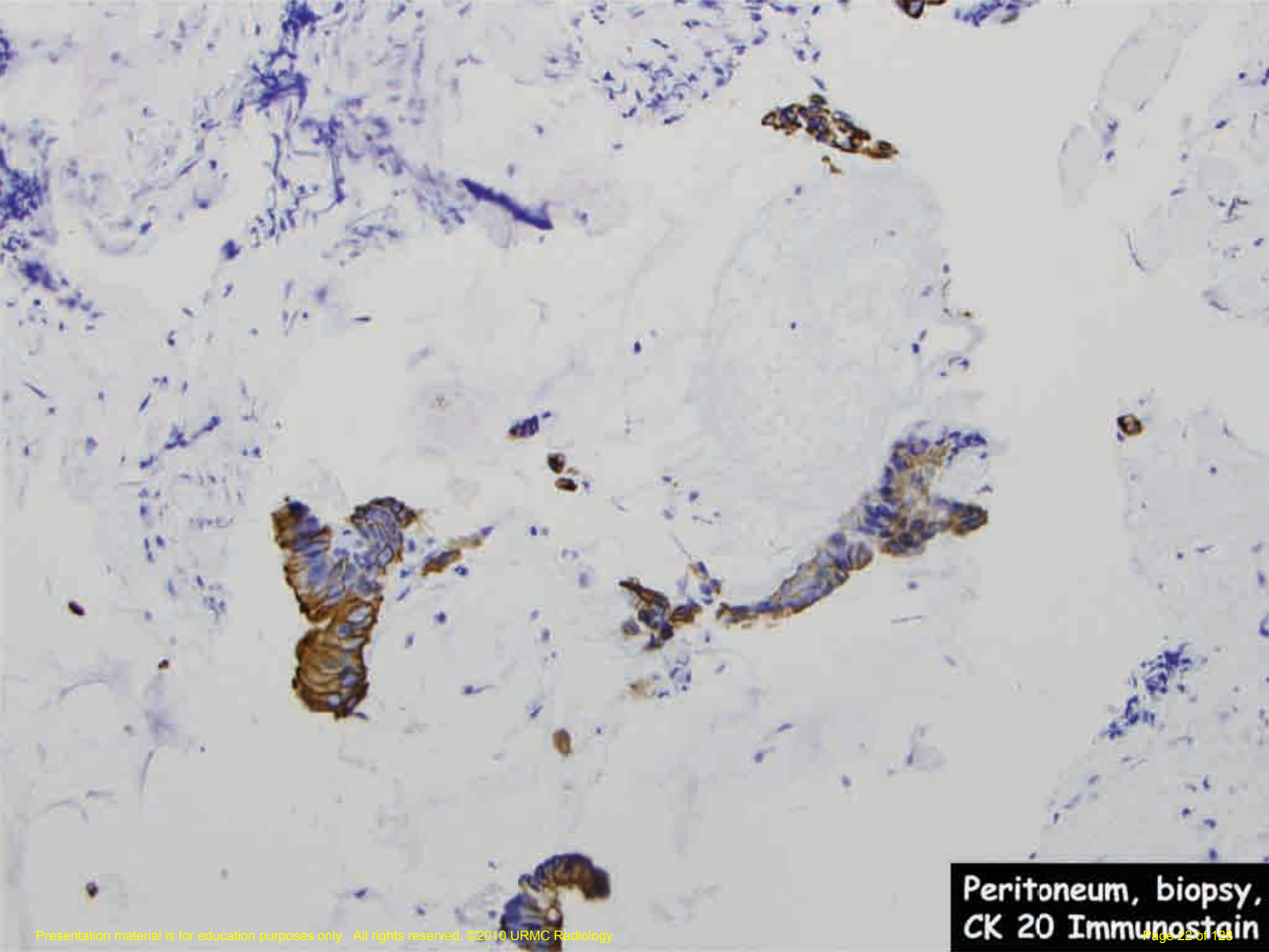
Case 1

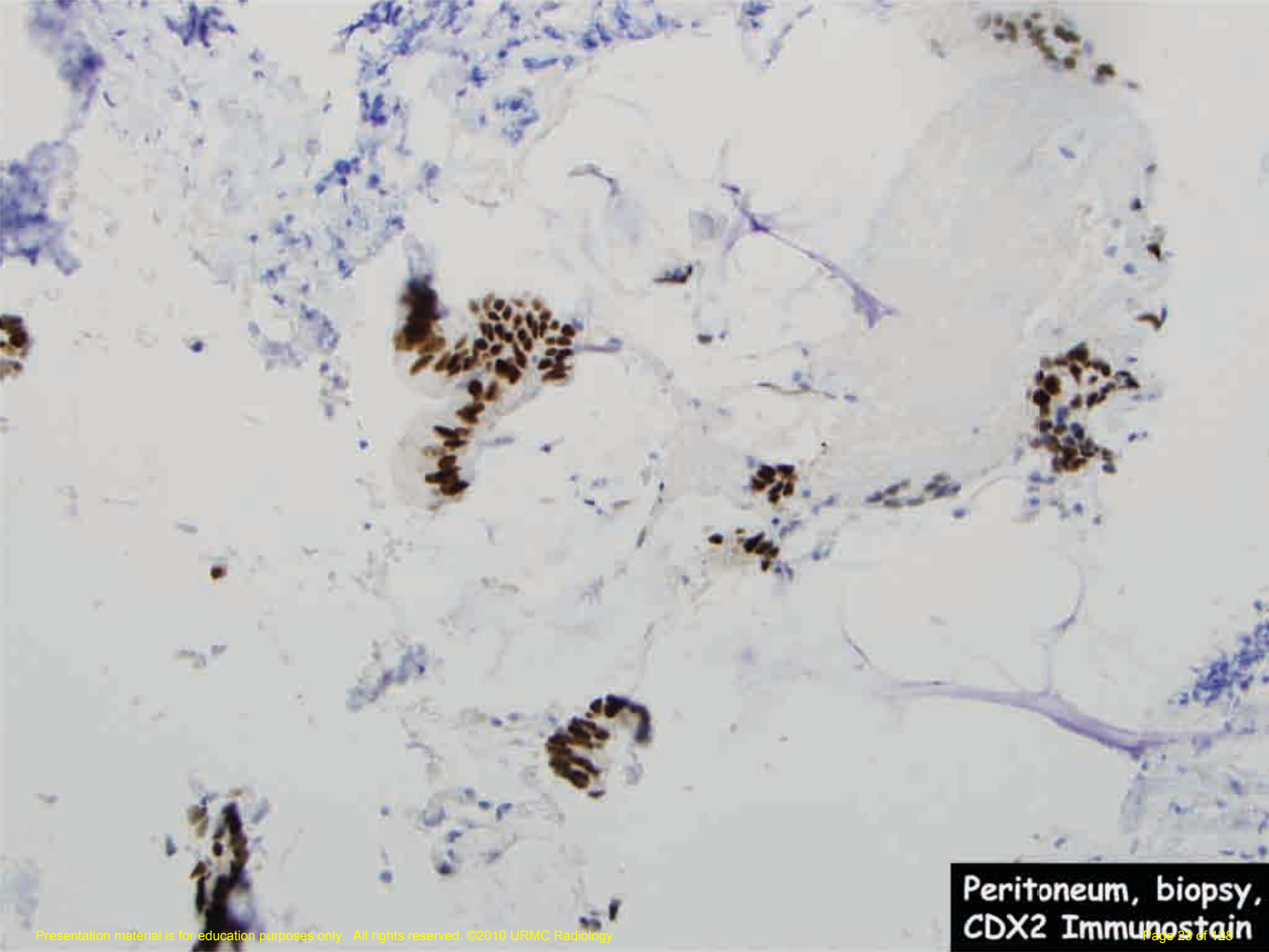


Peritoneum, biopsy, H & E stain



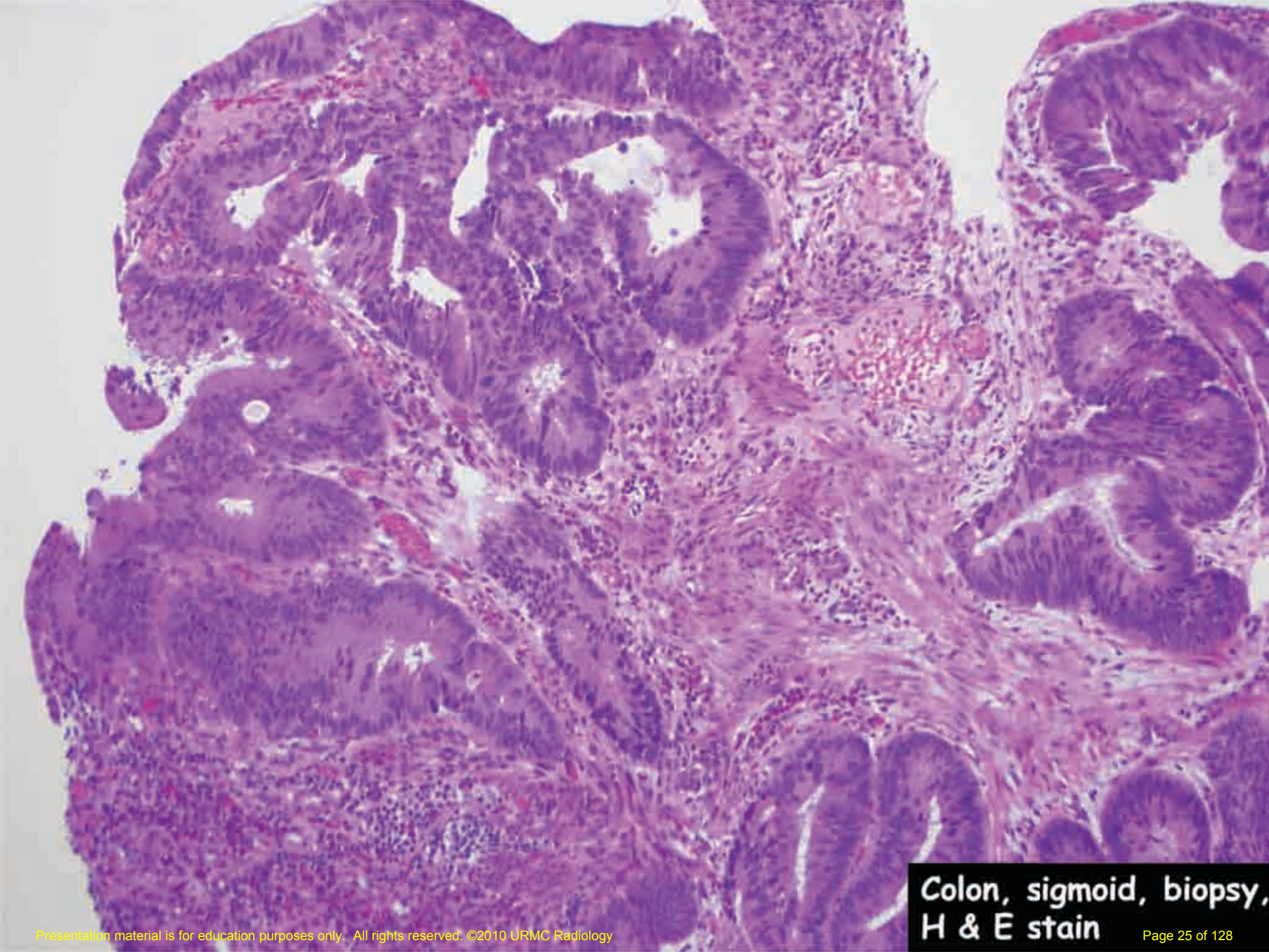
Peritoneum, biopsy, H & E stain



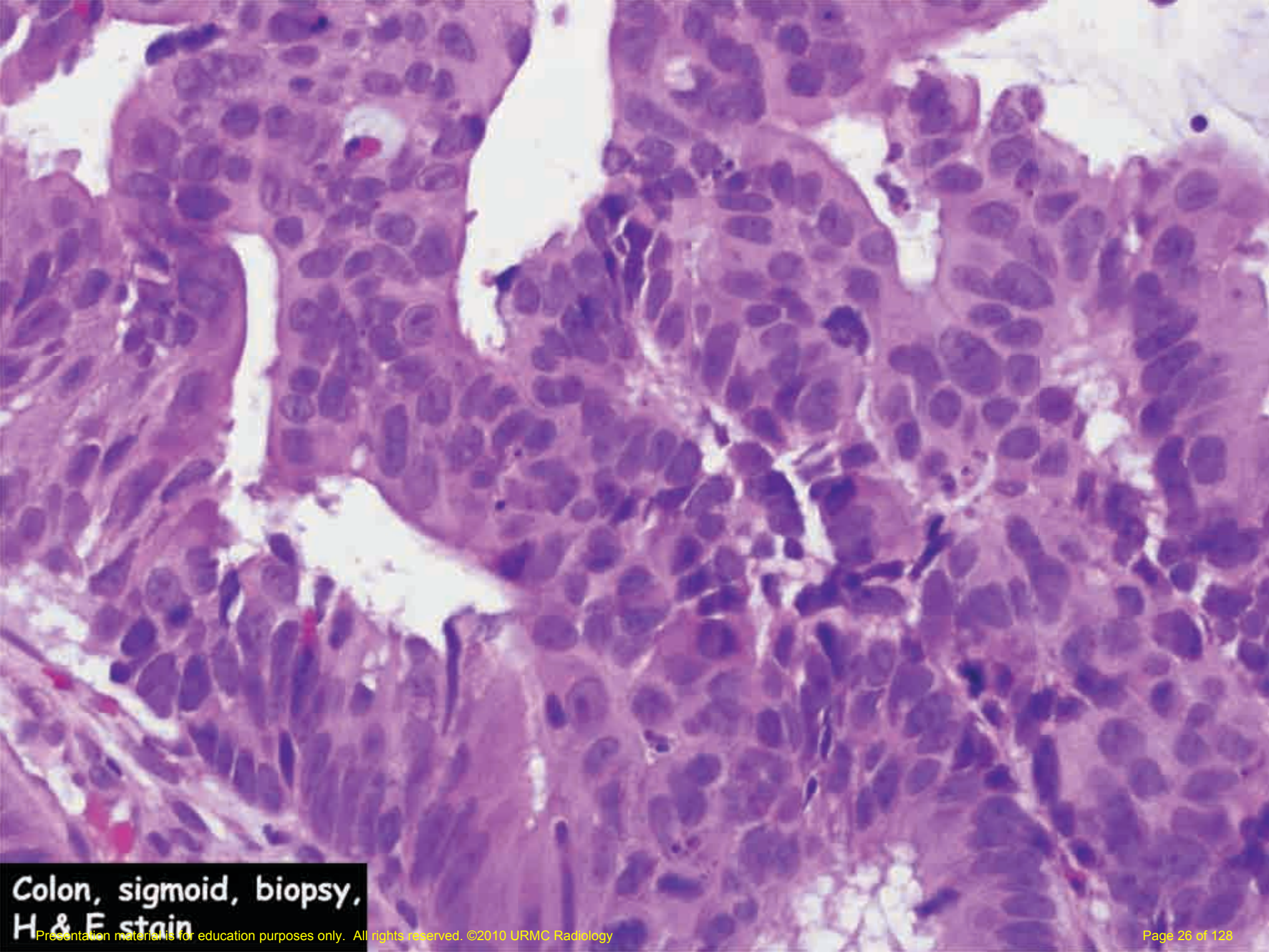


Peritoneum, biopsy (at time of cholecystectomy):

Involved by adenocarcinoma, consistent with colonic origin. Immunohistochemical stains for CK20 and CDX2 are positive. CK7 and CA125 are negative. Mucicarmine histochemical stain is positive. This staining pattern suggests colonic origin.



Colon, sigmoid, biopsy, H & E stain



Colon, sigmoid, biopsy:

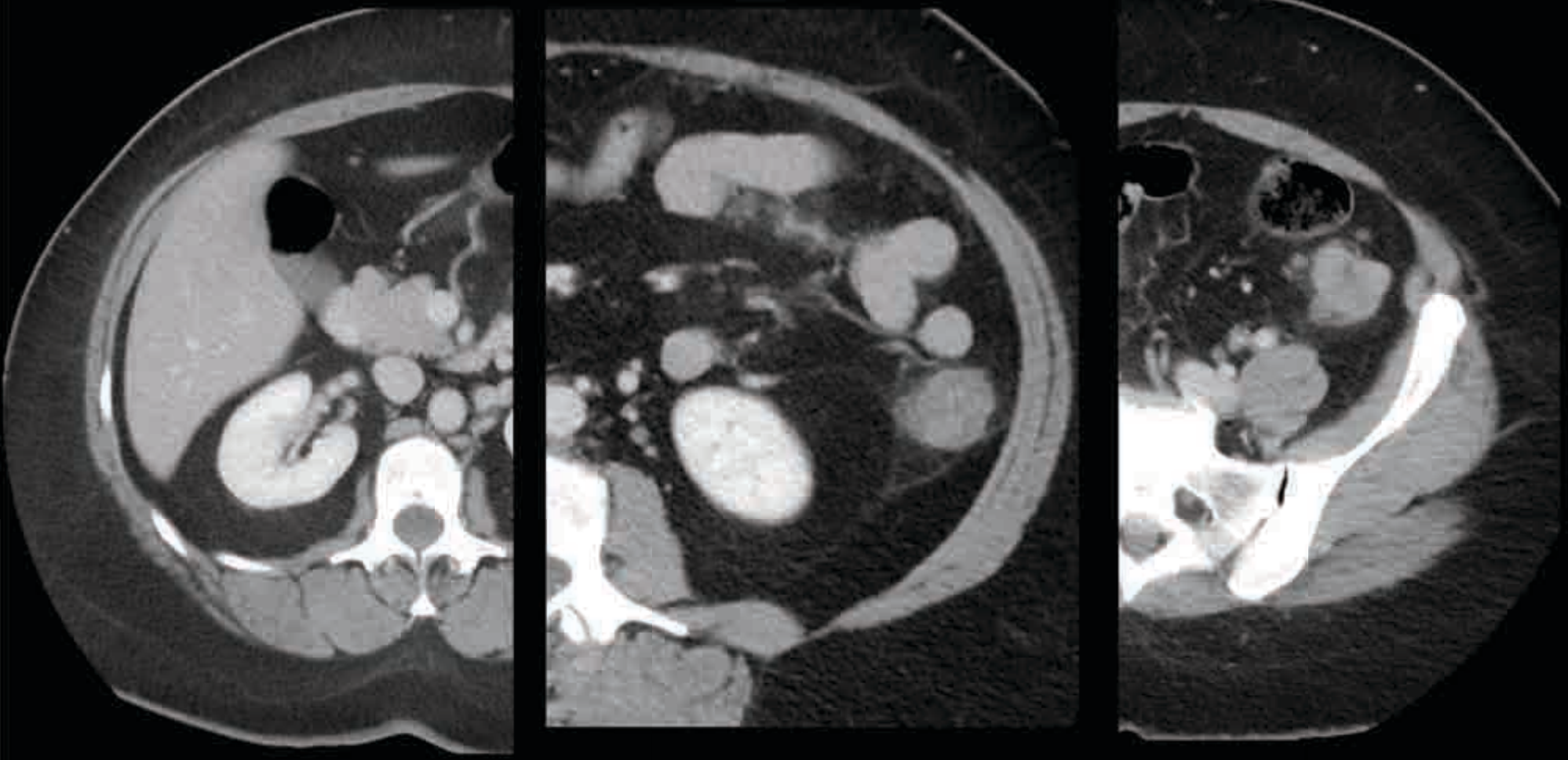
Well differentiated adenocarcinoma.

Colon Carcinoma

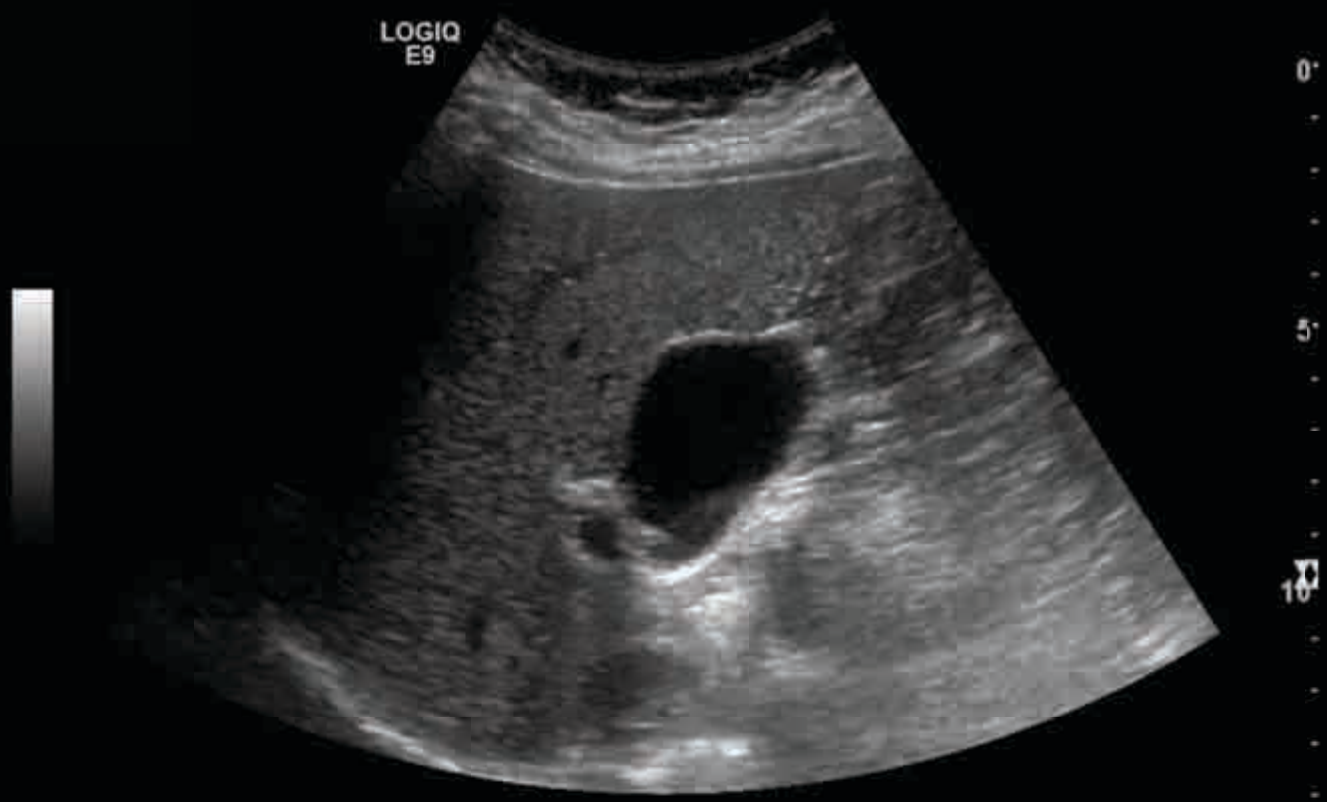
- Vast majority are adenocarcinoma
- #2 cause of cancer death in US
- Risk factors: older age, obesity, IBD, polyposis syndrome, diet, family history
- Clinical presentation: rectal bleeding, anemia, change in bowel habits, abdominal pain
- Metastasis: most common to regional lymph nodes and liver, less likely peritoneum, ovary, lung

Case 1

- 50 year old female with abdominal pain



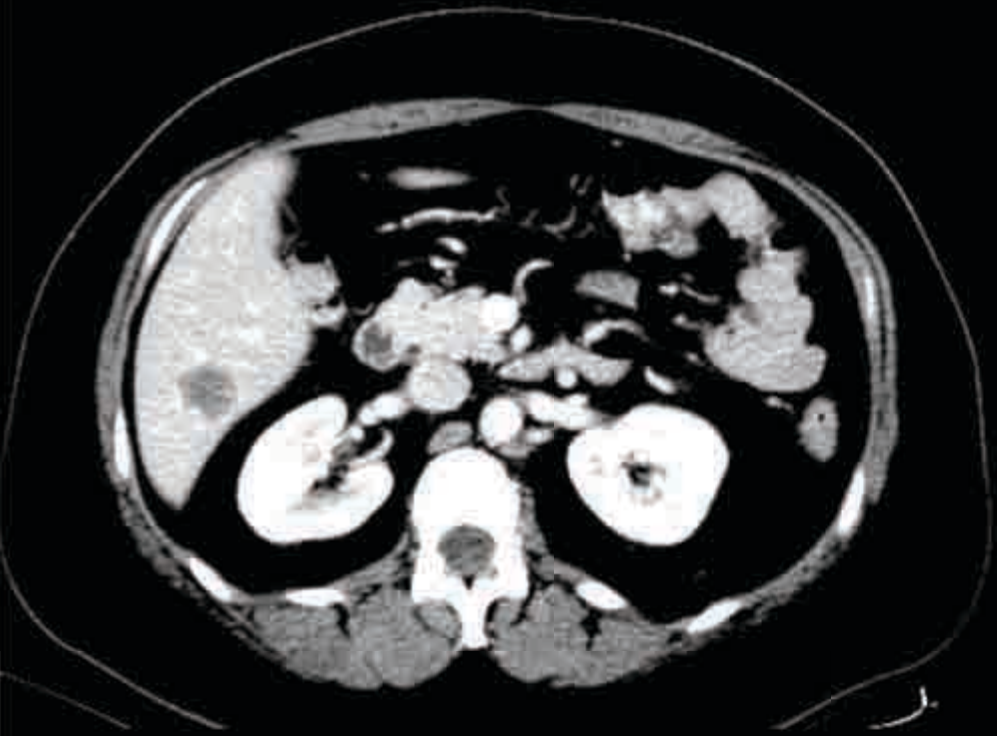
Case 1



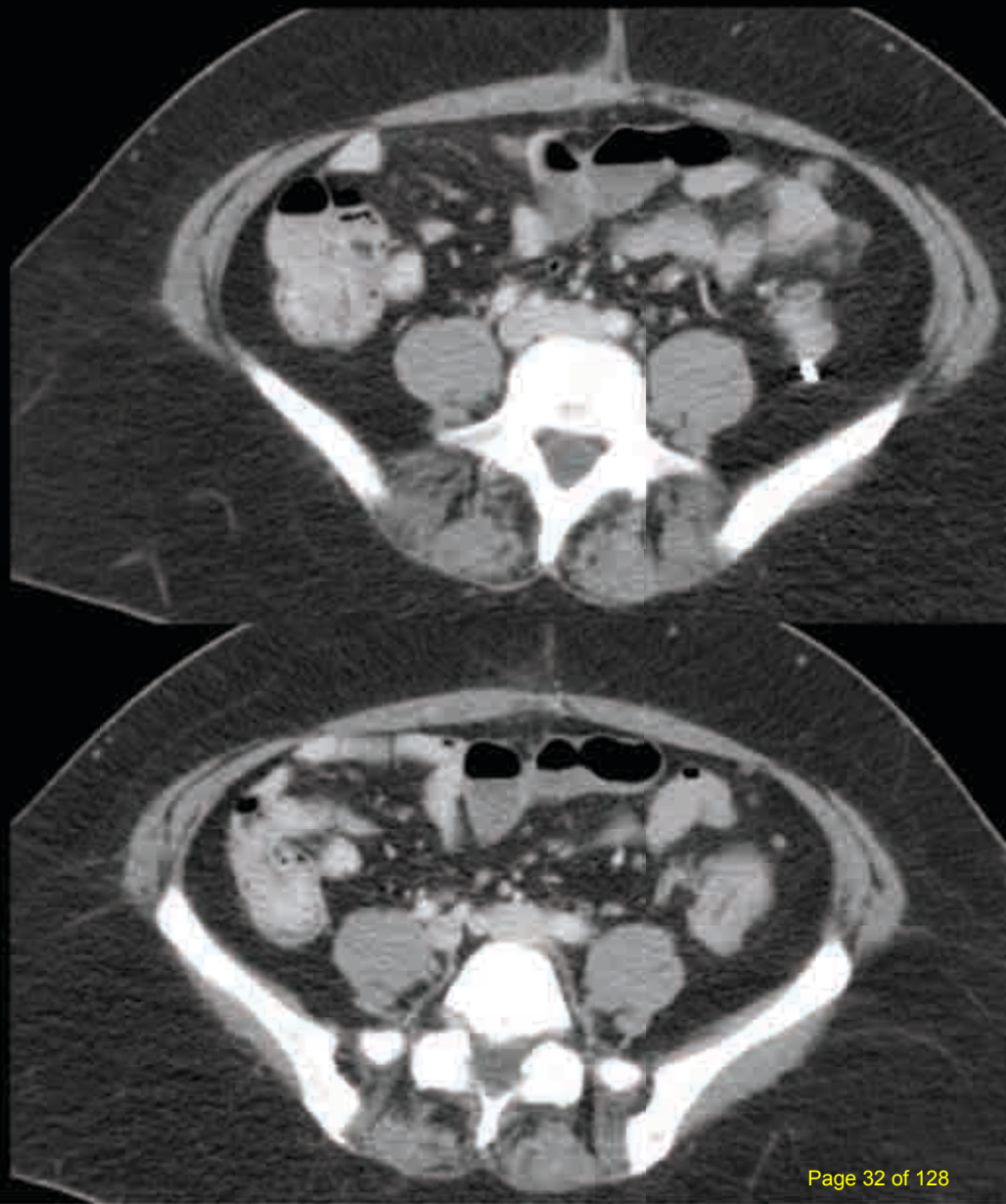
Case 1

- Outside hospital HIDA suggested biliary dyskinesia
- During cholecystectomy surgeon finds peritoneal nodules and biopsies them

Case 1

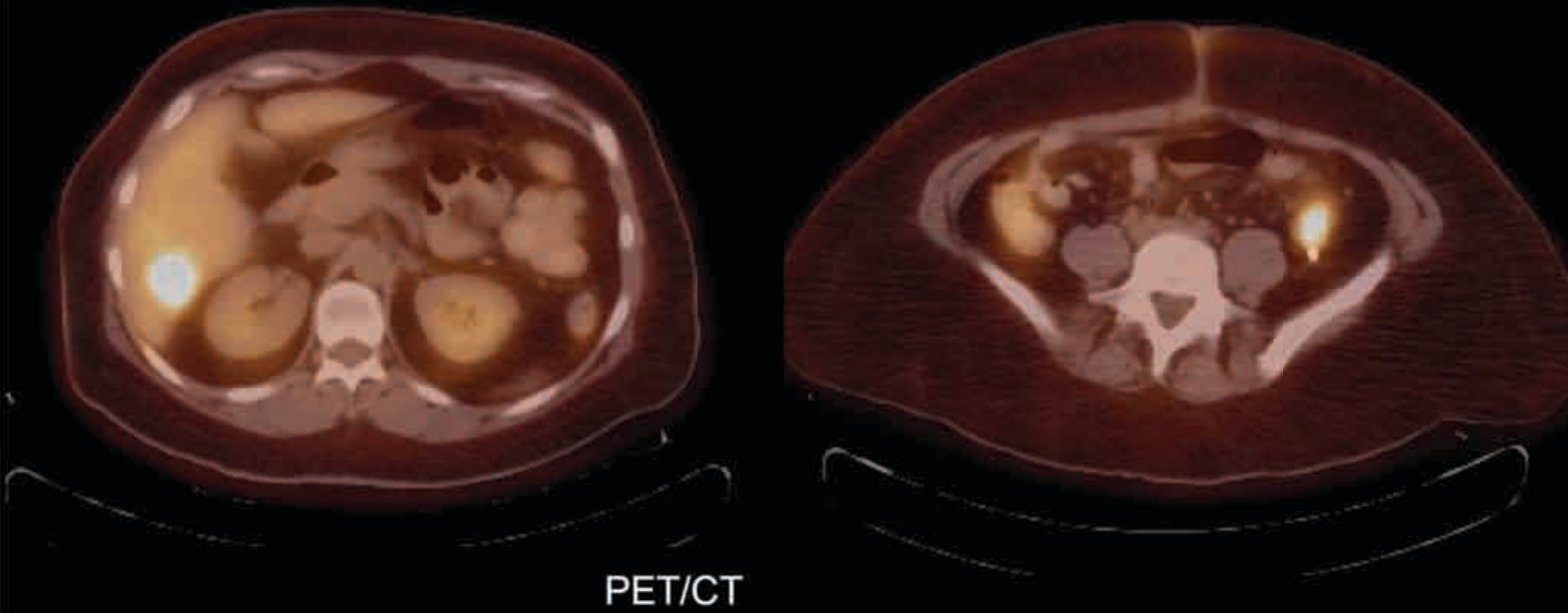


PET/CT



Case 1

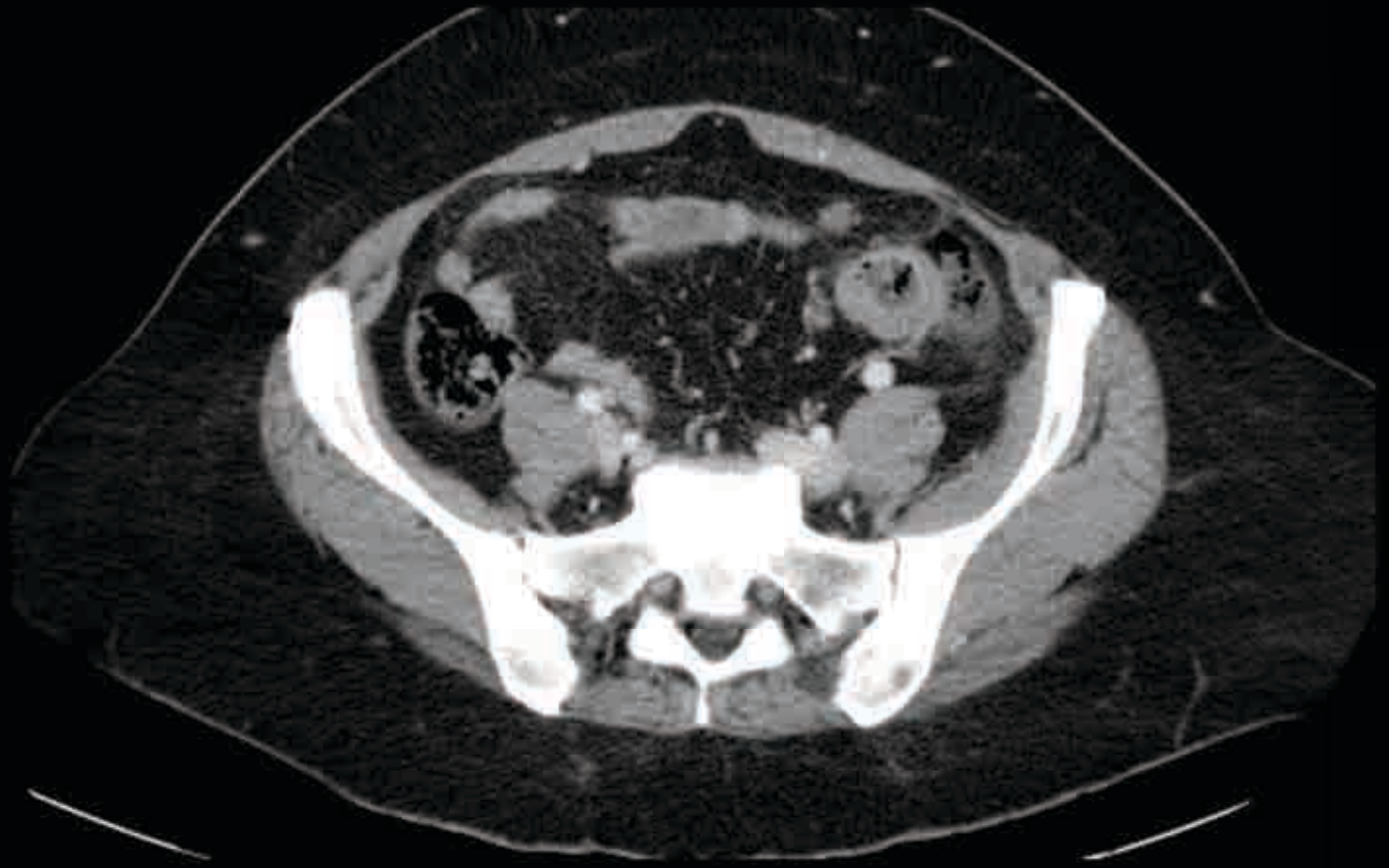
- Metastatic disease, stage D



PET/CT

Case 1

- After chemotherapy



Case 1

- Key points:
  - Be wary of subtle but real findings
  - Would it make a difference in this patient?

Staging, Grading, or Classification Criteria

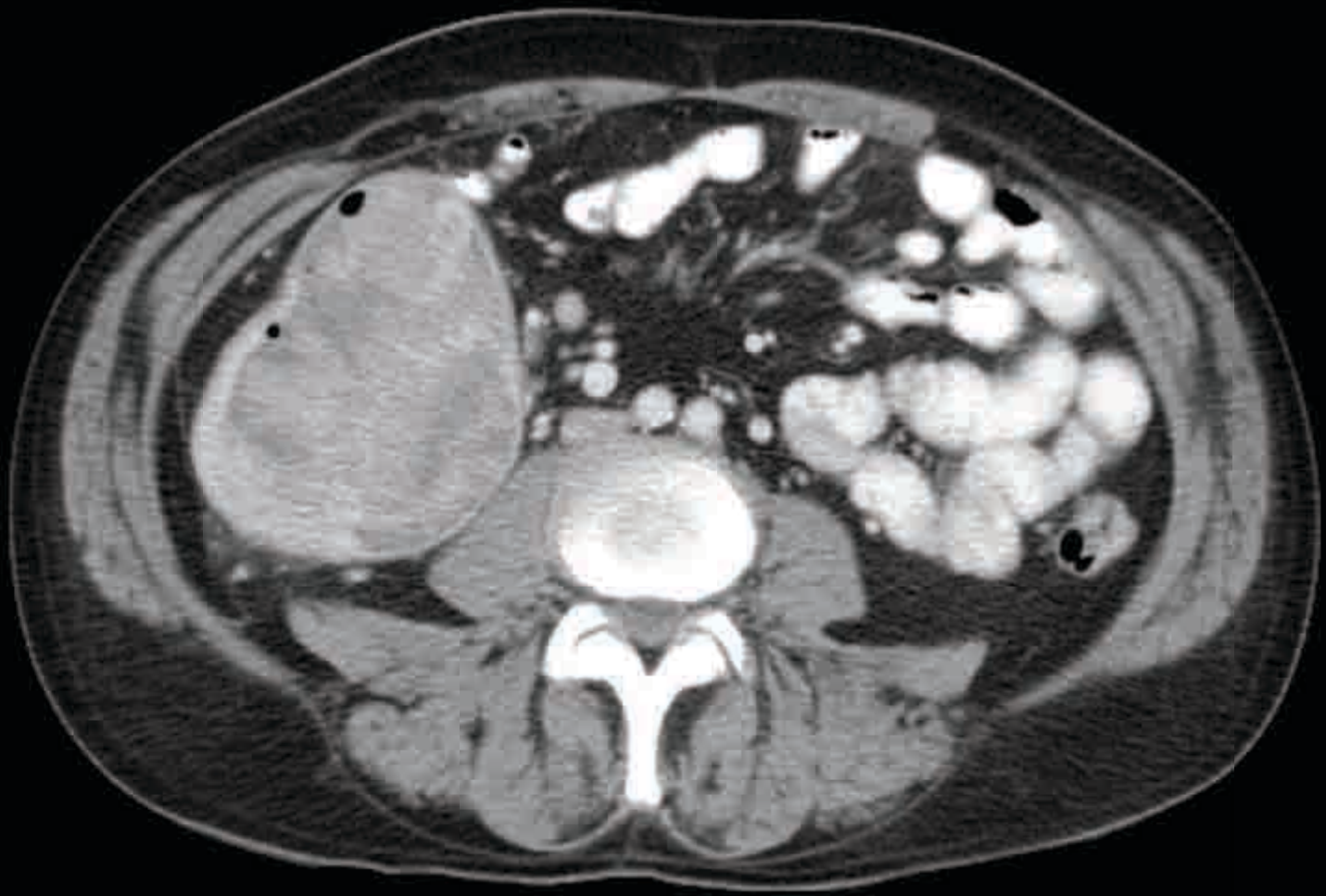
- Surgical-pathologic (modified Dukes) staging of colon cancer with TNM correlation
  - Stage A (T1N0M0): Limited to mucosa ± submucosa
  - Stage B (T2 or 3 & N0M0): Limited to serosa or into adjacent tissues
  - Stage C (T2 or 3 & N1M0): Lymph node metastases
  - Stage D (any T and N, M1): Distant metastases

  - Early detection could improve prognosis

- Prognosis
  - Overall 5 year survival is 50%
    - Duke's stage A: 81-85%
    - Duke's stage B: 64-78%
    - Duke's stage C: 27-33%
    - Duke's stage D: 5-14%

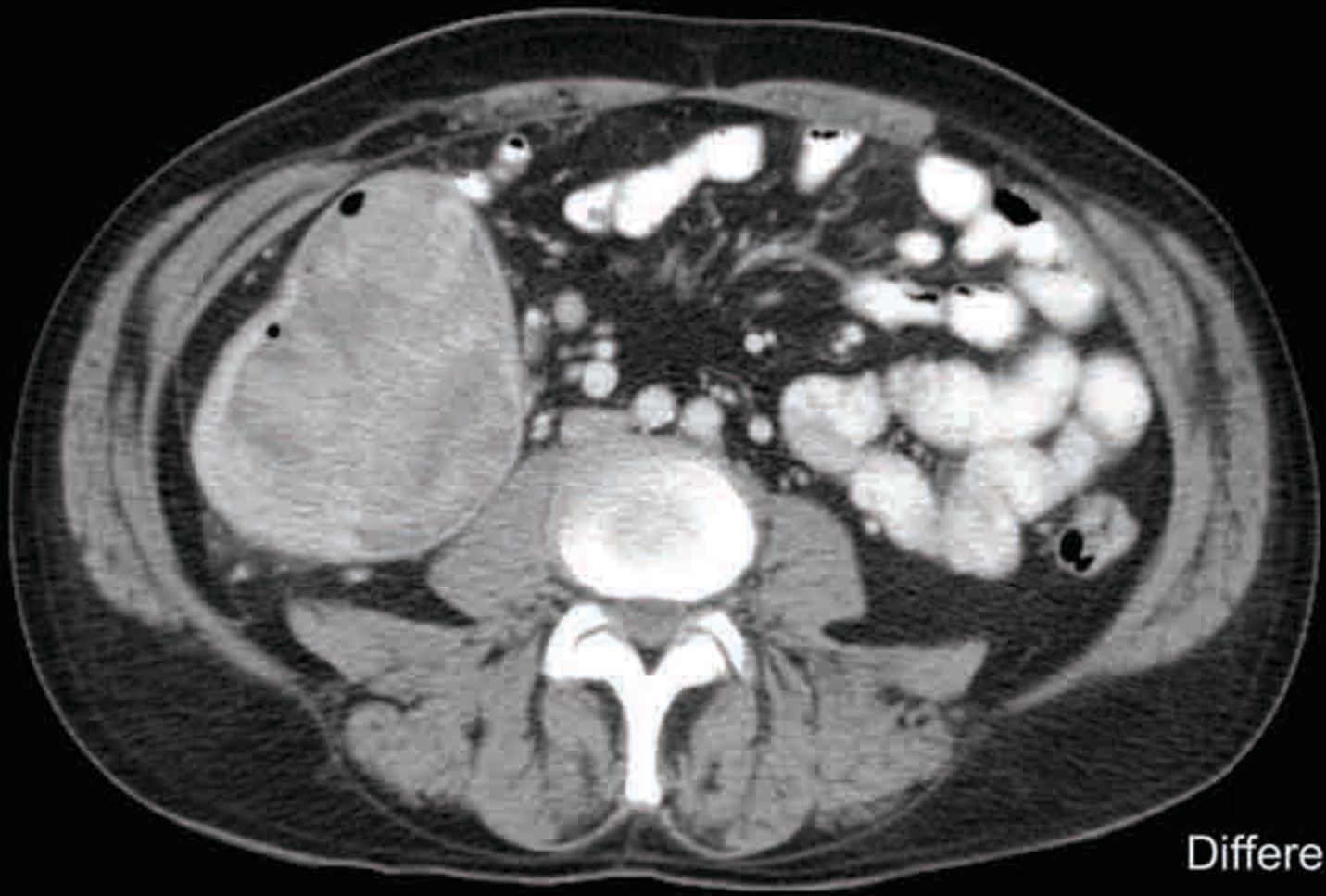
Case 2

- 69 year old male with fever of unknown origin



Case 2

- 69 year old male with fever of unknown origin



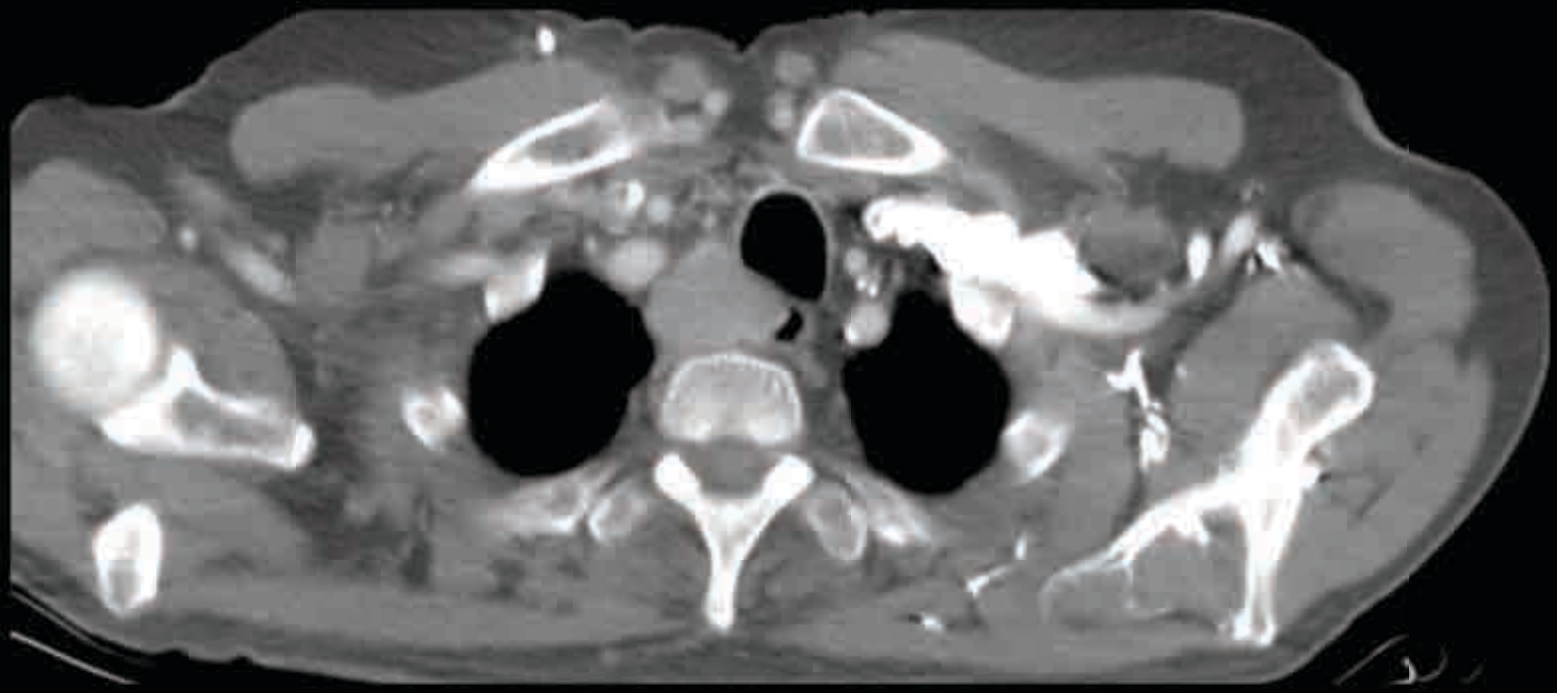
Differential?

Case 2

- Right cecal mass differential
  - Malignancy:
    - Metastasis (melanoma, lymphoma)
    - Colon cancer (10% in the cecum)
      - Strands of soft tissue extend into the pericolonic fat
      - PET-CT uptake is 2x higher than nonmalignant lesions
  - Benign: Leiomyoma, Lipoma, Fibroma, Myxoma

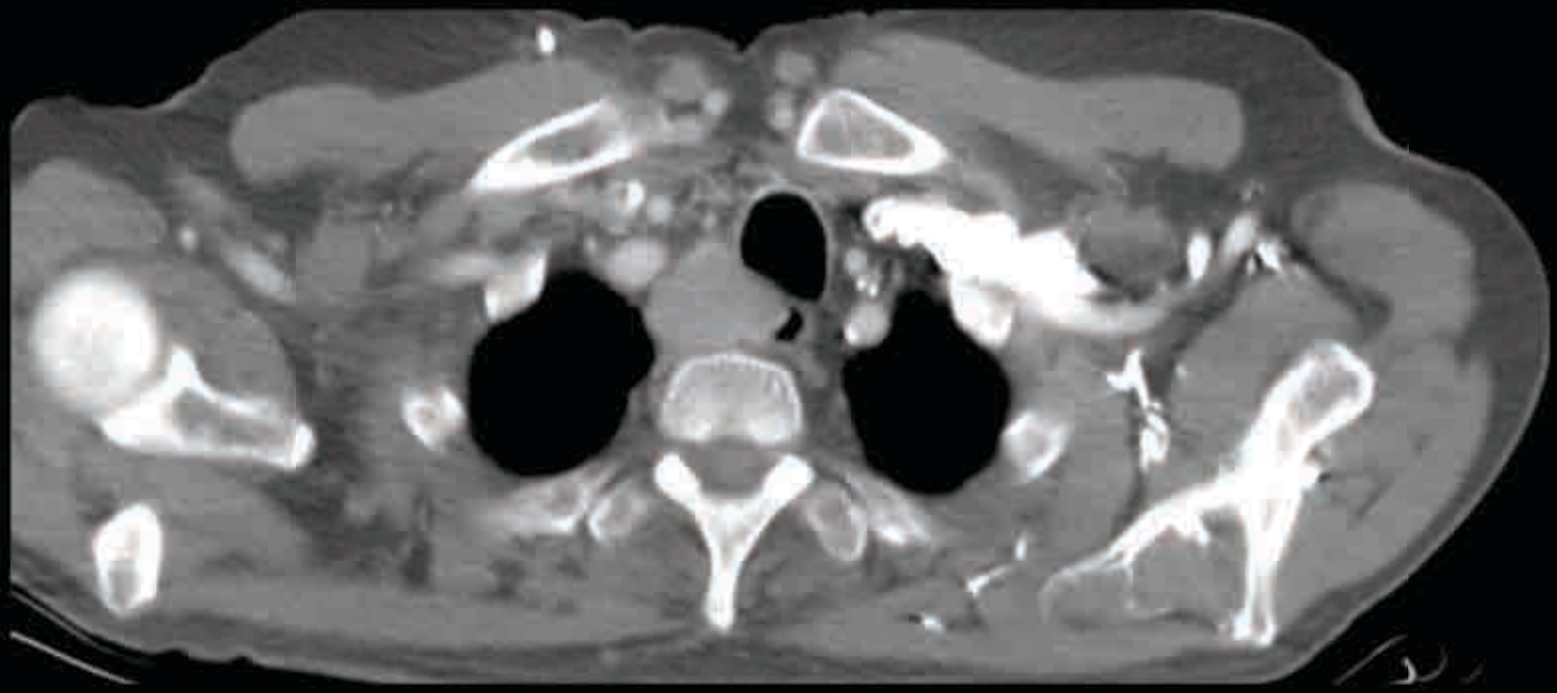
Case 2

- History of colon cancer, status post right colectomy



Case 2

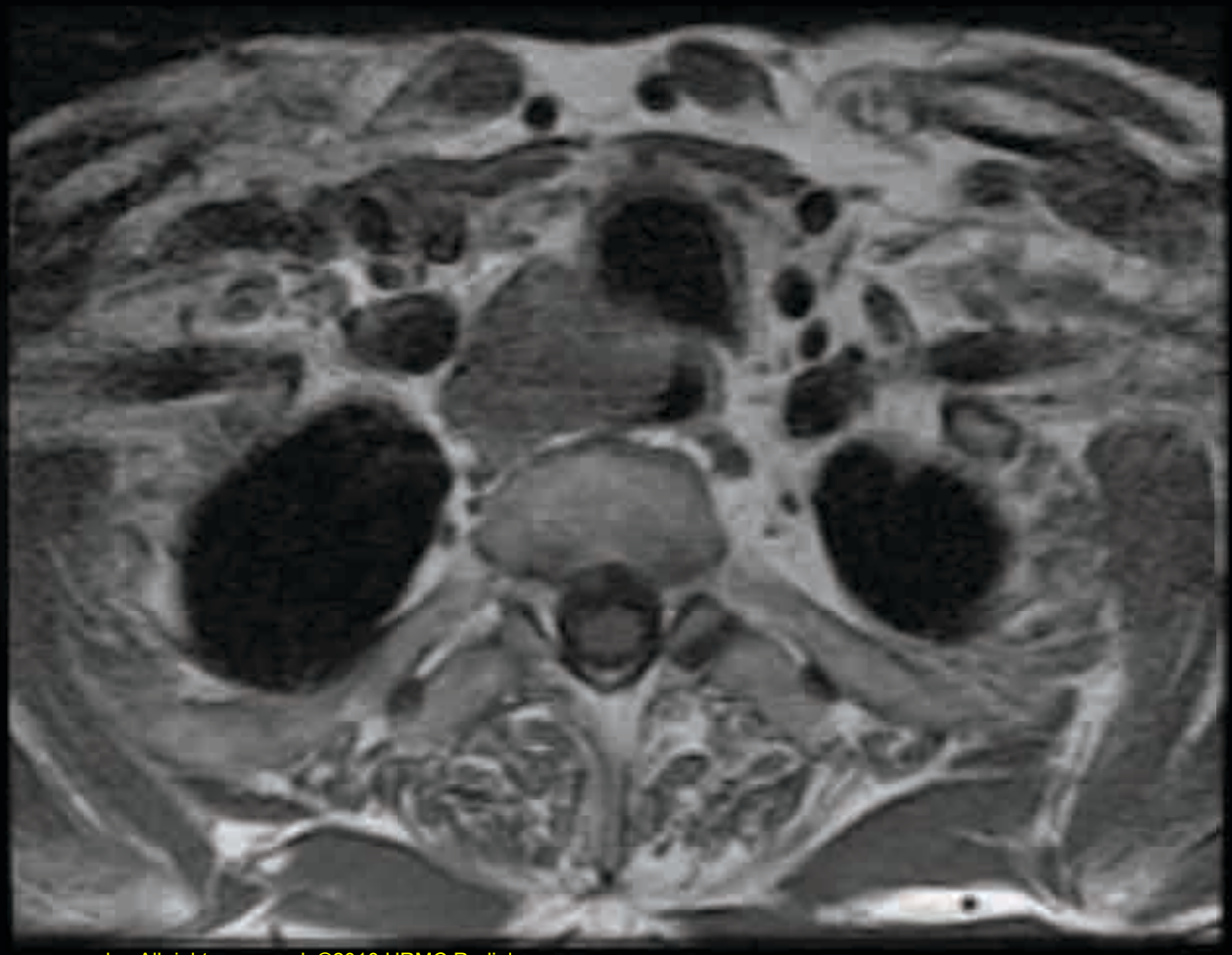
- History of colon cancer, status post right colectomy



Differential?

Case 2

- Does this change your differential?



Case 2

- How about now?

Case 2

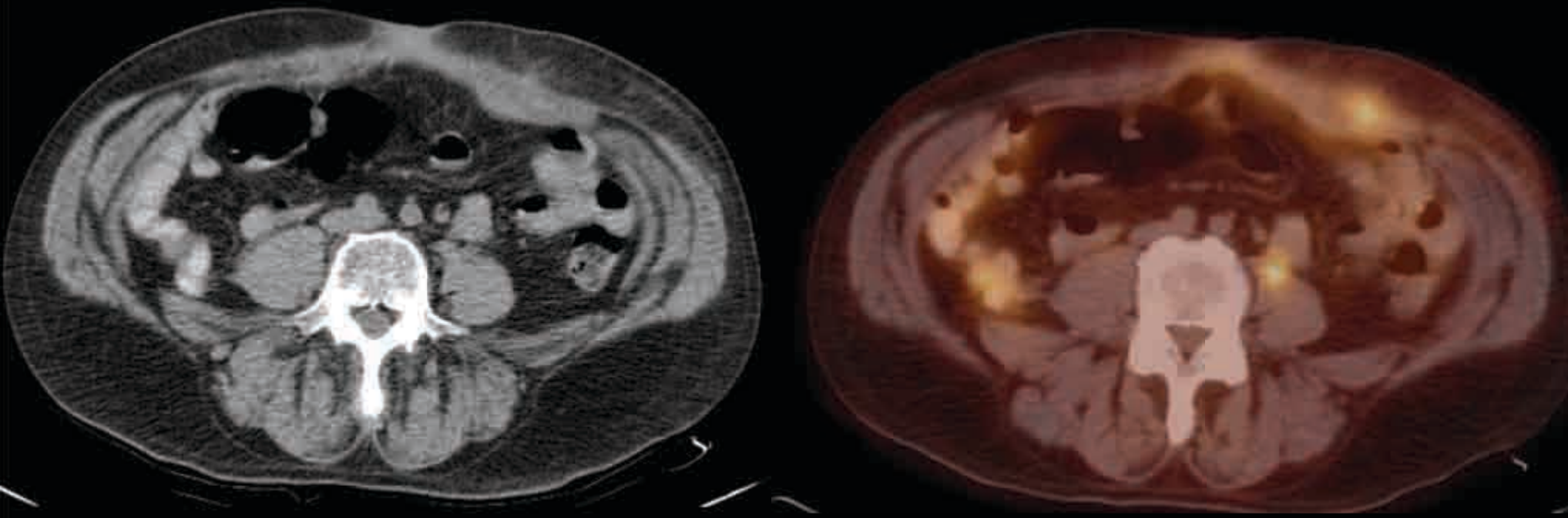
- Right paratracheal mass differential
  - Primary tumor of esophagus or trachea
  - Metastasis to esophagus or less likely lymph node
  - Less likely infection/inflammatory lymph node

Case 2

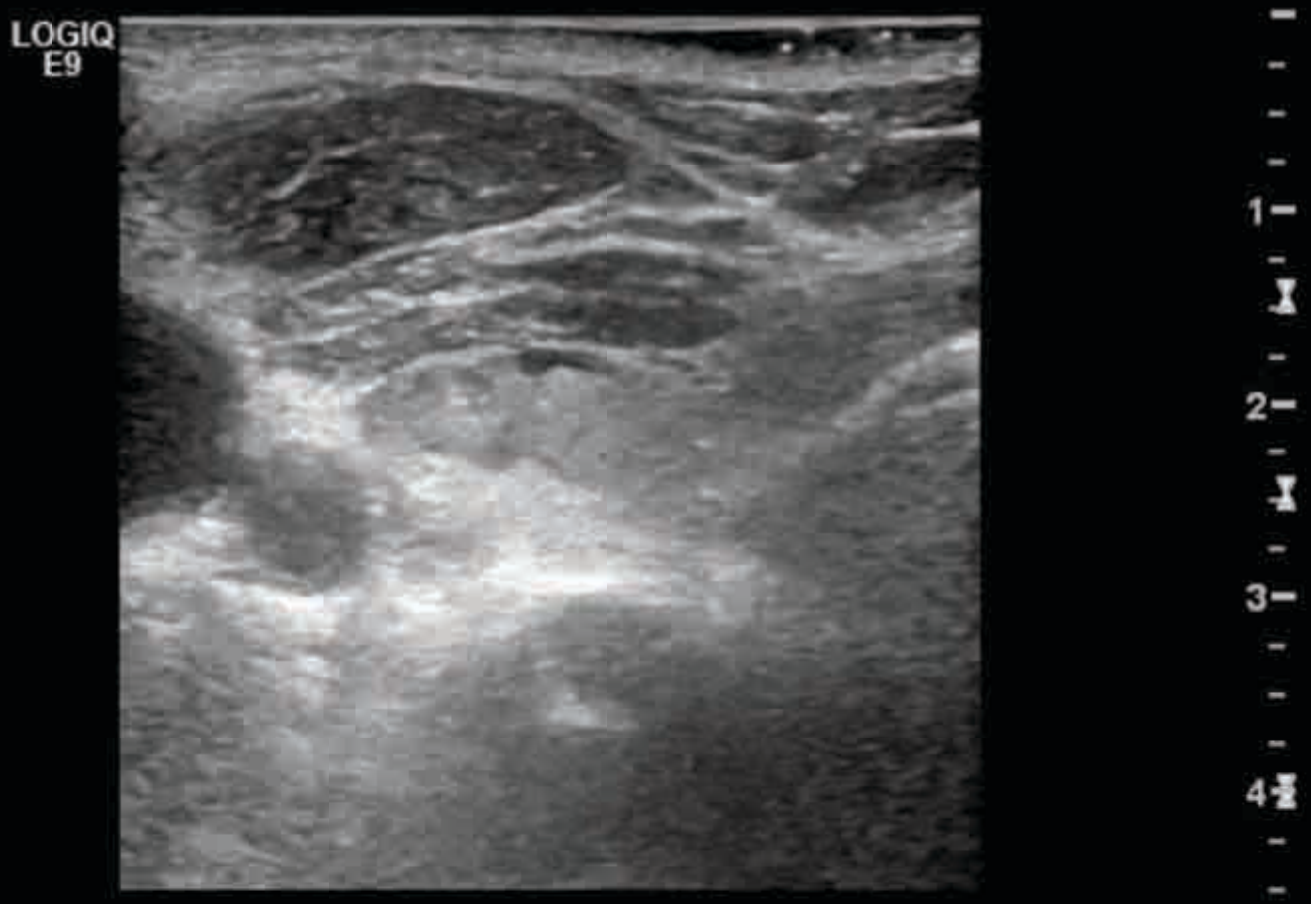
- Does this add information?

Case 2

- Does this add information?

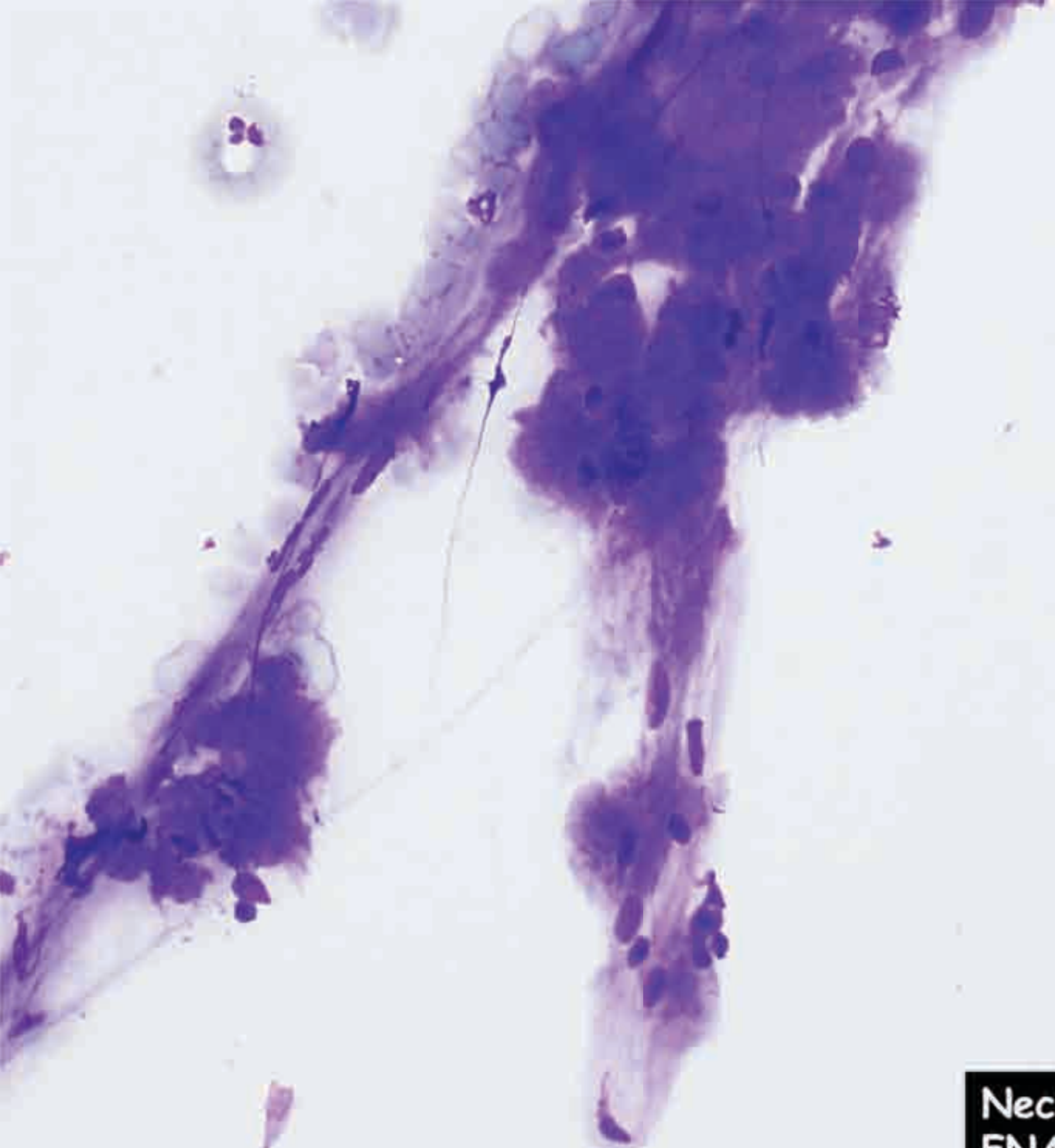


Case 2



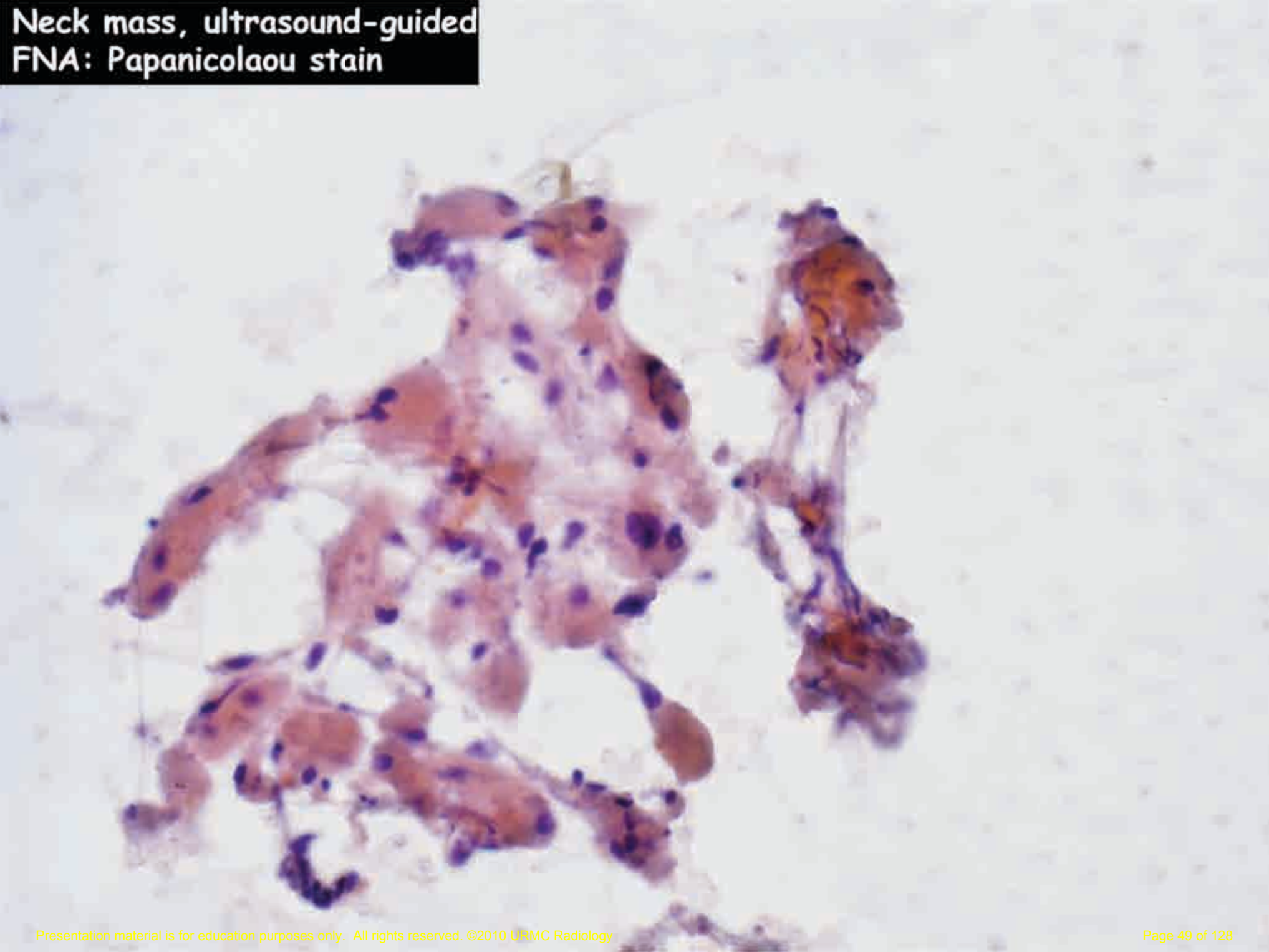
- Case 2 Path

Case 2

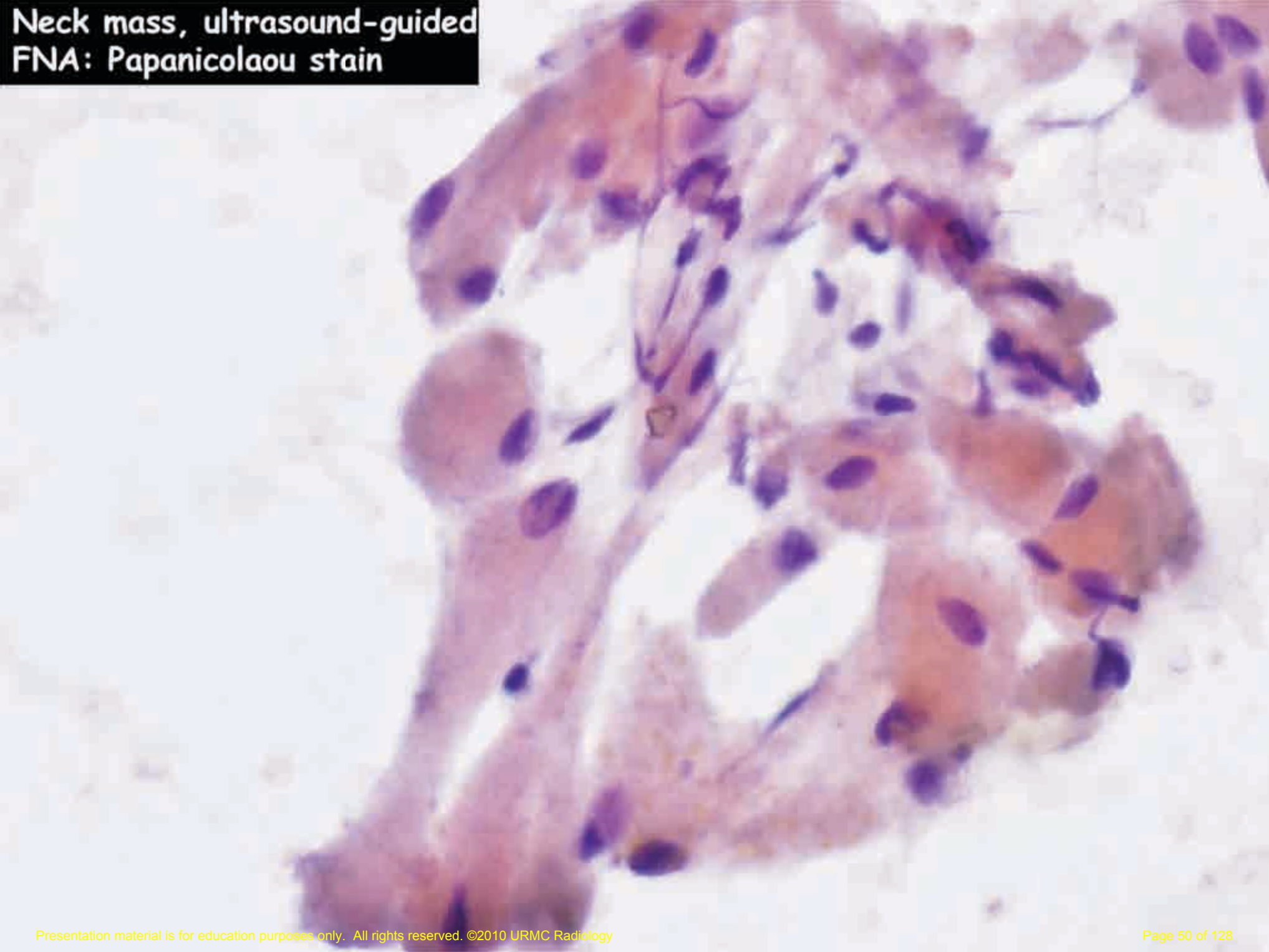


Neck mass, ultrasound-guided FNA: Diff-Quik stain

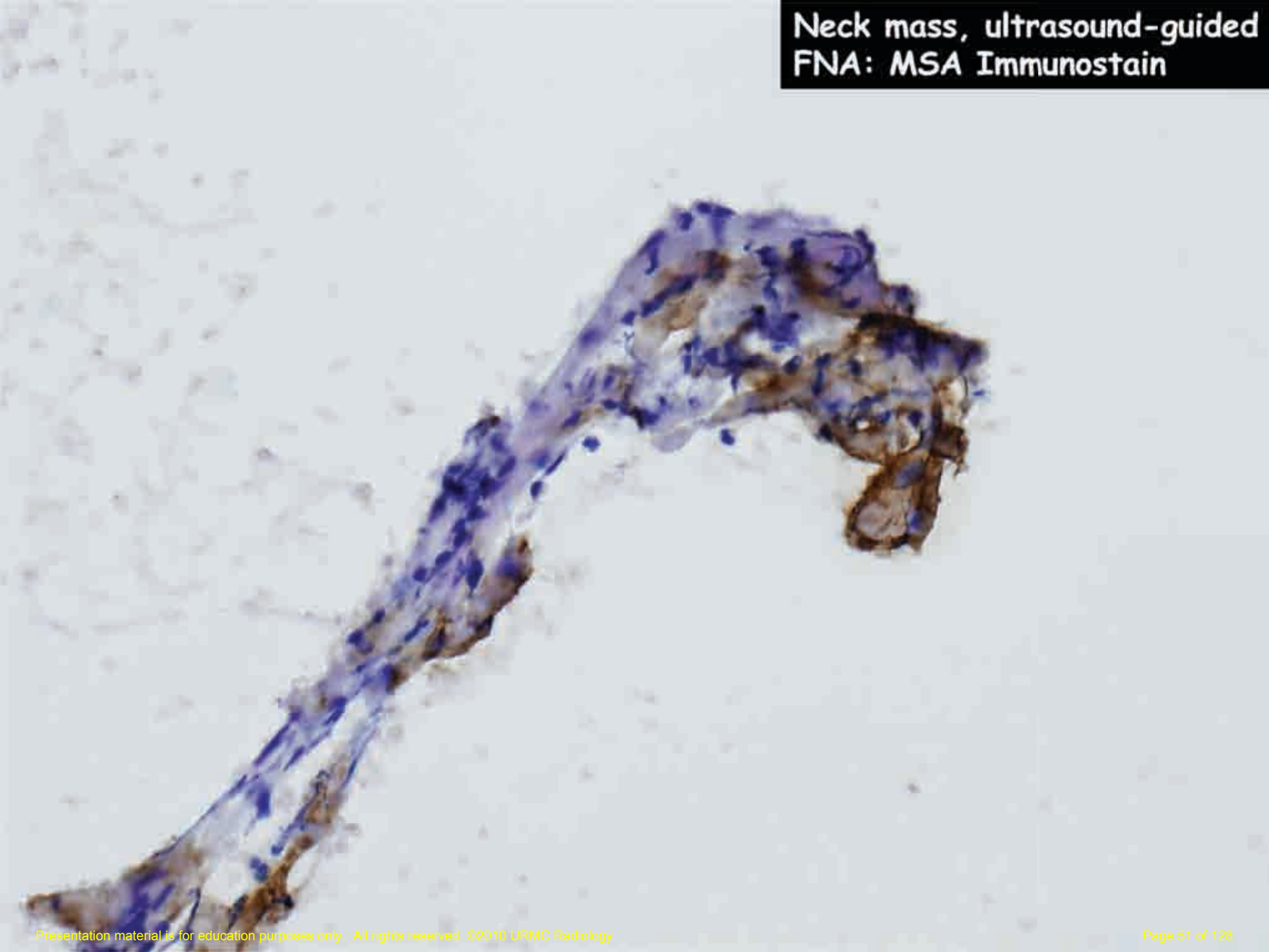
Neck mass, ultrasound-guided
FNA: Papanicolaou stain



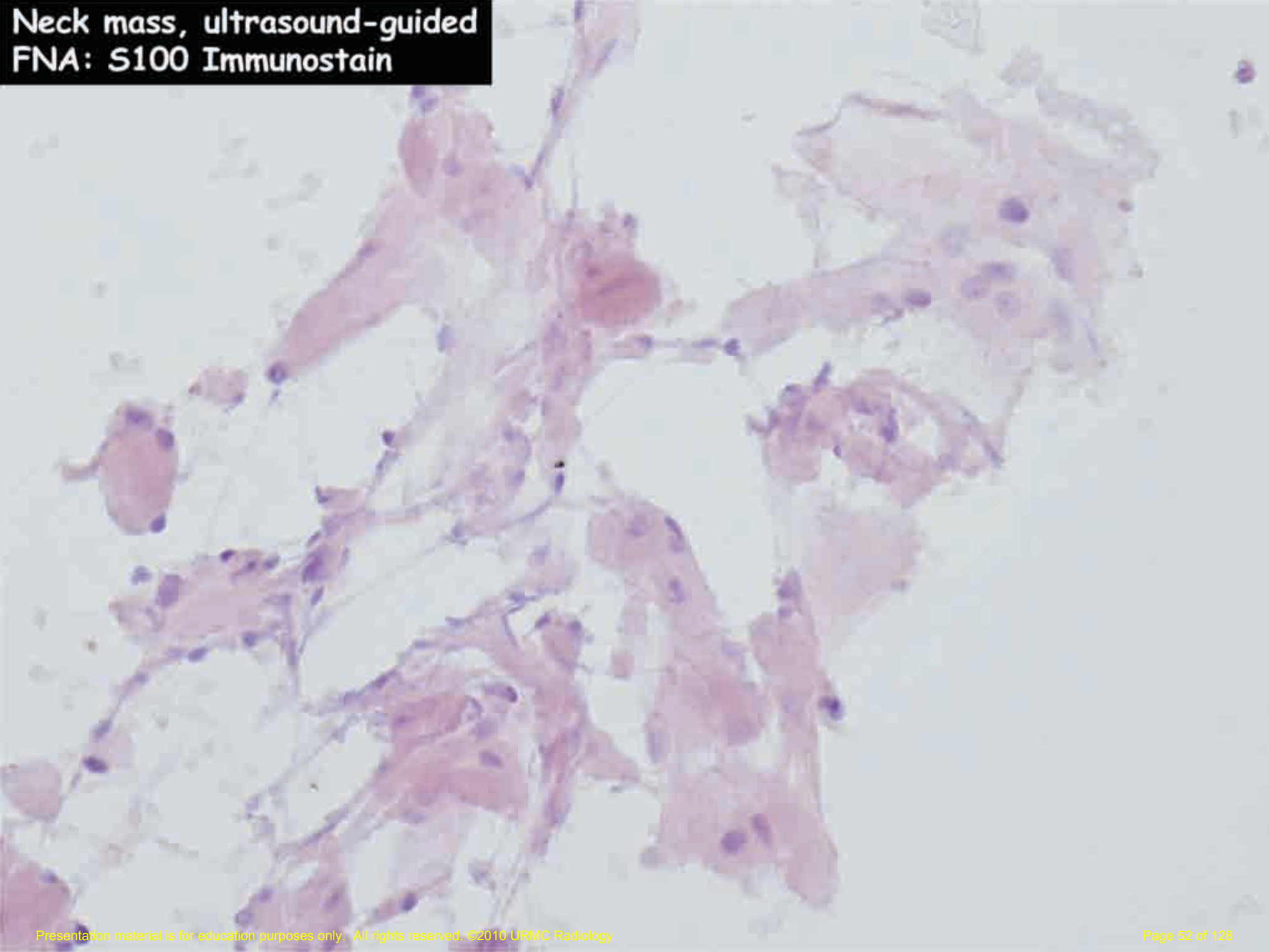
Neck mass, ultrasound-guided FNA: Papanicolaou stain



Neck mass, ultrasound-guided FNA: MSA Immunostain



Neck mass, ultrasound-guided
FNA: S100 Immunostain



Neck mass, ultrasound-guided fine needle aspiration:

Rhabdomyoma, adult type.

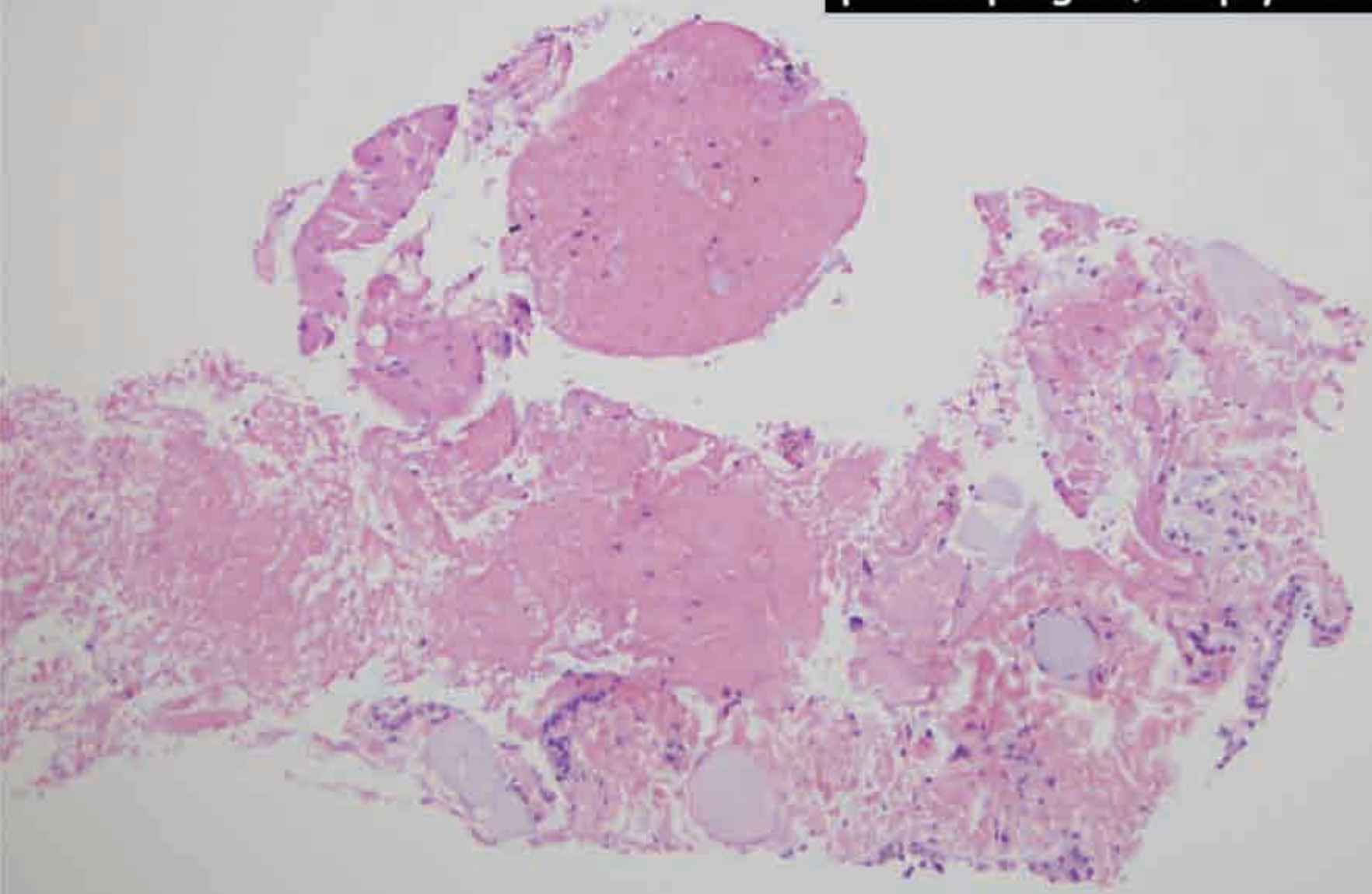
Comment: The tumor consists of polygonal to elongate cells with abundant cytoplasm and round generally centrally located nuclei. Scattered cells display cross striations which are best seen on Diff-Quik stained slides.

Immunohistochemical stains:

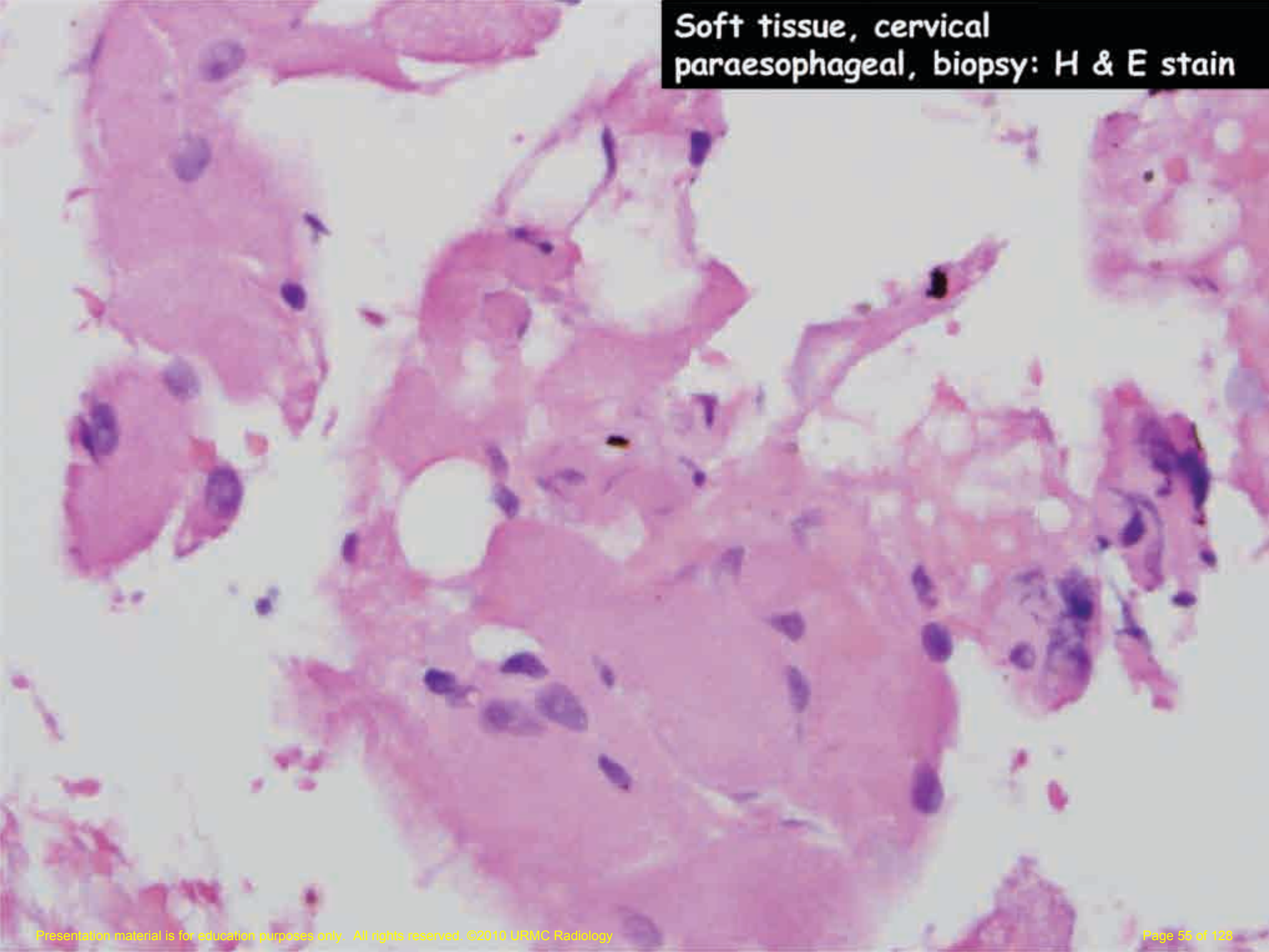
Muscle specific actin (MSA) - positive

S100 - negative

Soft tissue, cervical paraesophageal, biopsy: H & E stain



Soft tissue, cervical paraesophageal, biopsy: H & E stain



Soft tissue, cervical paraesophageal, biopsy:

Fibrofatty tissue with scant benign thyroid epithelium and colloid.

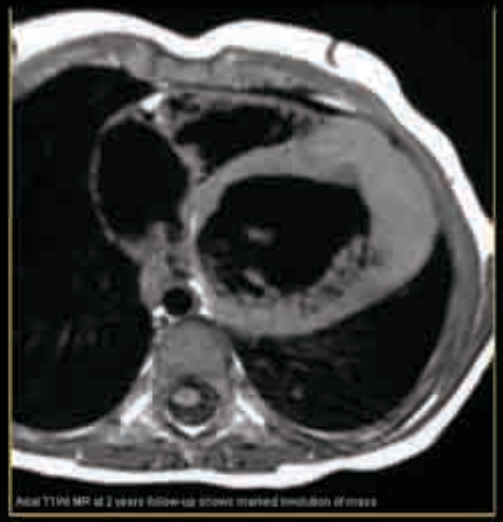
Minute piece of slightly abnormal skeletal muscle.

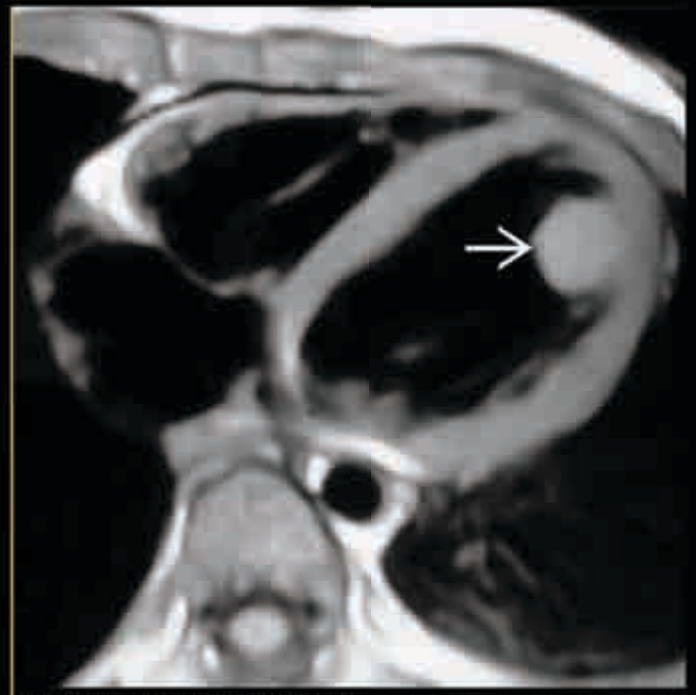
Rhabdomyoma, adult type

- Rare benign tumor of skeletal muscle
- Extracardiac tumors not associated with tuberous sclerosis
- Seen in older adults, 75% male
- Head and neck/oral cavity most common location
- Recurrent potential if incompletely excised

Case 2

- Rhabdomyoma
  - Benign tumor of skeletal muscle (hamartoma)
  - Most common primary cardiac tumor of children
  - Associated with TS in 86%





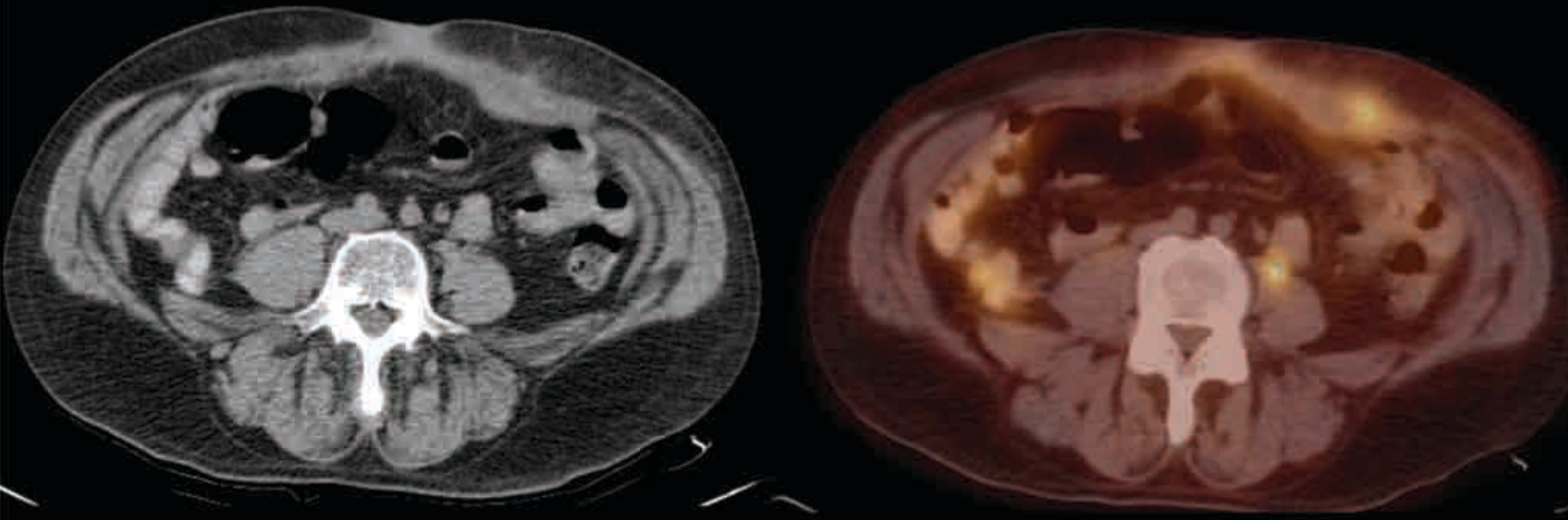
Axial T1Wt MR shows round, well-demarcated intraluminal mass (arrow), originating from the free wall of the left ventricle, slightly hyperintense to myocardium.

Case 2

- Rhabdomyoma
  - Also commonly affects the floor of the mouth/tongue in adults
  - Rhabdomyosarcoma is most common head and neck malignancy in children

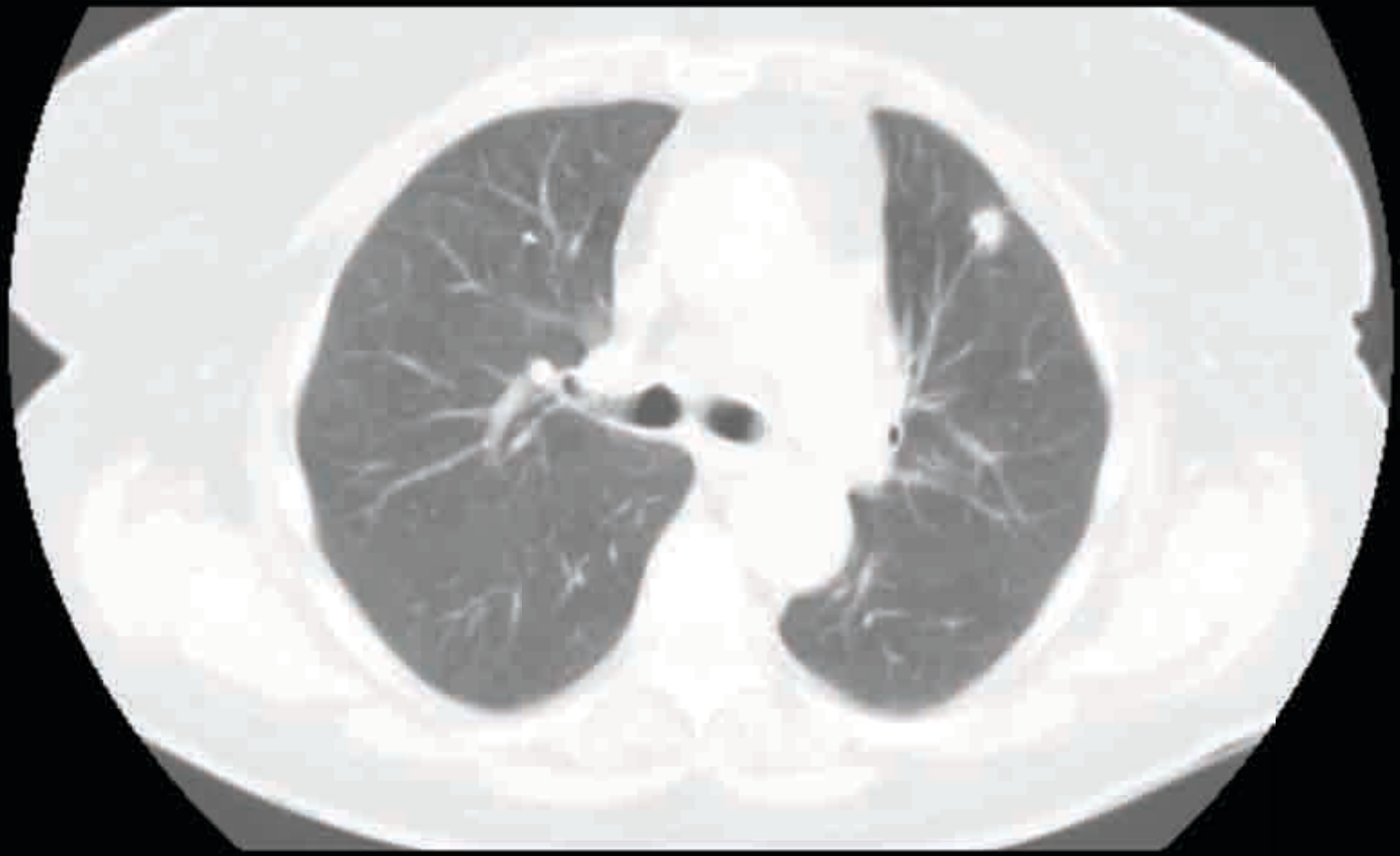
Case 2

- Management?
  - ?Benign esophageal lesion
  - Anterior abdominal wall – malignant?



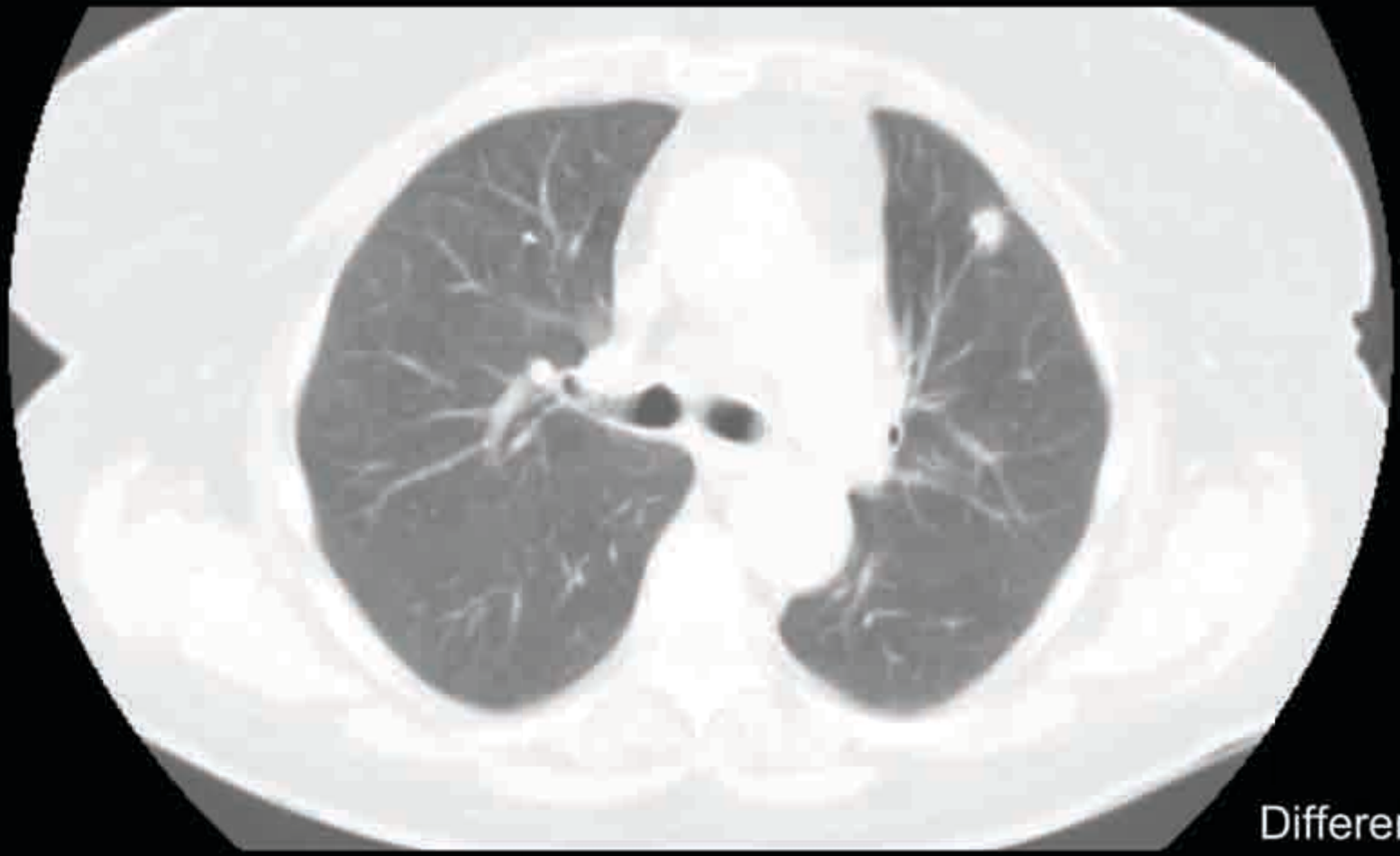
Case 3

- 66 year old female, here to evaluate thoracic aneurysm



Case 3

- 66 year old female, here to evaluate thoracic aneurysm



Case 3

- Solitary pulmonary nodule
  - Granuloma
  - Malignancy/solitary metastasis
  - Infectious
  - Hamartoma

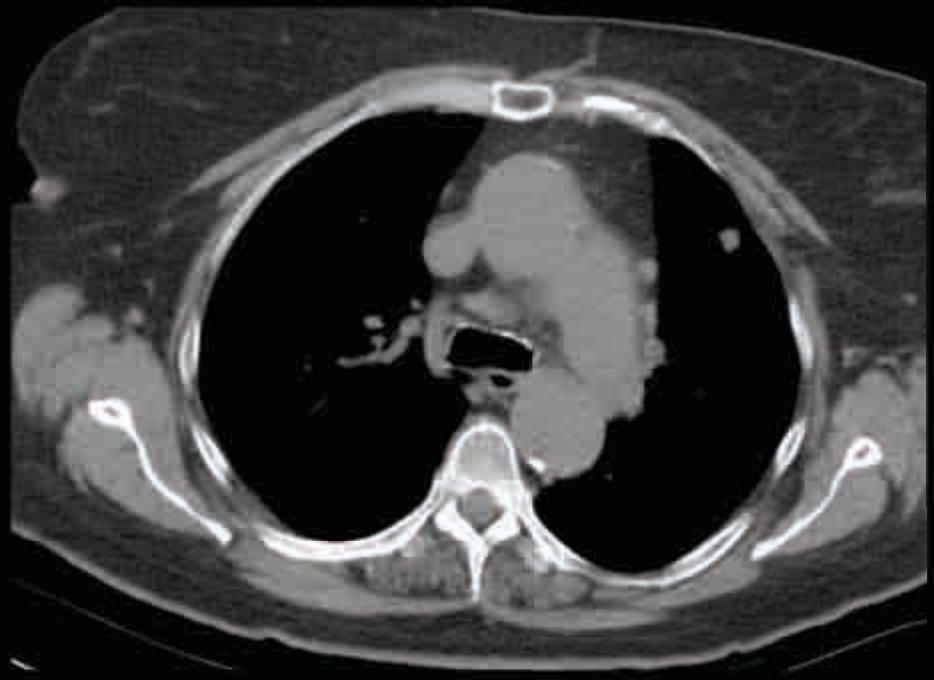
  - Other: collagen vascular dz, sarcoid, Wegener's

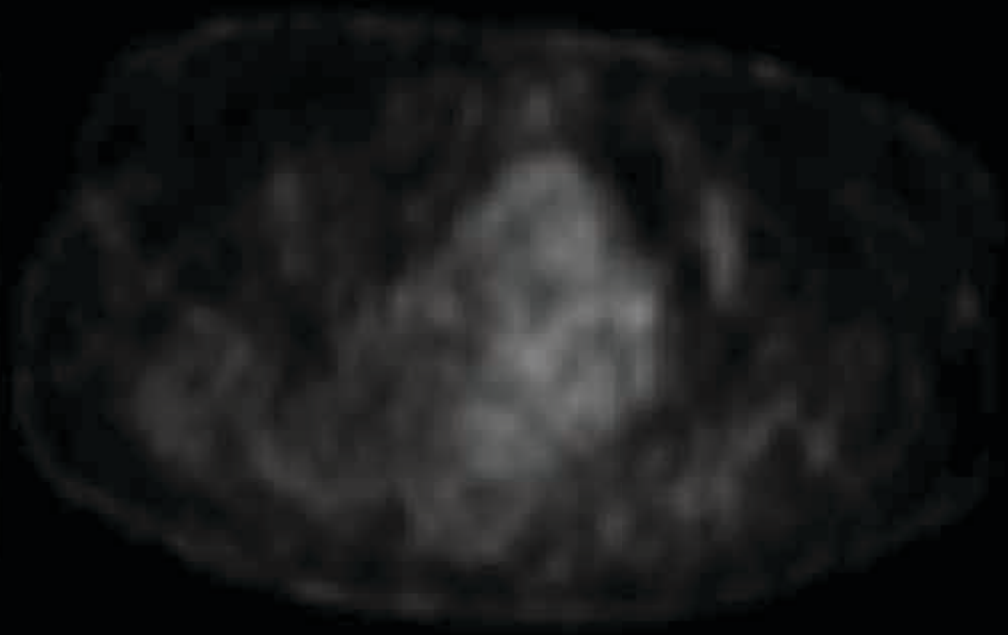
Case 3

- How would you work this up?

Case 3

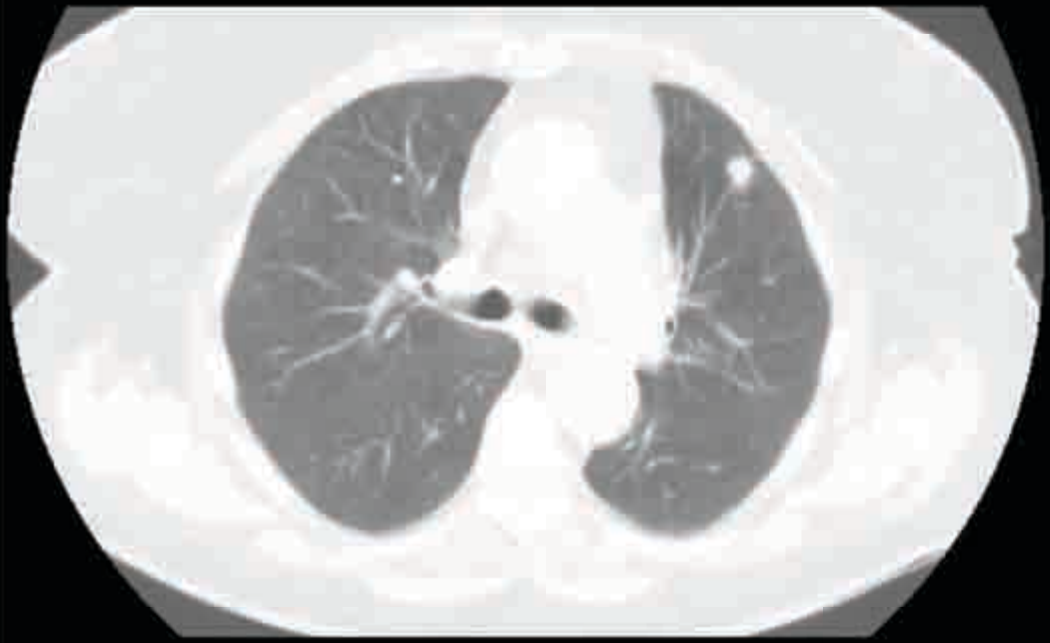
- How would you work this up?





Case 3

- Patient was lost to followup and returns



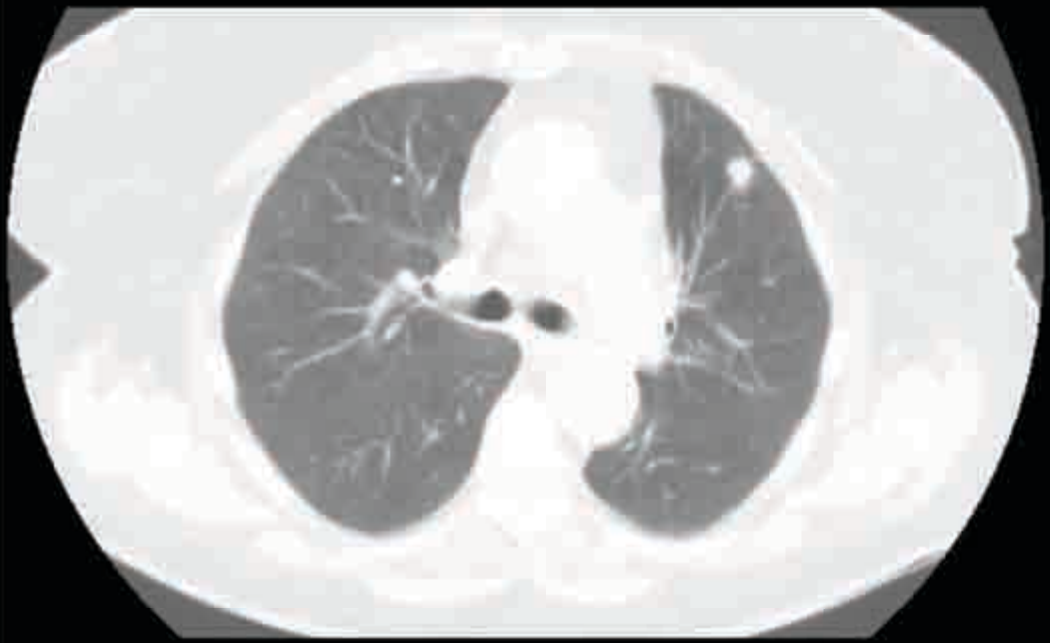
3 yrs ago

What do you expect?

now

Case 3

- Patient was lost to followup and returns

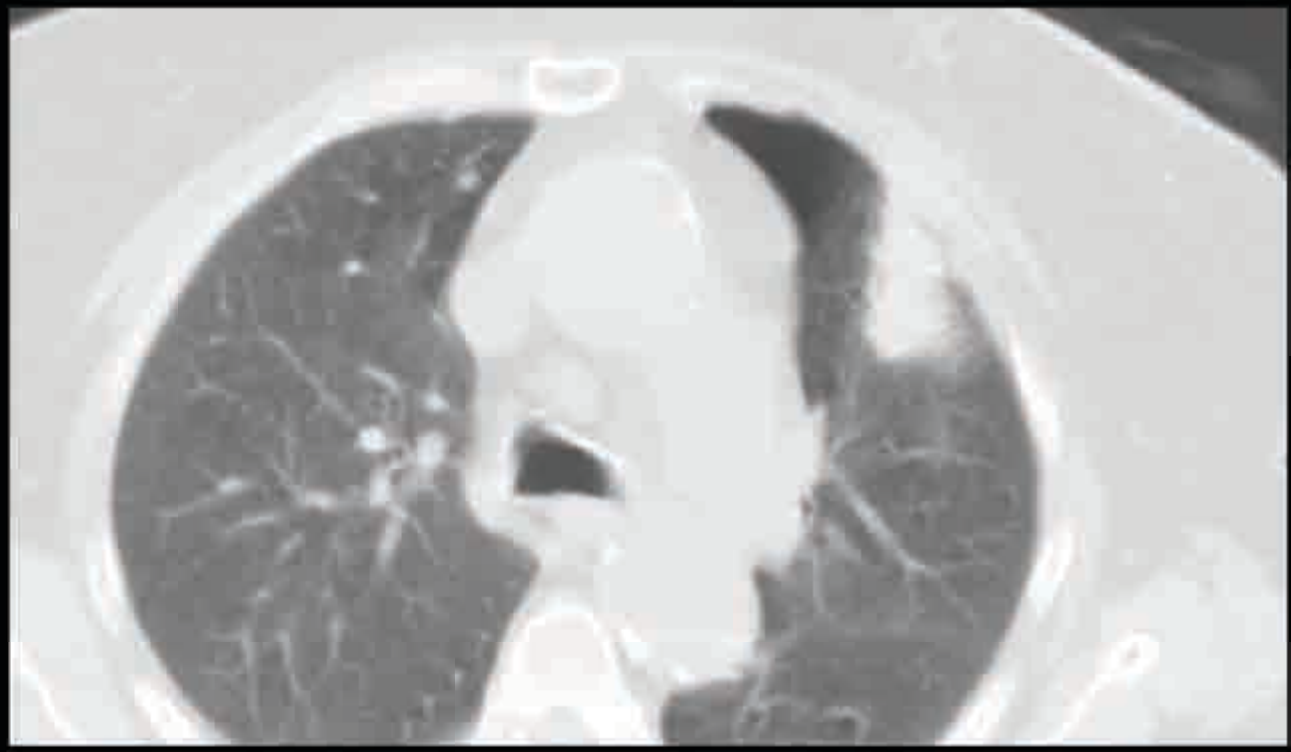


3 yrs ago

now

Case 3

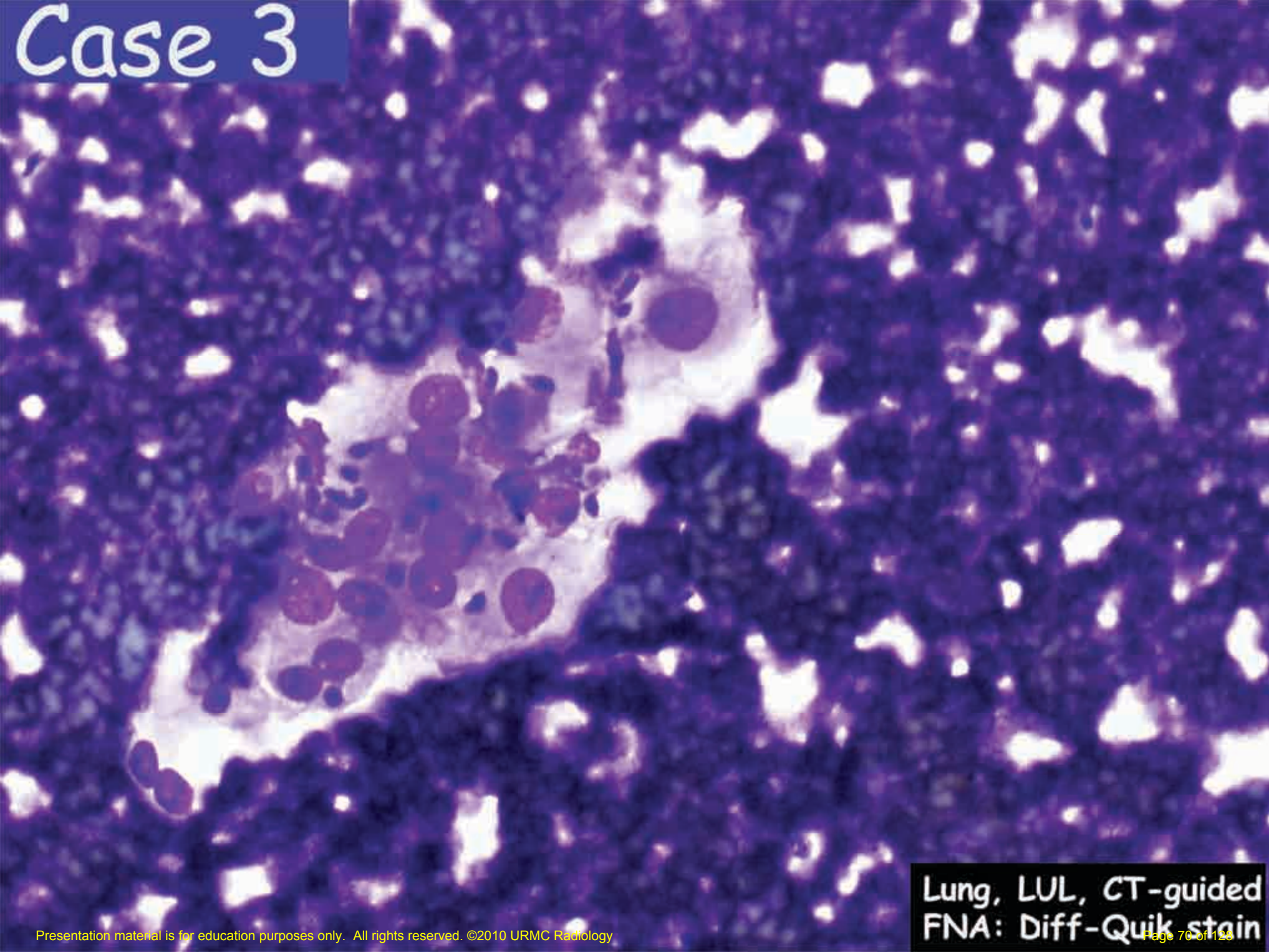
- Post biopsy



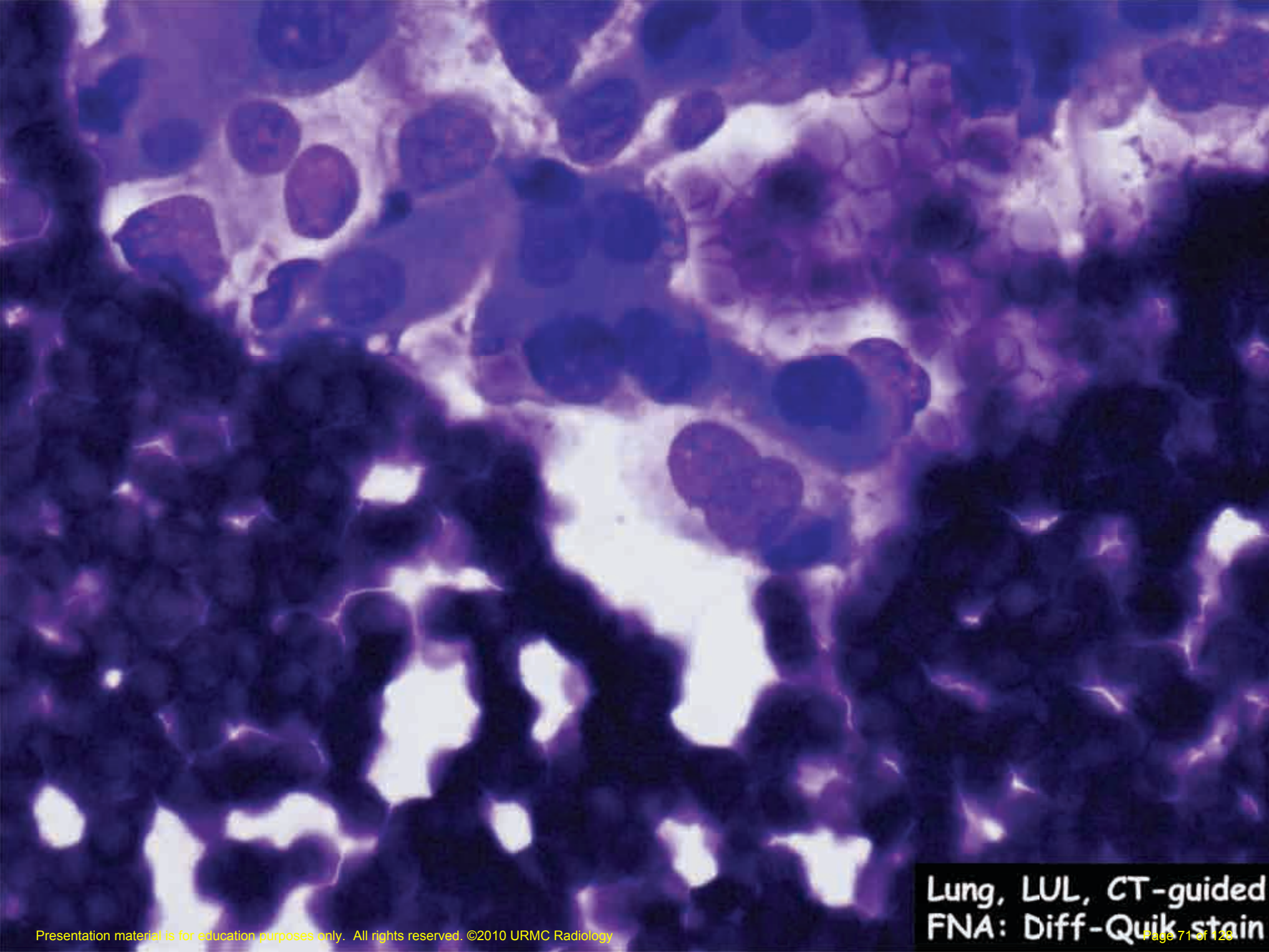
Case 3

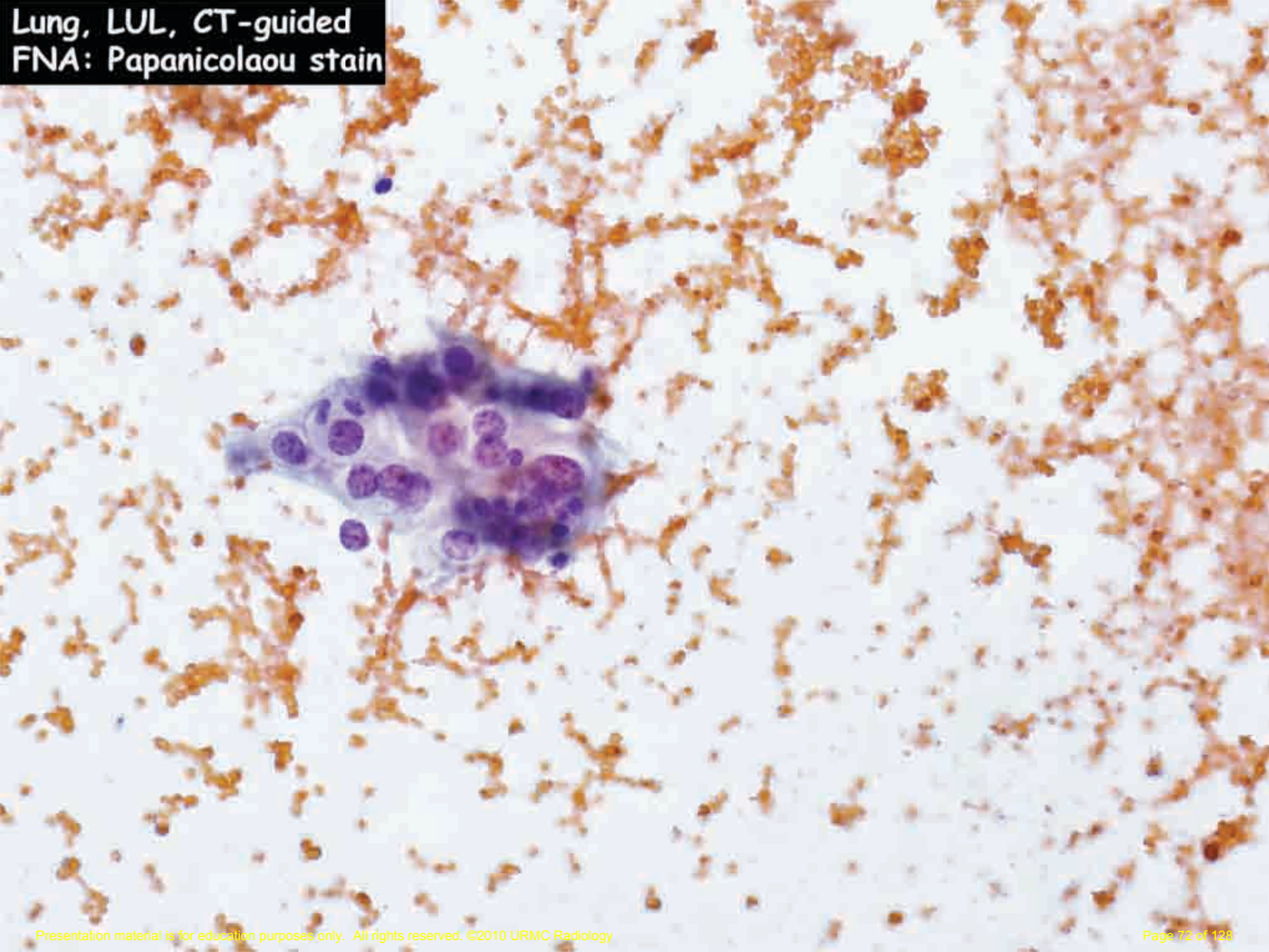
- Case 3 Path

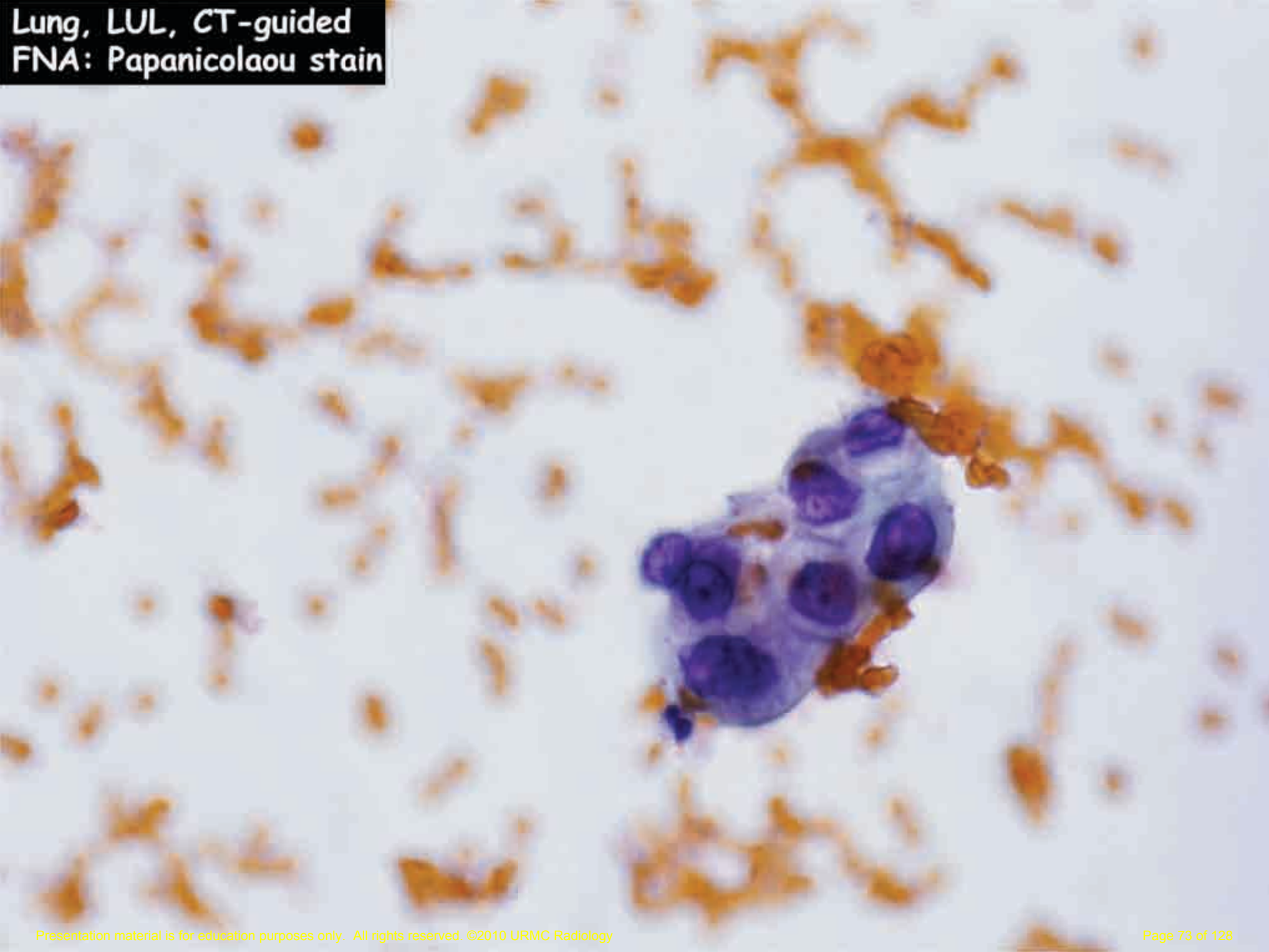
Case 3

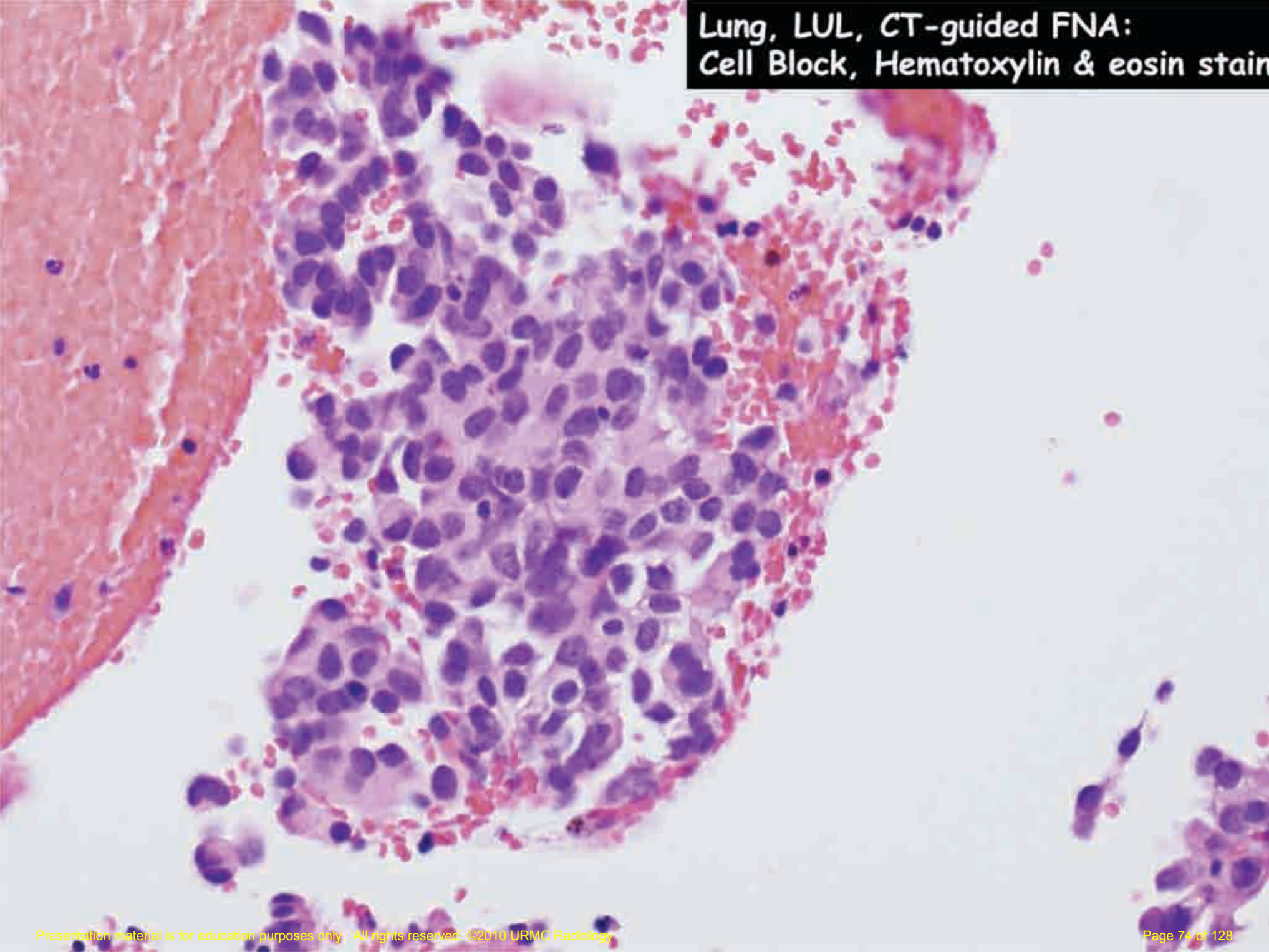


Lung, LUL, CT-guided
FNA: Diff-Quik stain

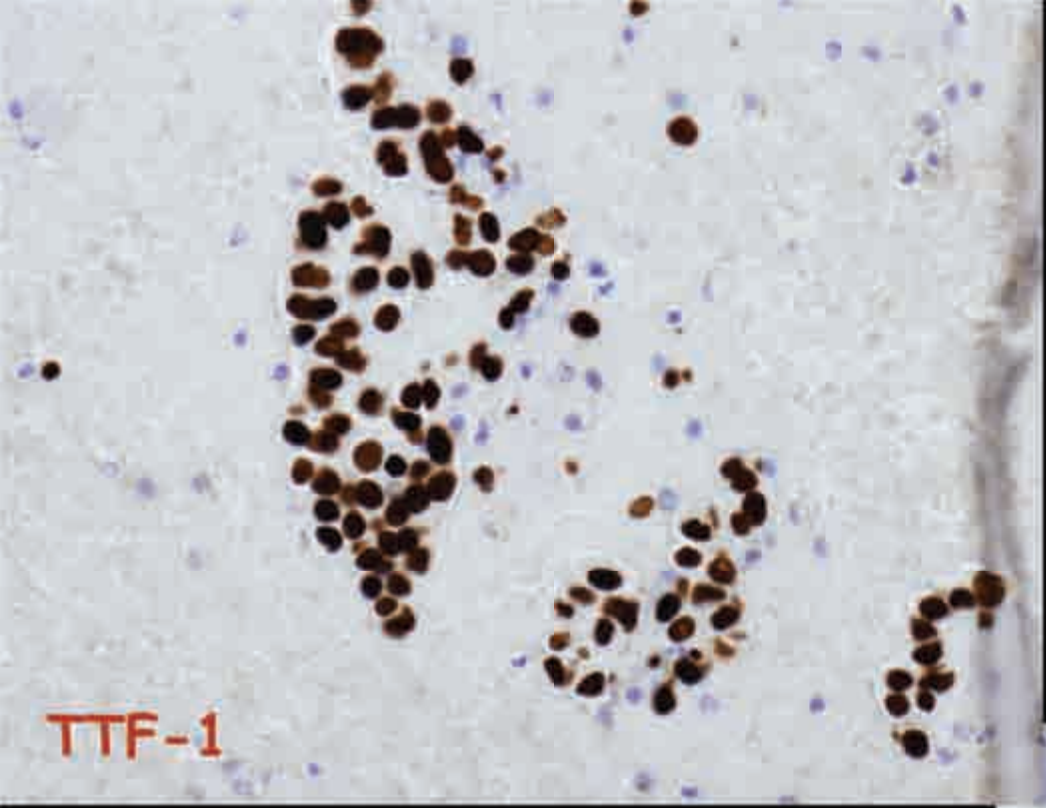


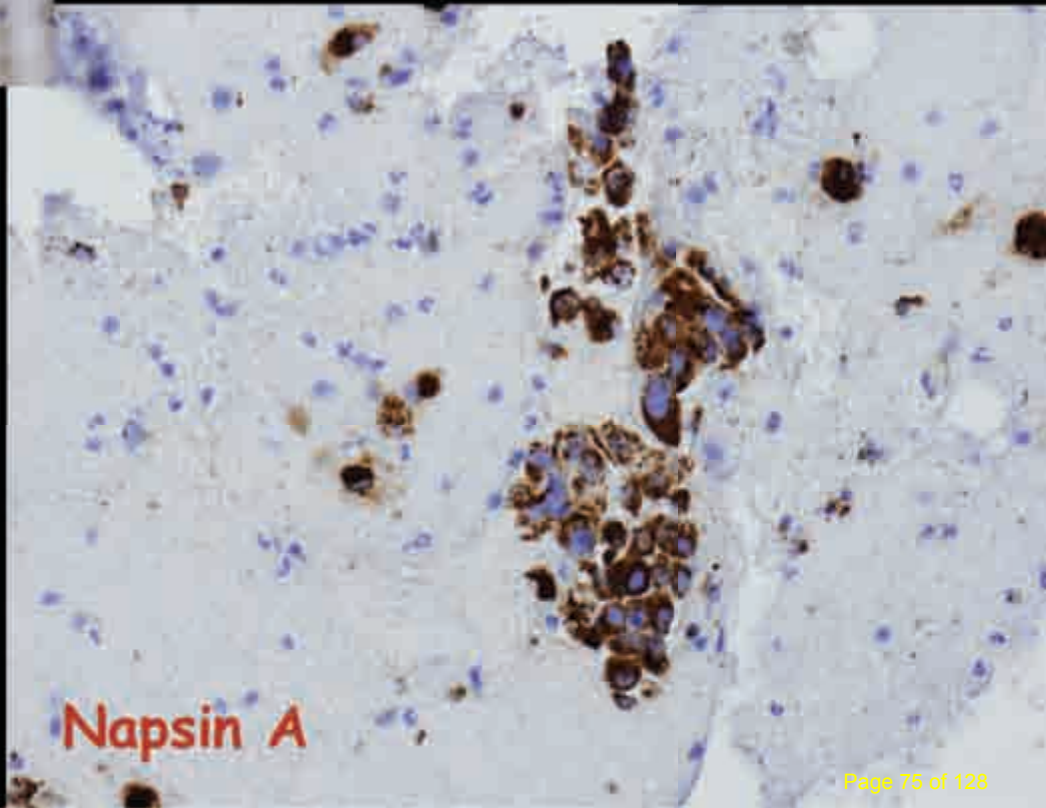






Lung, LUL, CT-guided FNA: Cell Block, Immunohistochemical stains





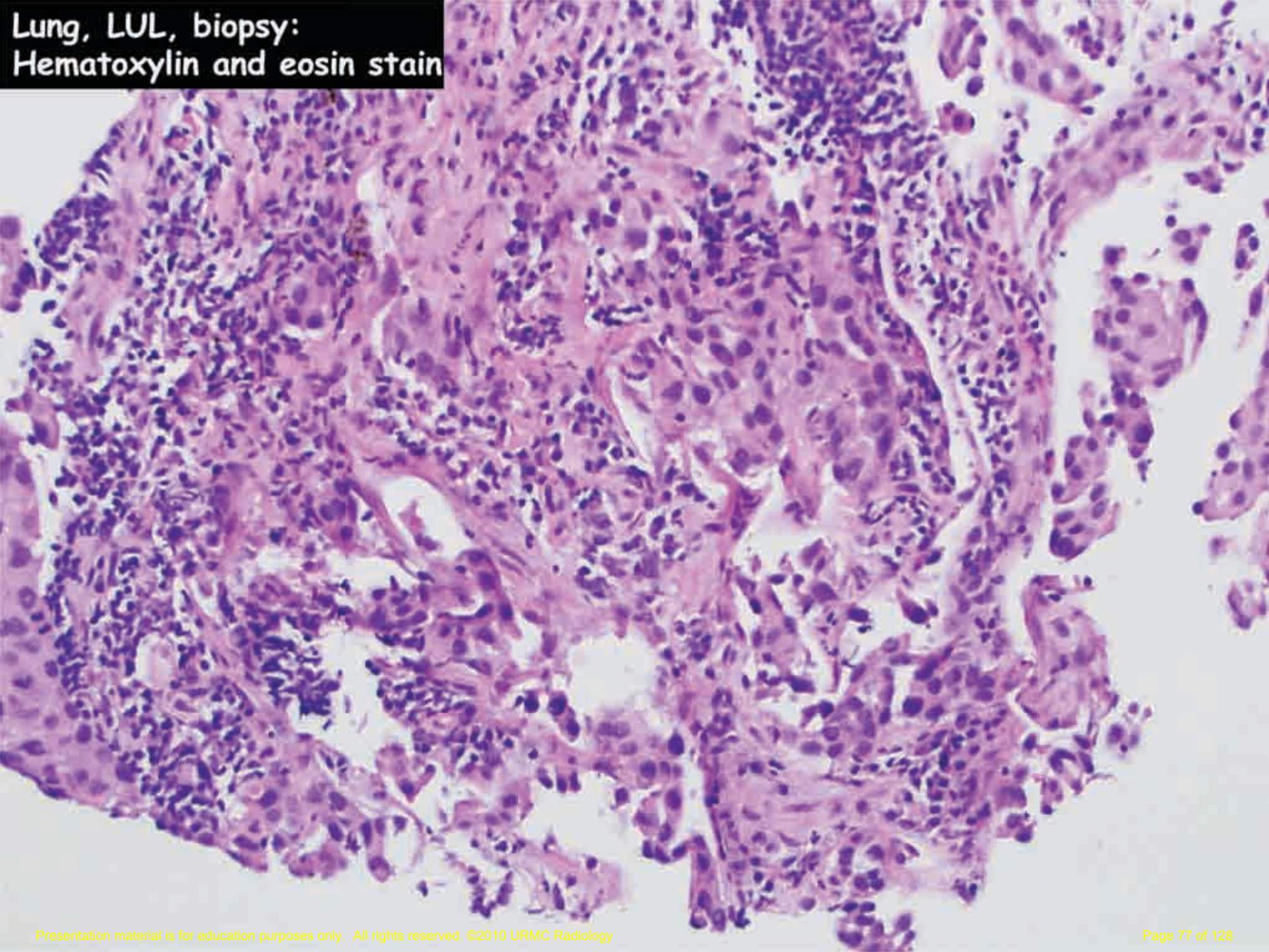
Lung, Left upper lobe, CT-guided fine needle aspiration:

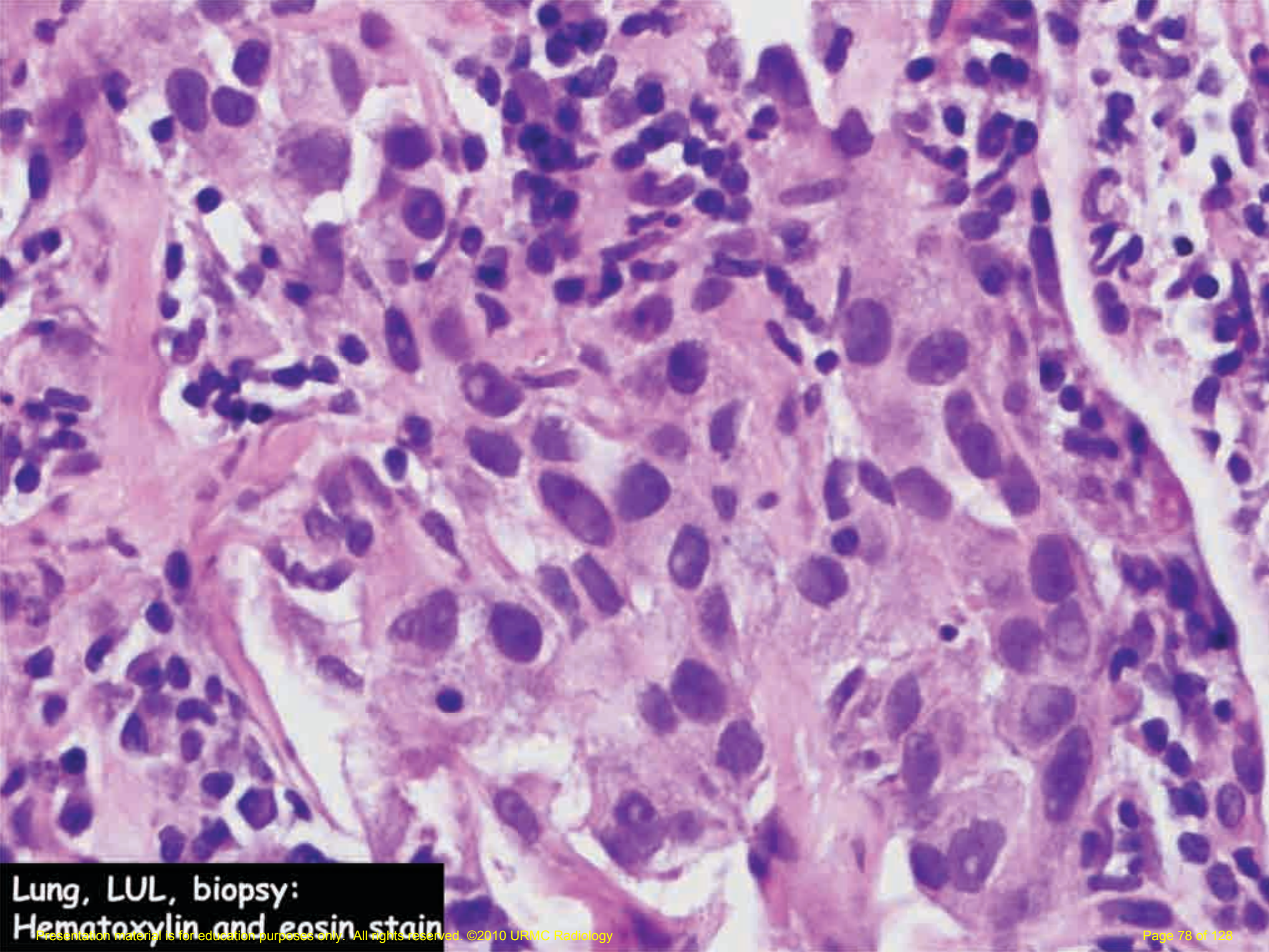
Malignant tumor cells present derived from adenocarcinoma.

Immunohistochemical stains:

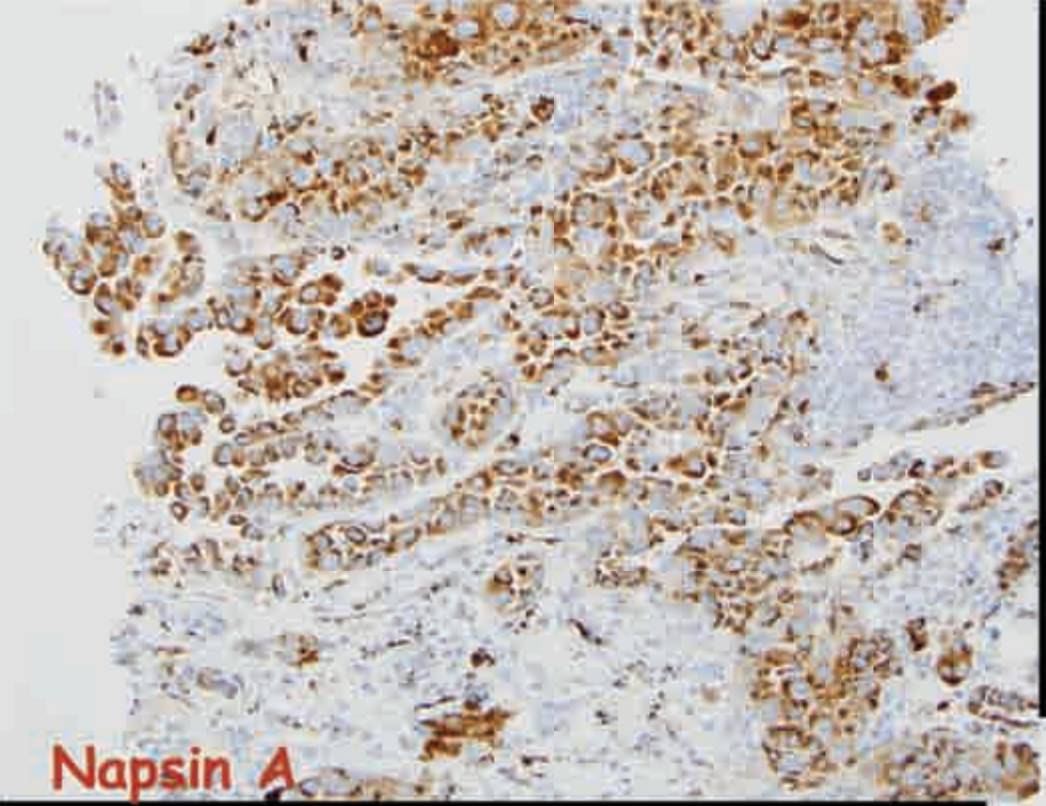
- Positive: TTF-1, Napsin A
- Negative: p63

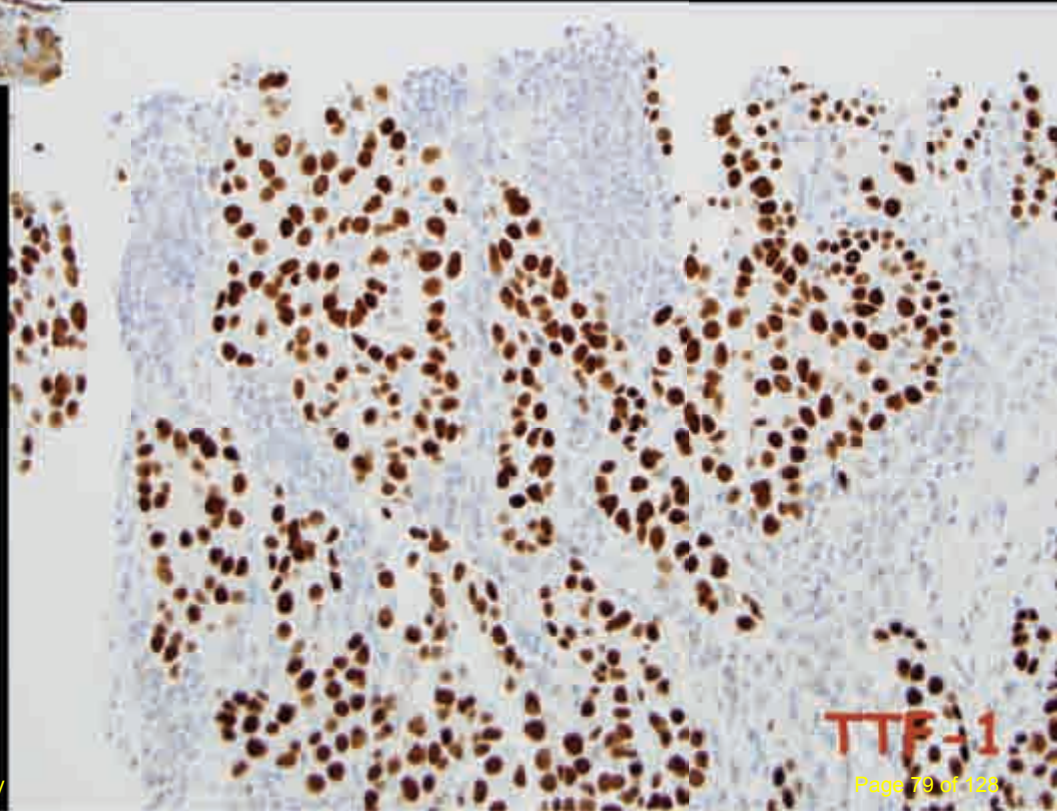
The findings support adenocarcinoma of the lung.





Lung, LUL, biopsy: Immunohistochemical stains





Lung, left upper lobe, biopsy:

Adenocarcinoma consistent with pulmonary primary.

Immunohistochemical stains:

Positive: TTF-1, Napsin A

Negative: p63

The results support the diagnosis and a pulmonary origin.

Pulmonary adenocarcinoma

- Lung cancer is #1 cause of cancer death
- Adenocarcinoma: most common lung carcinoma in females and non-smokers
  - 65% peripheral location
- Positive immunostaining for CK7, TTF-1, Napsin A, and negative for CK20
- Positive intracellular histochemical staining for mucin

- Broad classification is non-small cell carcinoma (80%) versus small cell carcinoma (20%)
- Overall 5 year survival in general: 10-15%
- 50% of non-small cell carcinomas are metastatic at diagnosis vs. 80% of small cell carcinomas
  - Hilar, mediastinal, supraclavicular lymph nodes most common
  - Also adrenal, liver, brain, bone, opposite lung, pericardium, kidney

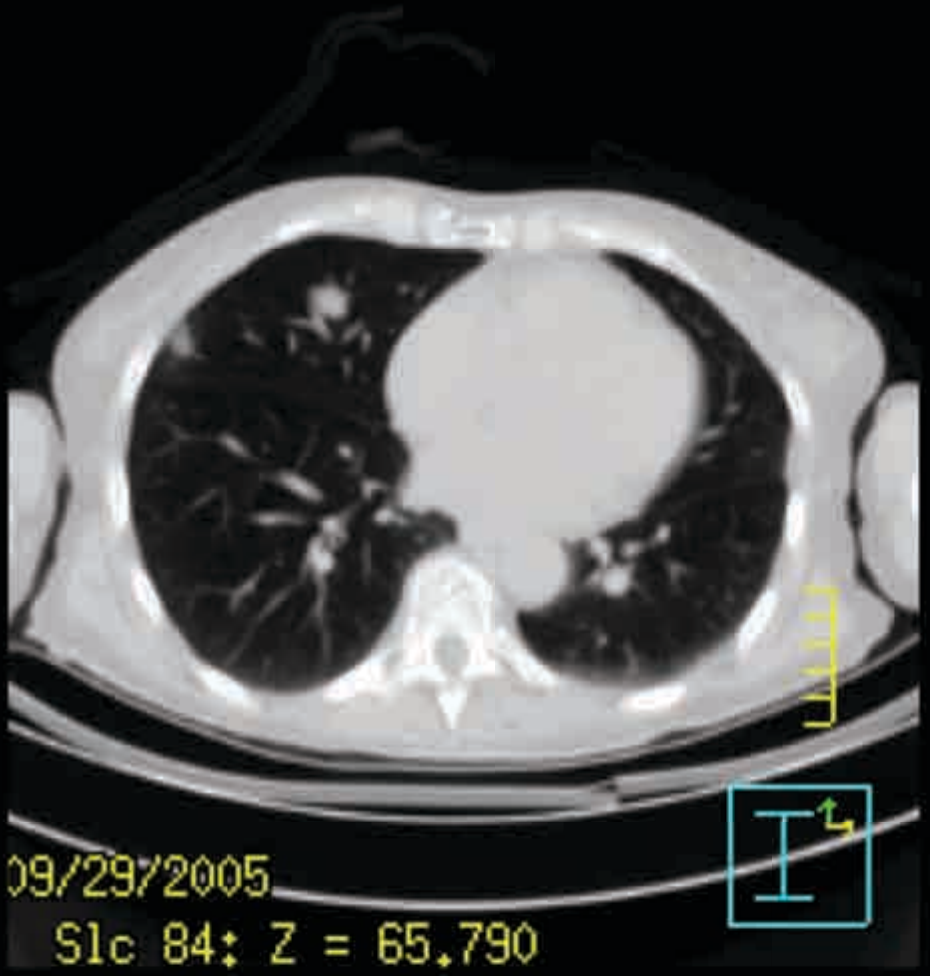
Case 3

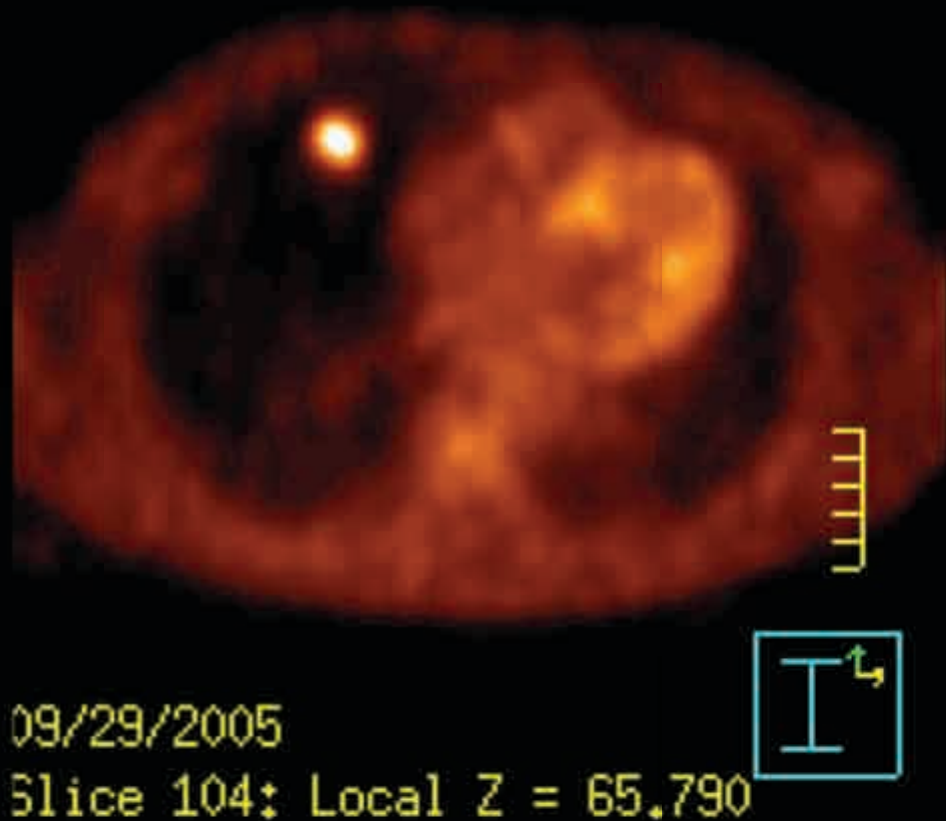
- Lung cancer
  - Small cell
  - Non-small cell
    - Adenocarcinoma
      - BAC subtype
    - Squamous cell
    - Large cell

Case 3

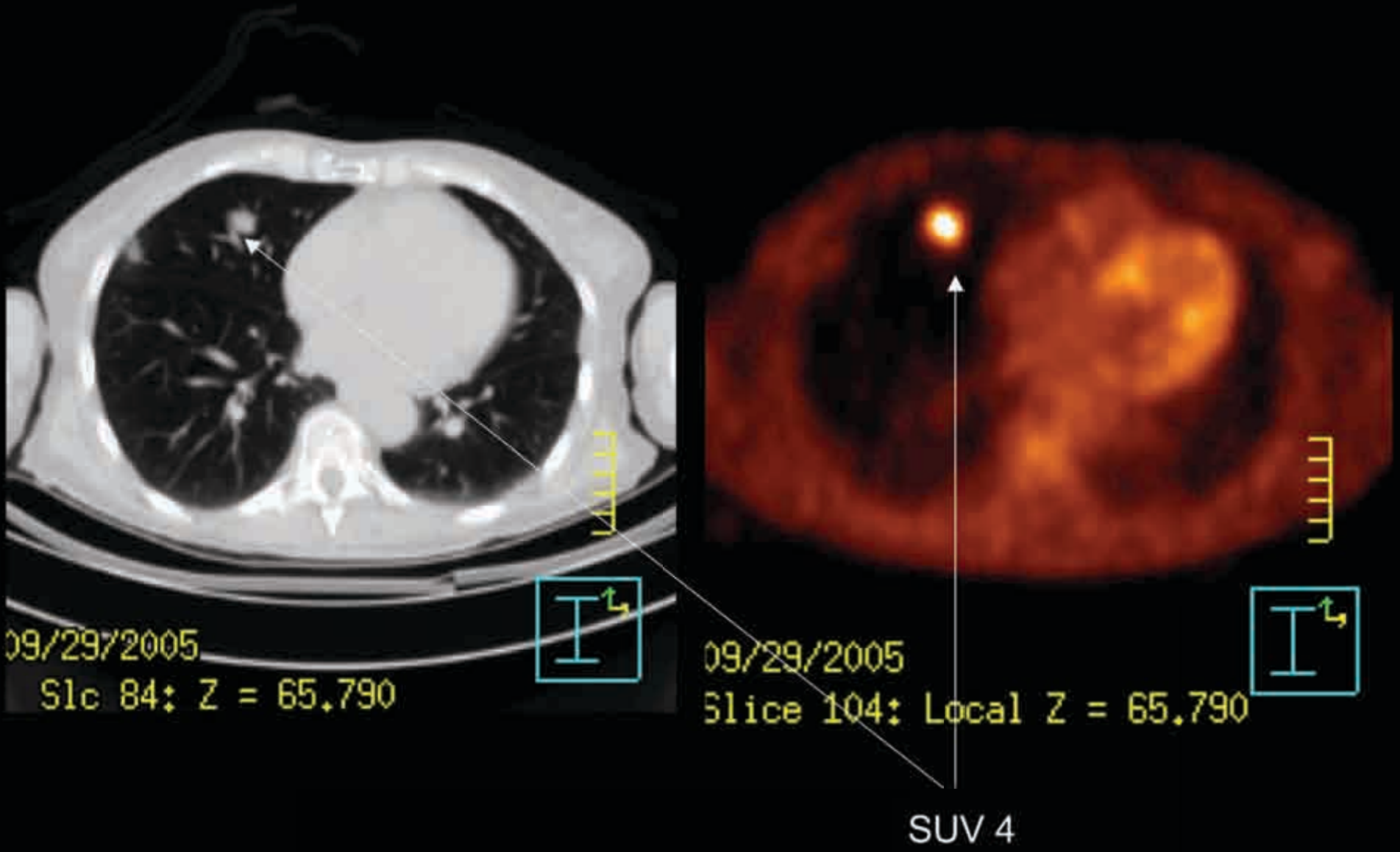
- Key points
  - PET-CT is not optimal for places where there is
    - Motion (breath hold and cardiac gating)
    - Small size (<2 cm)
    - Hypometabolic tumor (BAC, carcinoid 1/3)
  - Suspicious FDG-PET findings should be biopsied without following for growth on CT
  - Suspicious CT morphology should be biopsied with negative PET

PET-CT vs size

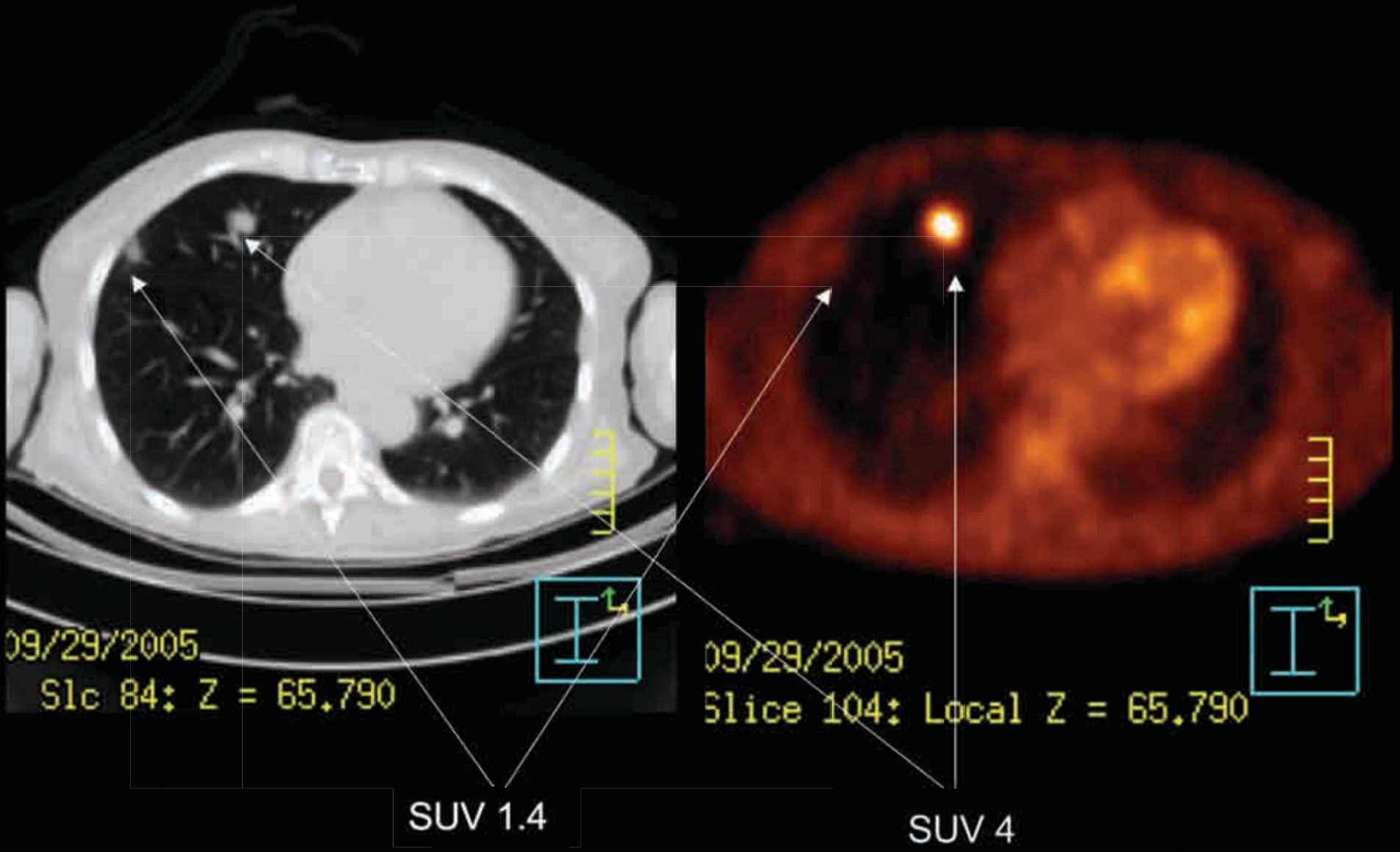




PET-CT vs size

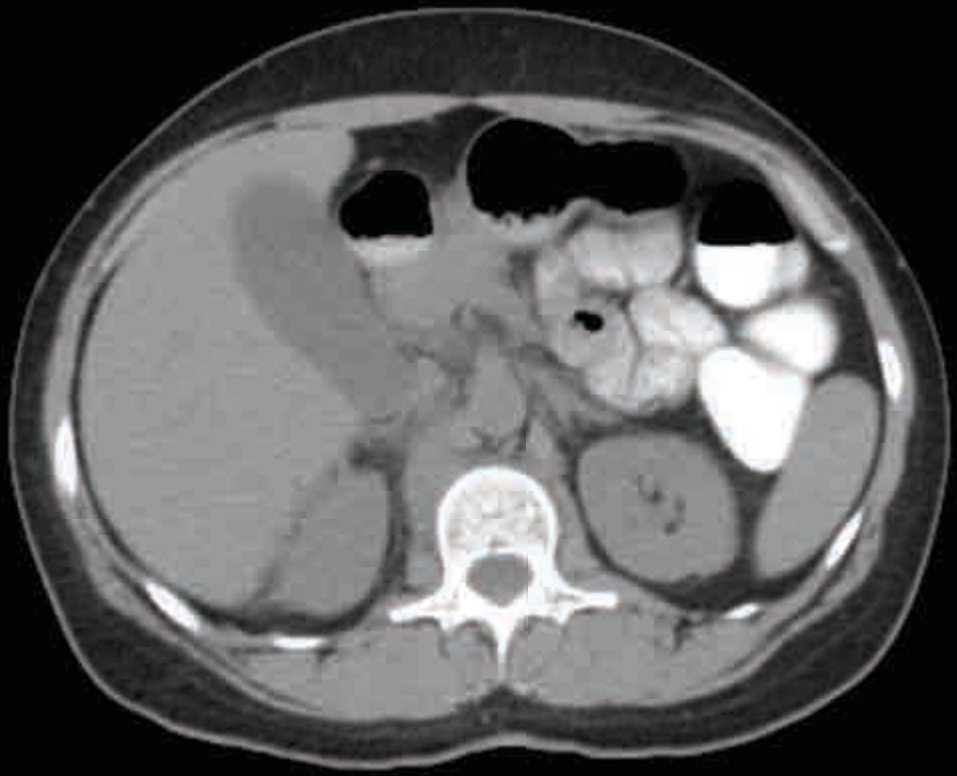


PET-CT vs size



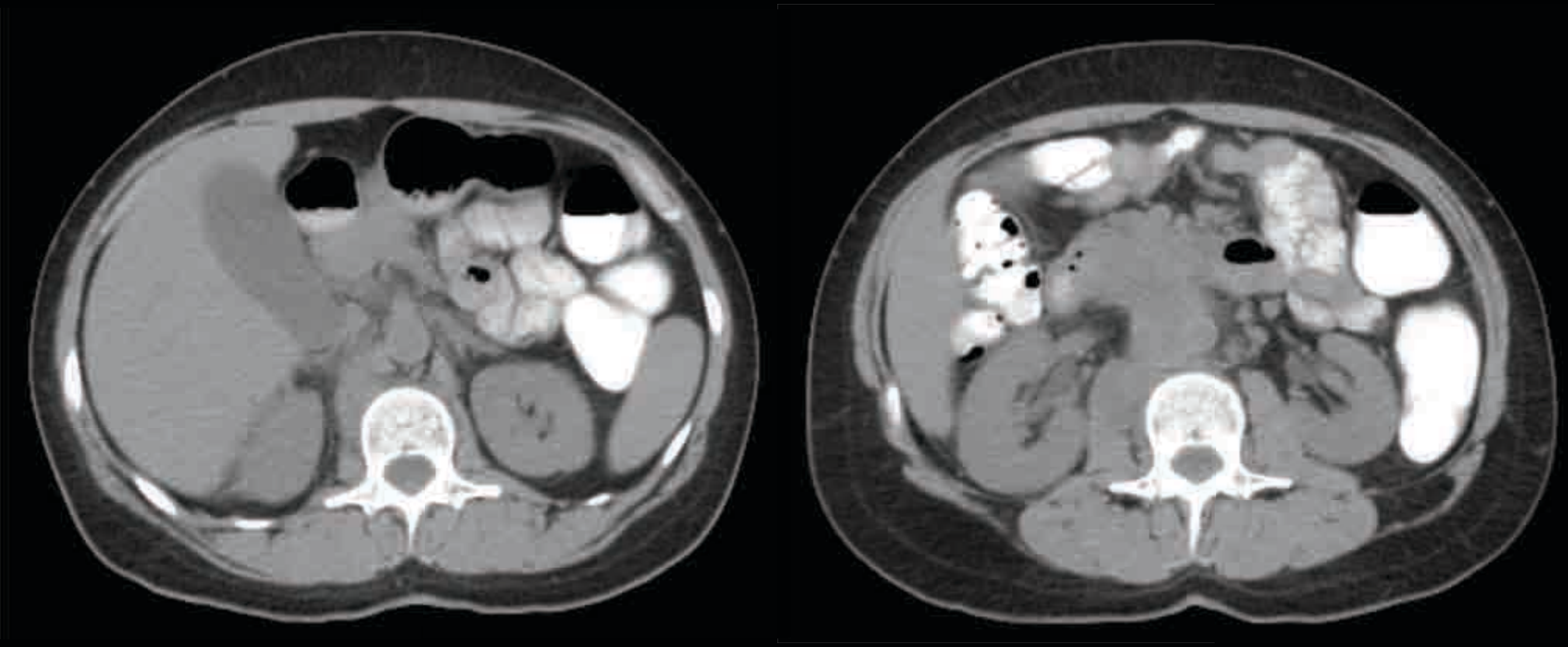
Case 4

- 38 year old female, history withheld

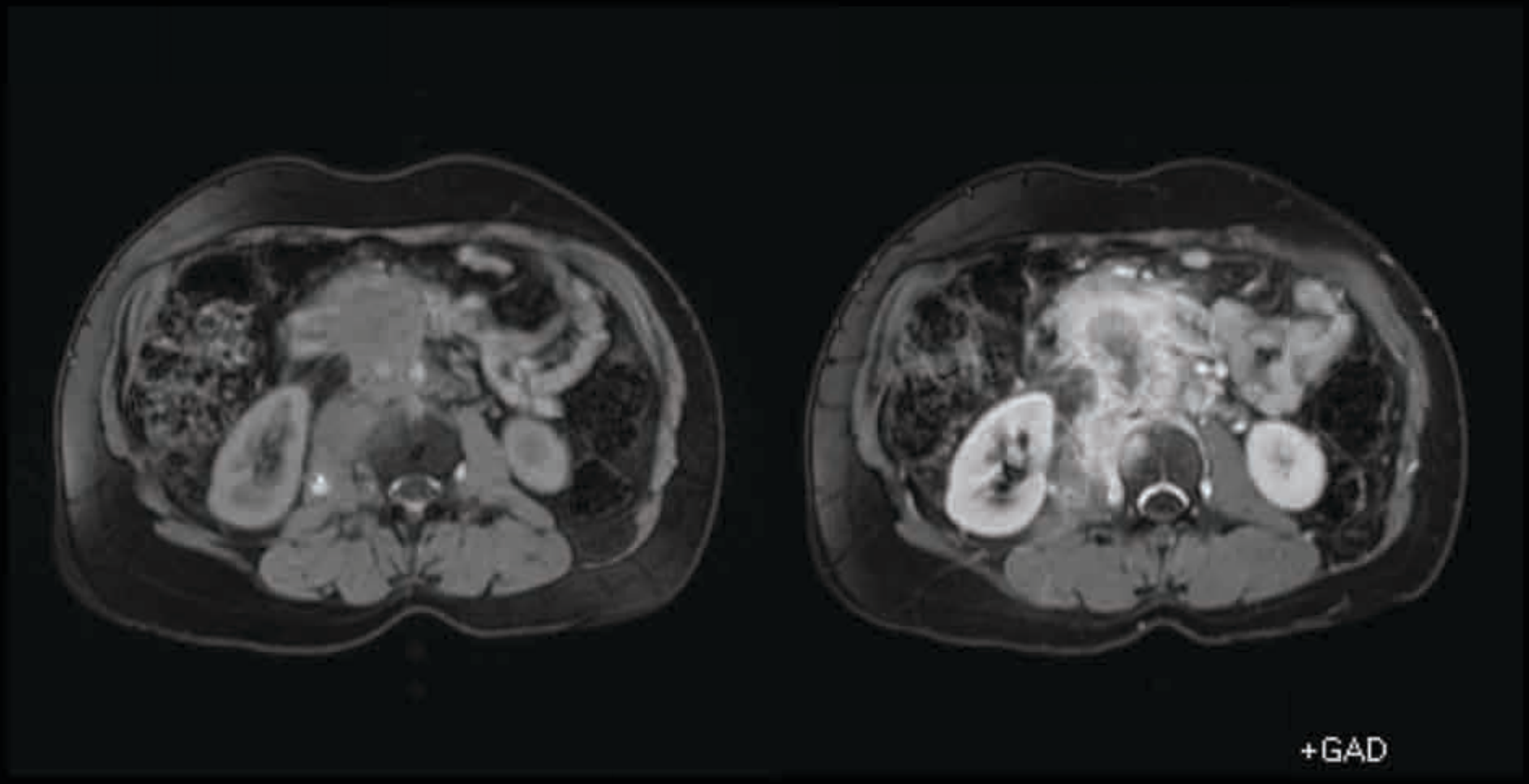


Case 4

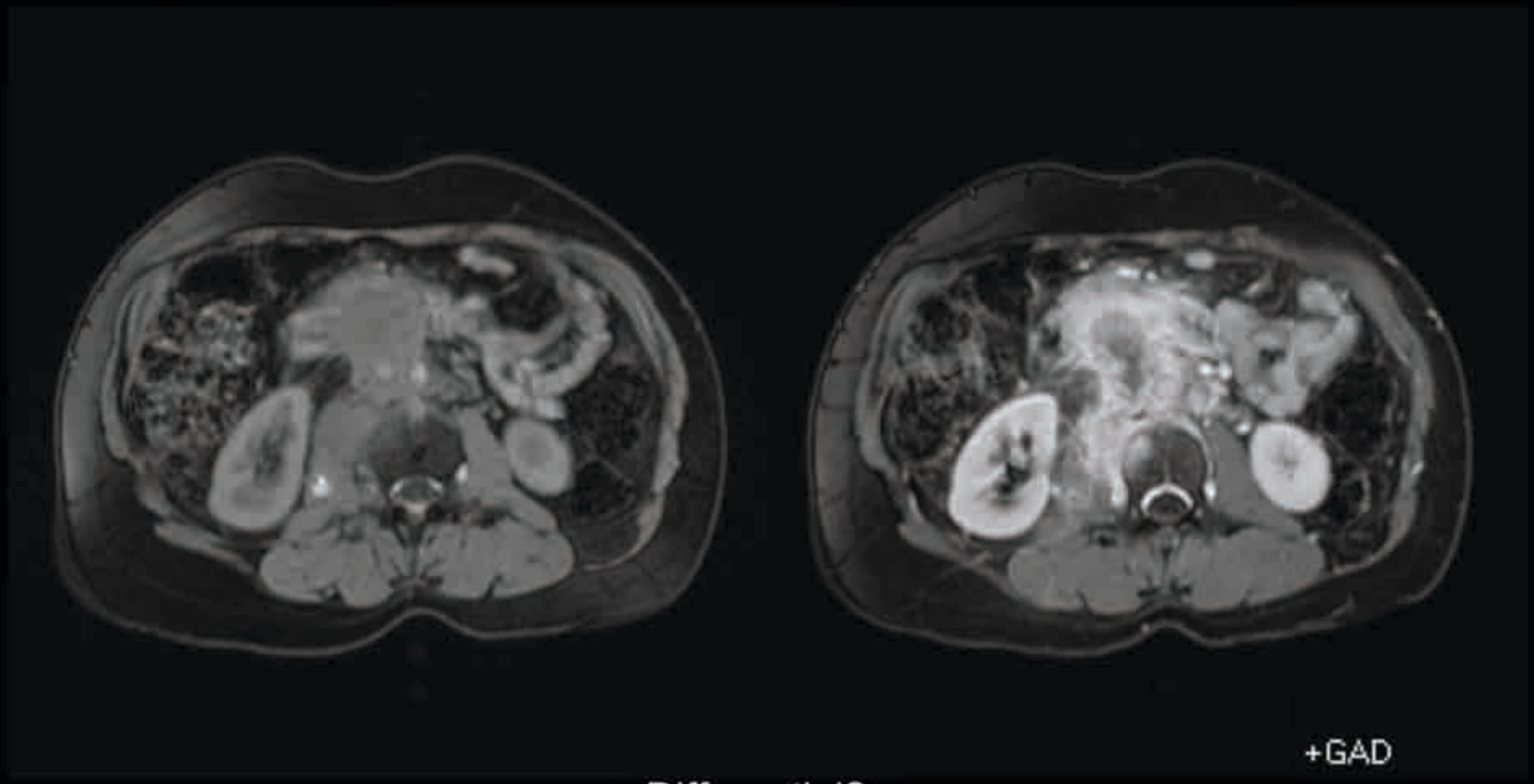
- 38 year old female, history withheld



Case 4



Case 4



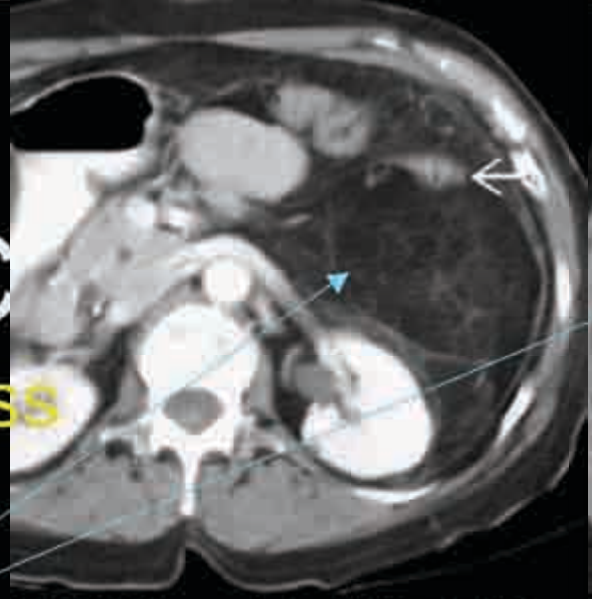
Differential?

Case 4

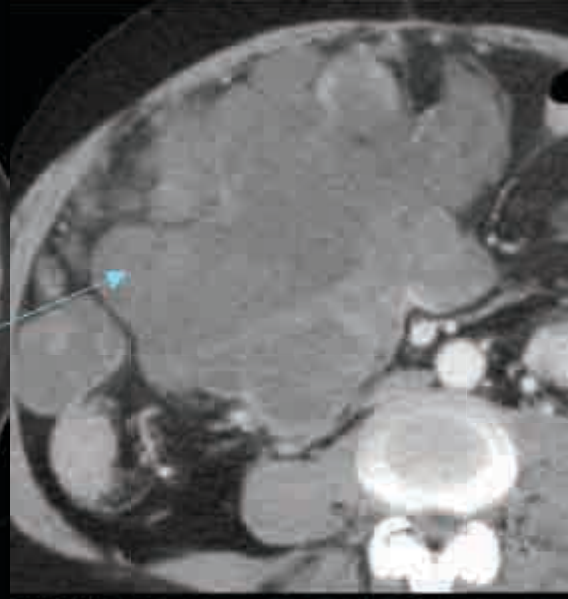
- Retroperitoneal mass
  - Primary tumors:
    - Fibrosarcoma/MFH
    - Liposarcoma
    - Leiomyosarcoma
  - Metastatic disease
  - Lymphoma
  - Retroperitoneal fibrosis
  - Infection – TB, AIDS, aortitis

C

- Retroperitoneal mass
  - Primary tumors:
    - Fibrosarcoma/MFH
    - Liposarcoma
    - Leiomyosarcoma
  - Metastatic disease
  - Lymphoma
  - Retroperitoneal fibrosis
  - Infection – TB, AIDS, aortitis



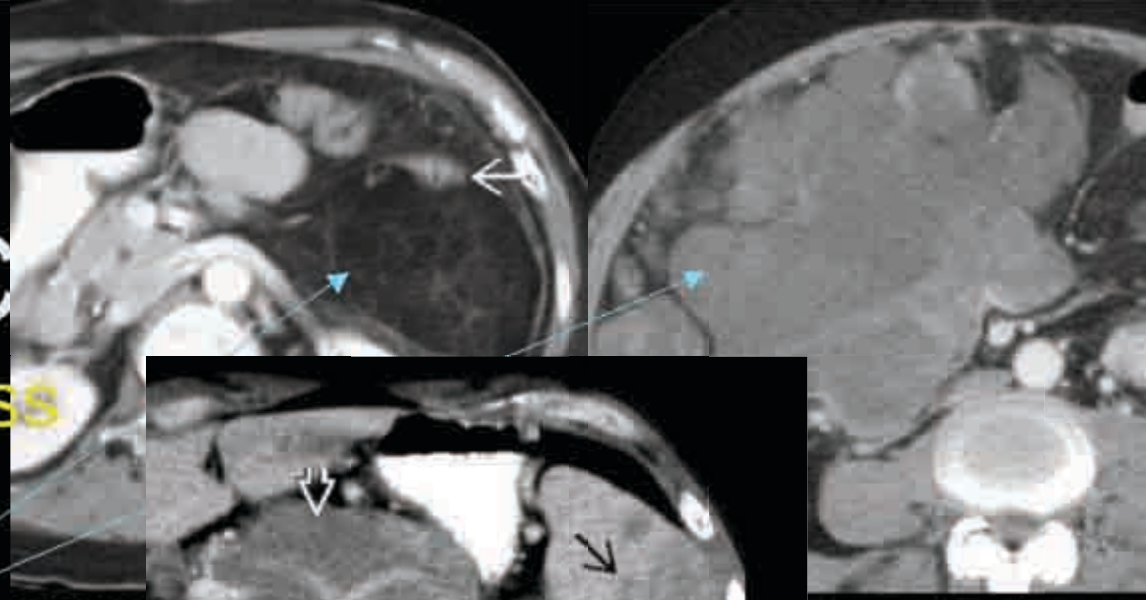
Axial CECT shows predominantly fatty mass that displaces bowel, including descending colon (arrow); liposarcoma.



xial CECT shows liposarcoma arising in the esentery, which bridges the intraperitoneal and etroperitoneal spaces.

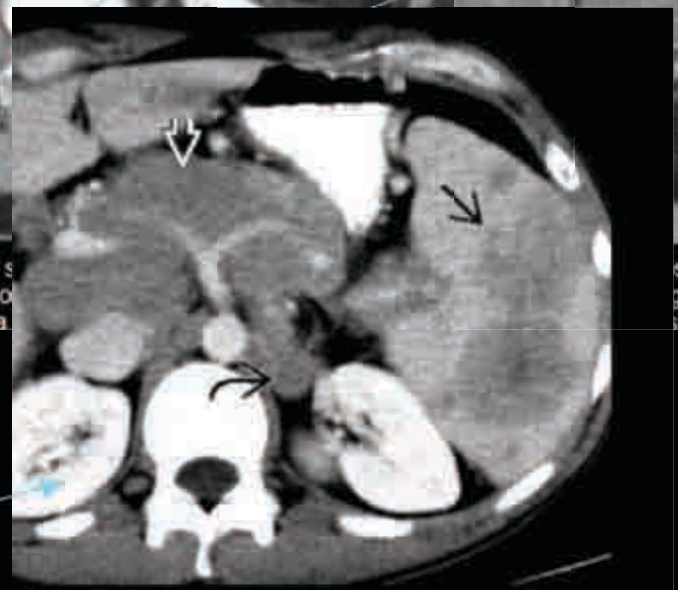
C

- Retroperitoneal mass
  - Primary tumors:
    - Fibrosarcoma/MFH
    - Liposarcoma
    - Leiomyosarcoma
  - Metastatic disease
  - Lymphoma
  - Retroperitoneal fibrosis
  - Infection – TB, AIDS, aortitis



Axial CECT s
displaces bo
liposarcoma

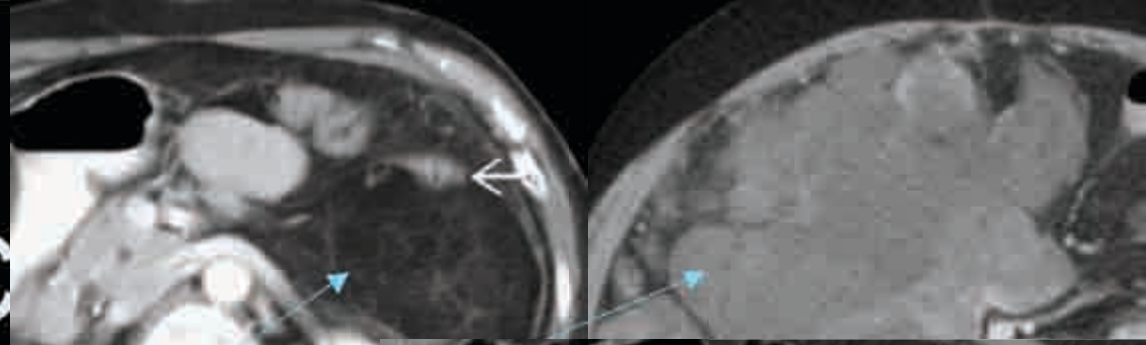
sarcoma arising in the
ges the intraperitoneal and



Axial CECT with splenic and nodal involvement from Hodgkin disease. Note multiple low-density lesions (arrow) with celiac (open arrow) and retroperitoneal (curved arrow) involvement.

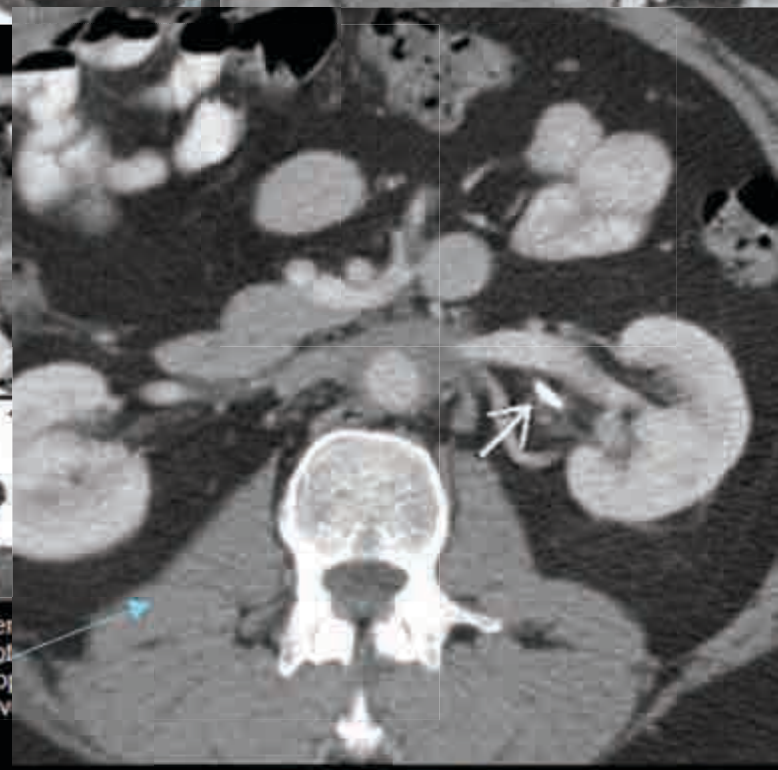
C

- Retroperitoneal mass
  - Primary tumors:
    - Fibrosarcoma/MFH
    - Liposarcoma
    - Leiomyosarcoma
  - Metastatic disease
  - Lymphoma
  - Retroperitoneal fibrosis
  - Infection – TB, AIDS, aortitis



Axial CECT s
displaces bo
liposarcoma

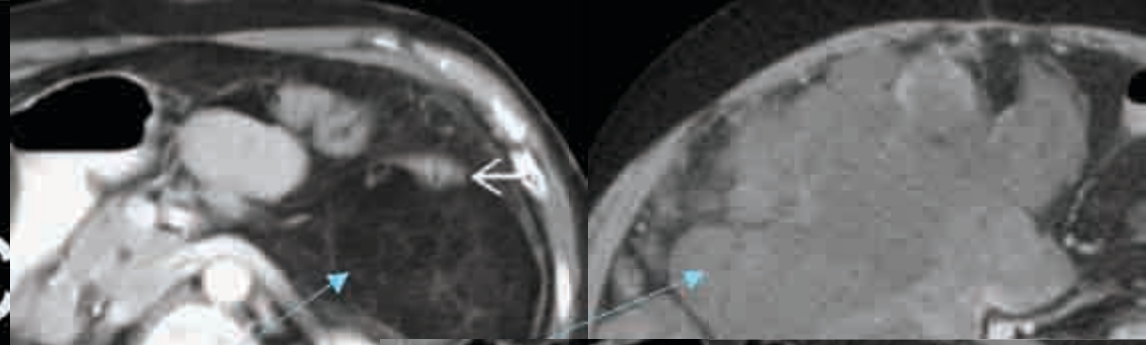
Axial CECT with splen
Hodgkin disease. Not
(arrow) with celiac (op
(curved arrow) involv



Axial CECT shows mantle of soft tissue around aorta. Stent (arrow) in left ureter to bypass obstruction.

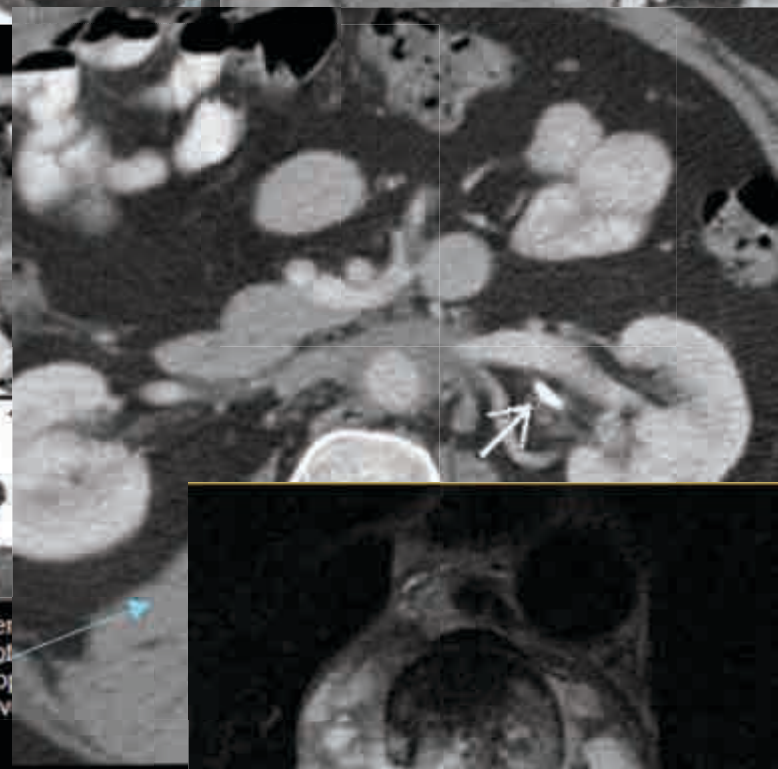
C

- Retroperitoneal mass
  - Primary tumors:
    - Fibrosarcoma/MFH
    - Liposarcoma
    - Leiomyosarcoma
  - Metastatic disease
  - Lymphoma
  - Retroperitoneal fibrosis
  - Infection – TB, AIDS, aortitis

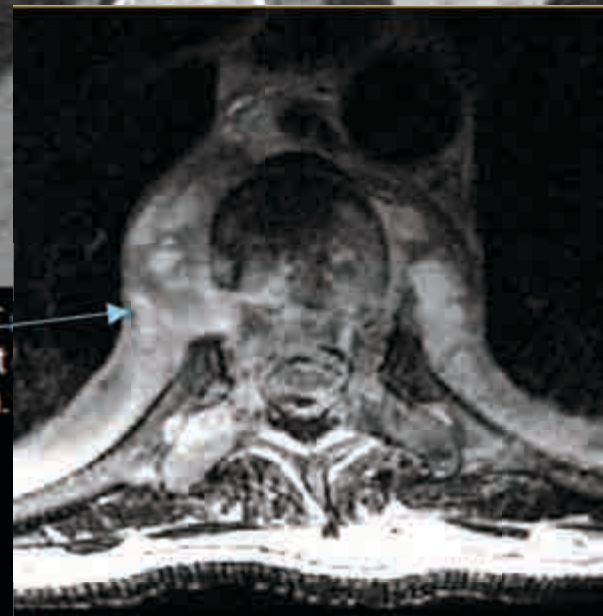


Axial CECT s
displaces bo
liposarcoma.

Axial CECT with splen
Hodgkin disease. Not
(arrow) with celiac (op
(curved arrow) involv

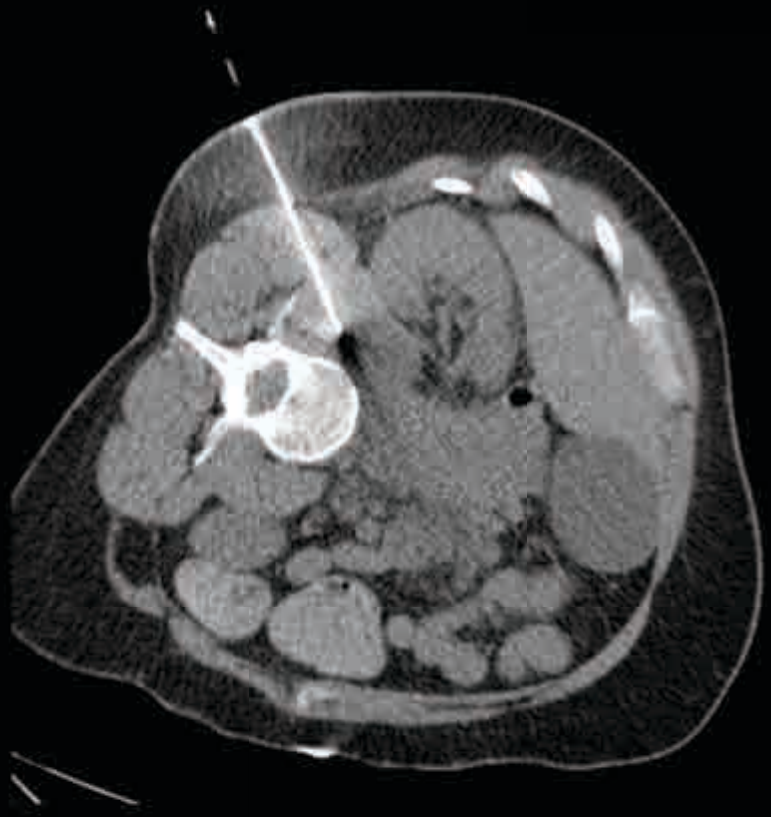


Axial CECT
aorta. Stent
obstruction.

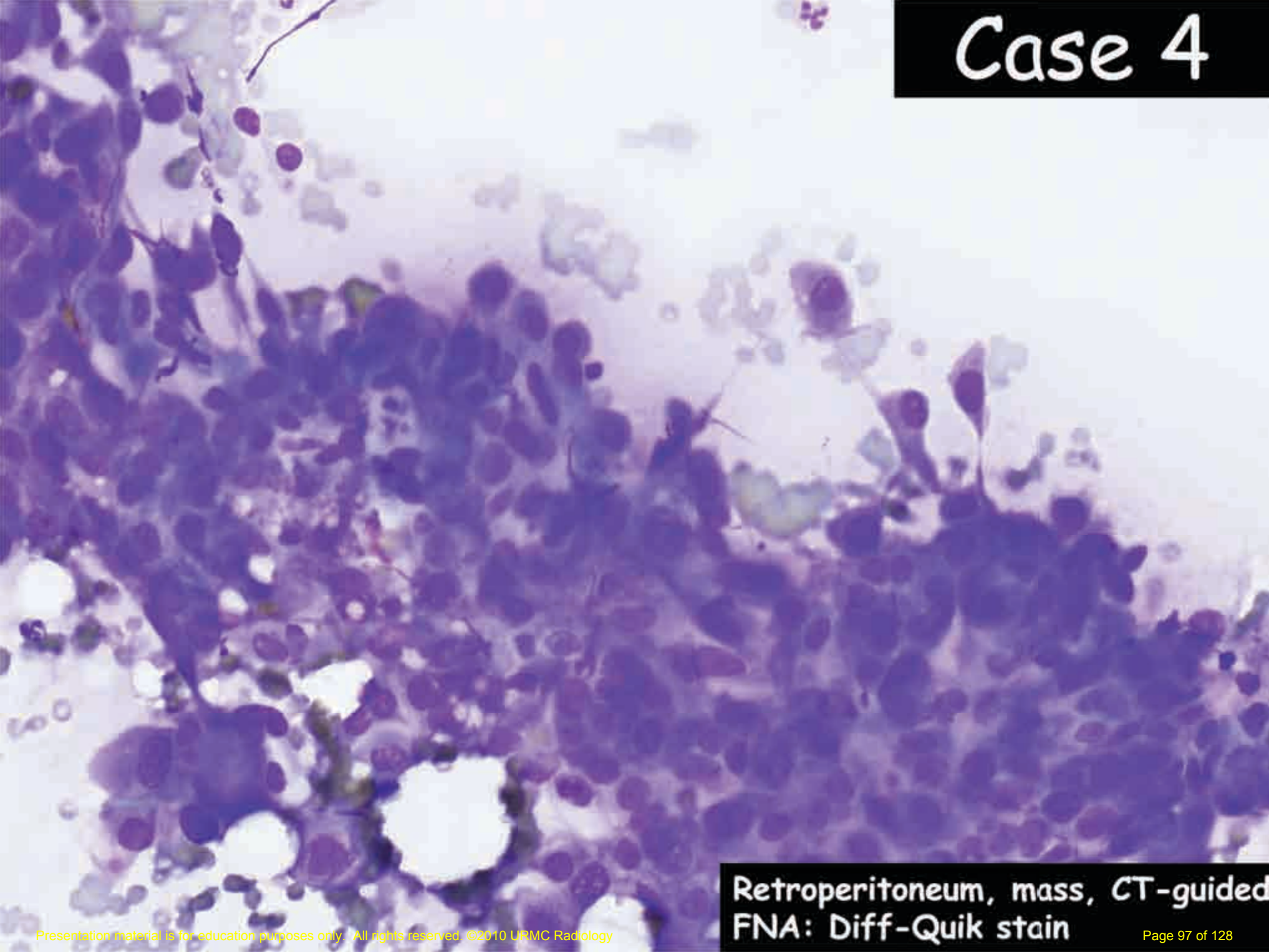


Axial T2WI MR through thoracic spine shows enlarged bilateral paravertebral soft tissues with multiple hyperintense collections.

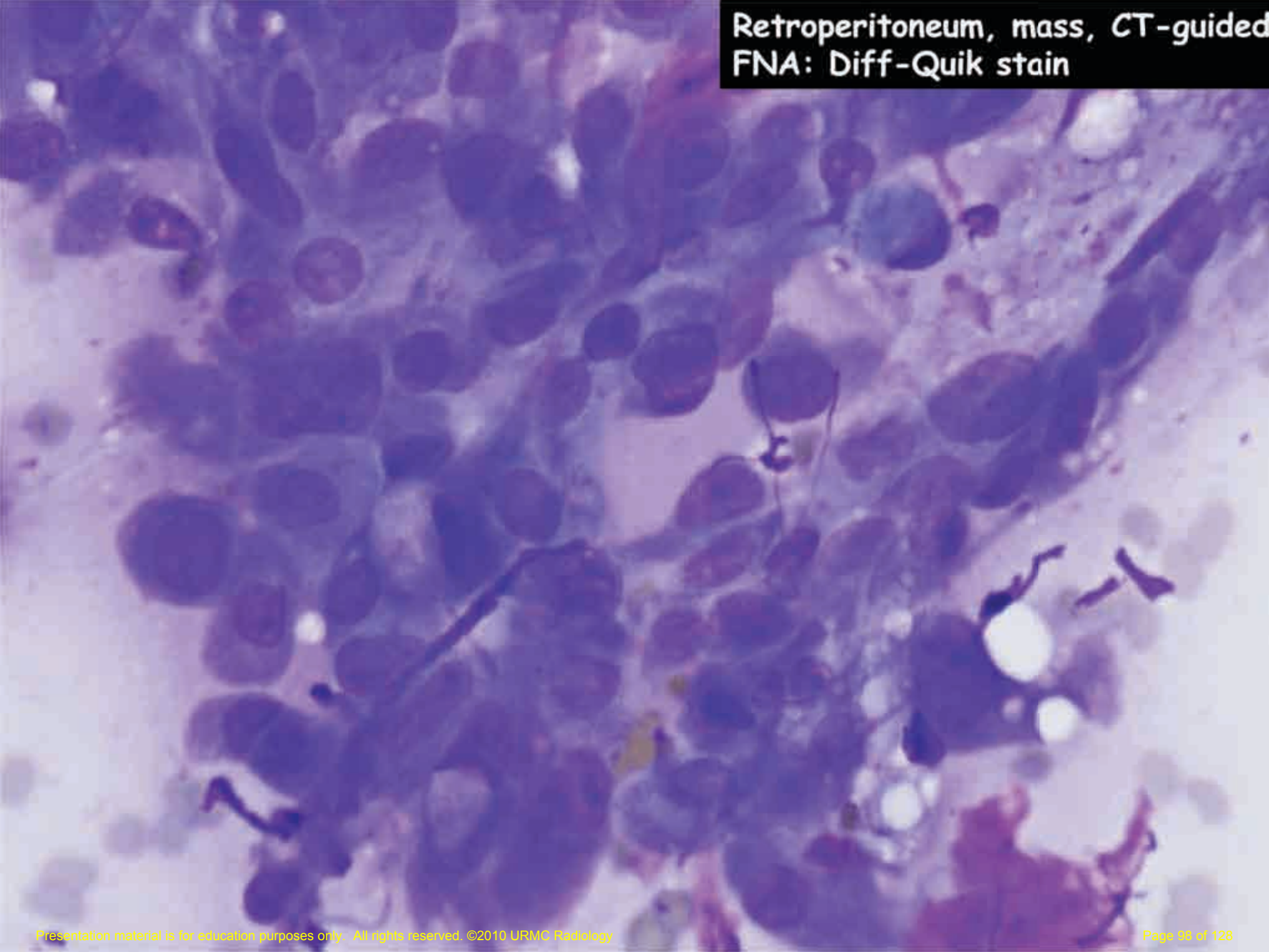
- Case 4 Path

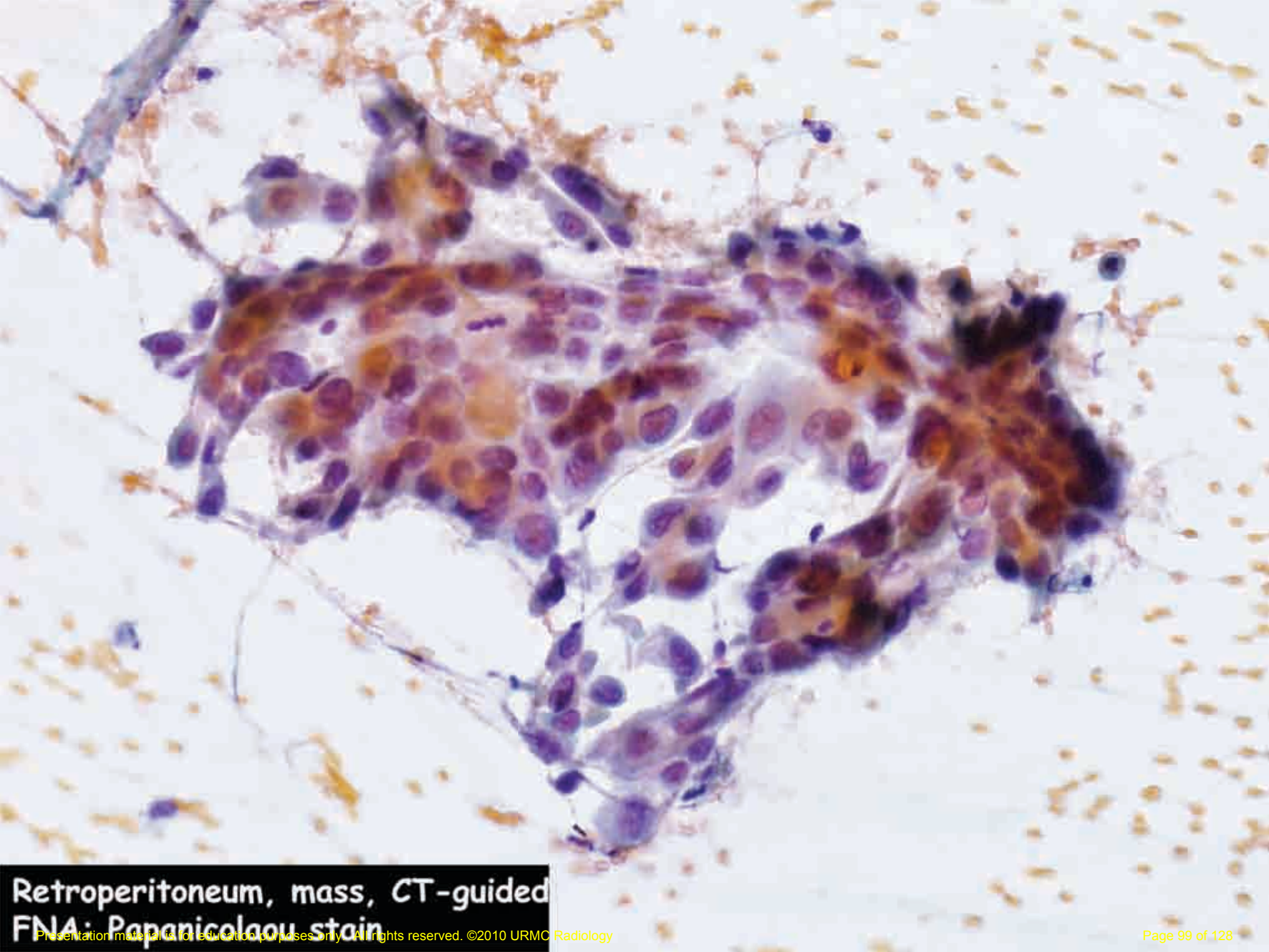


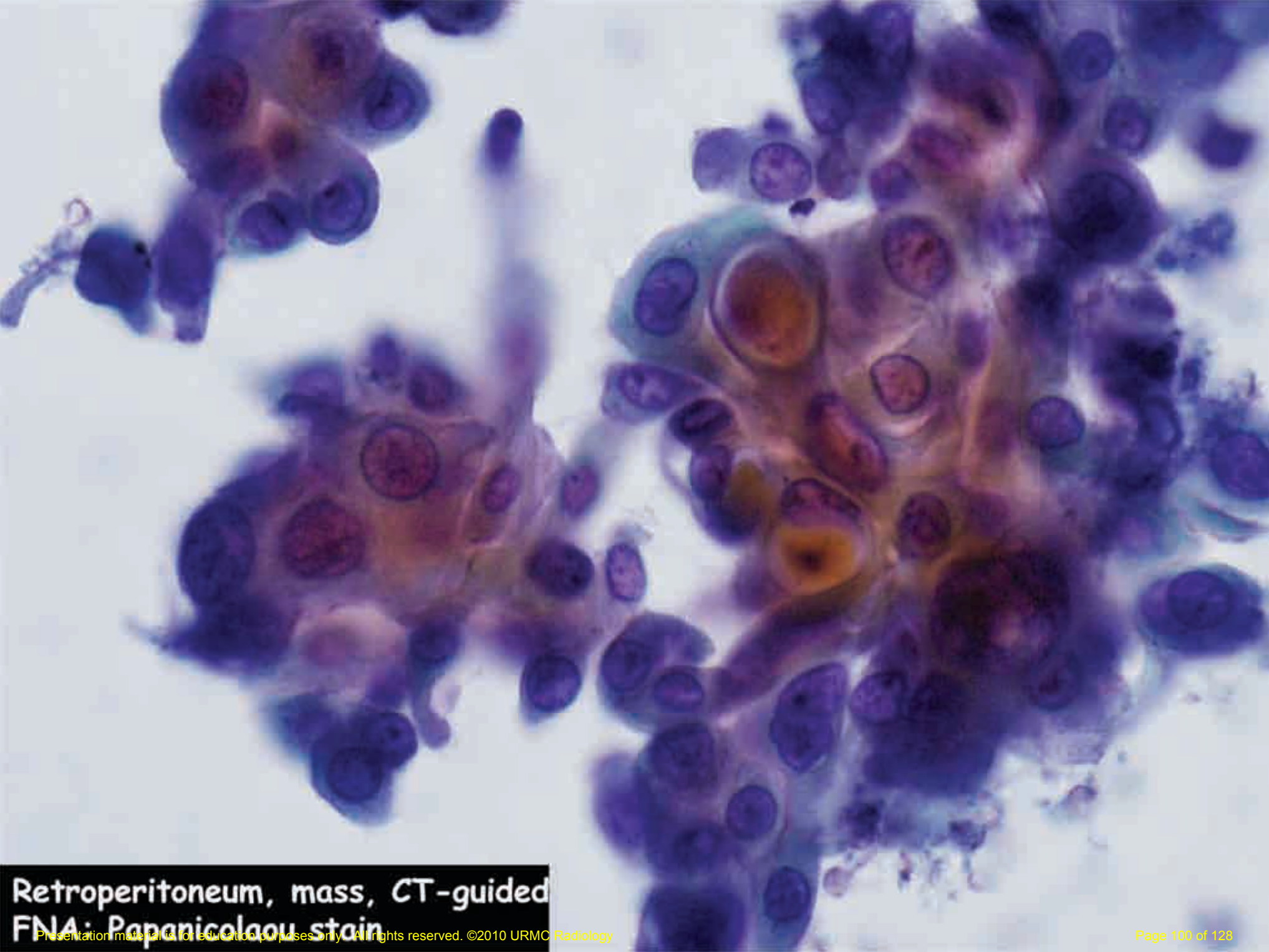
Case 4

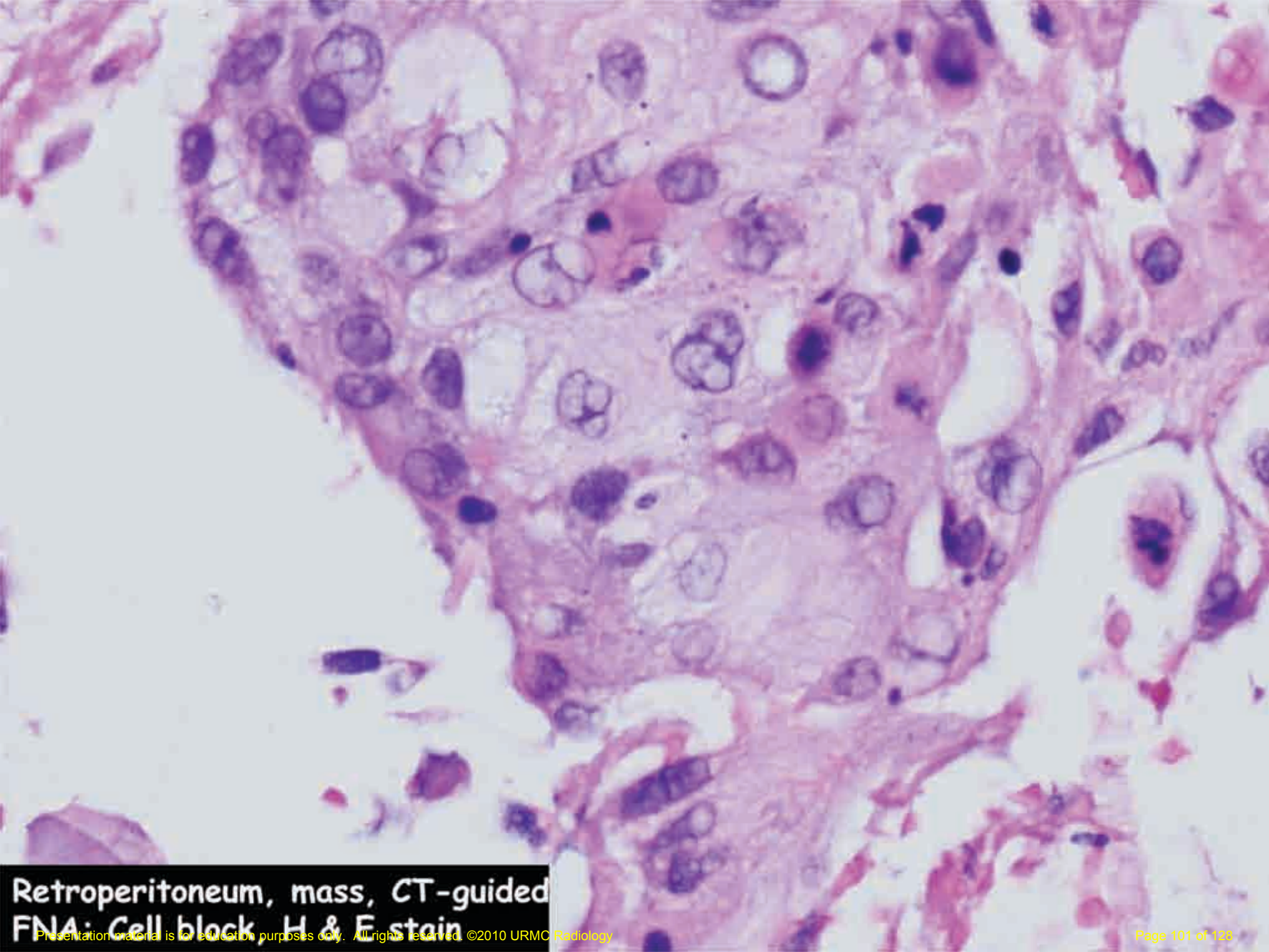


Retroperitoneum, mass, CT-guided
FNA: Diff-Quik stain







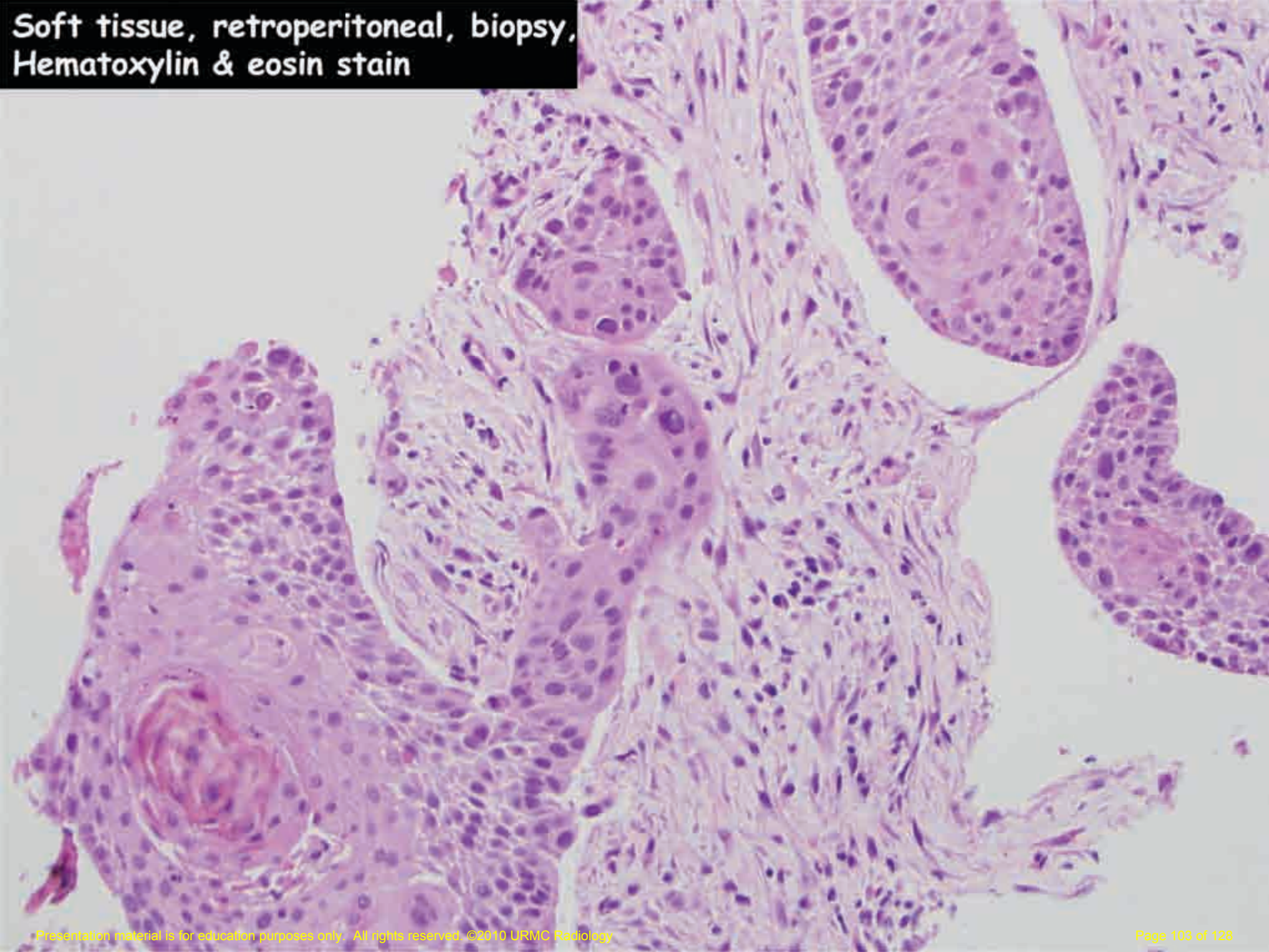


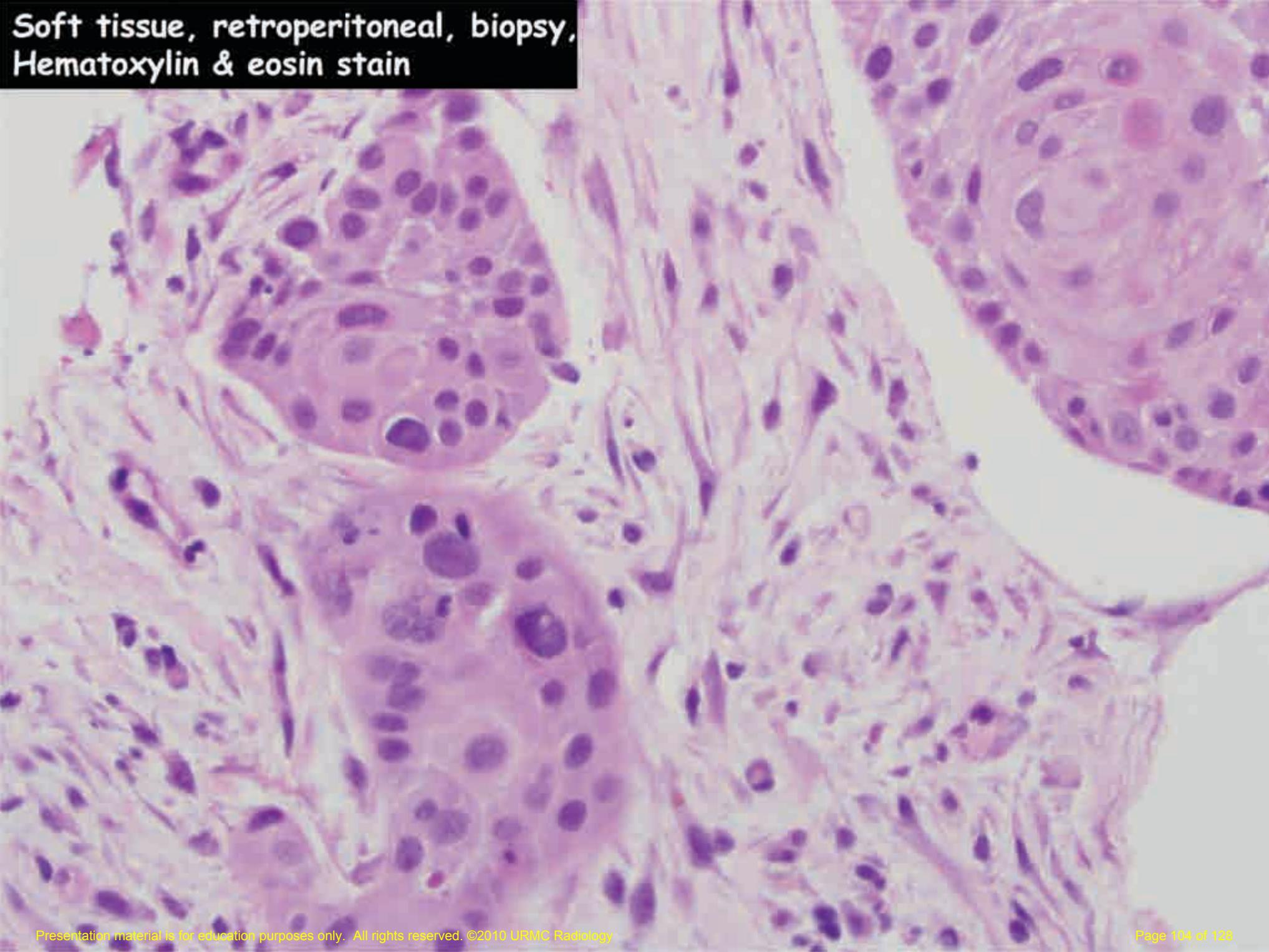
Retroperitoneum, mass, CT-guided fine needle aspiration:

Malignant tumor cells present derived from poorly differentiated carcinoma, most likely squamous cell carcinoma.

Cell block and cytologic preparations examined.

Soft tissue, retroperitoneal, biopsy,
Hematoxylin & eosin stain





Soft tissue, retroperitoneal, biopsy:

Squamous cell carcinoma involving soft tissue/skeletal muscle, consistent with metastatic carcinoma.

Cervical carcinoma

- Still #1 cause of cancer death among women in many countries, now #8 in US
- 95% of cervical squamous cell carcinoma associated with high risk HPV
- 2/3 stage I or II when diagnosed (in US)
- Spreads via lymphatics to regional nodes or direct extension to vagina, uterus, parametrium, etc.
- Distant mets to aortic/mediastinal LN, lung, bone, ovary, peritoneum
- 5 year survival stage I: 95%, II: 80-90%, III: 50%, IV: 25-35%

Case 4

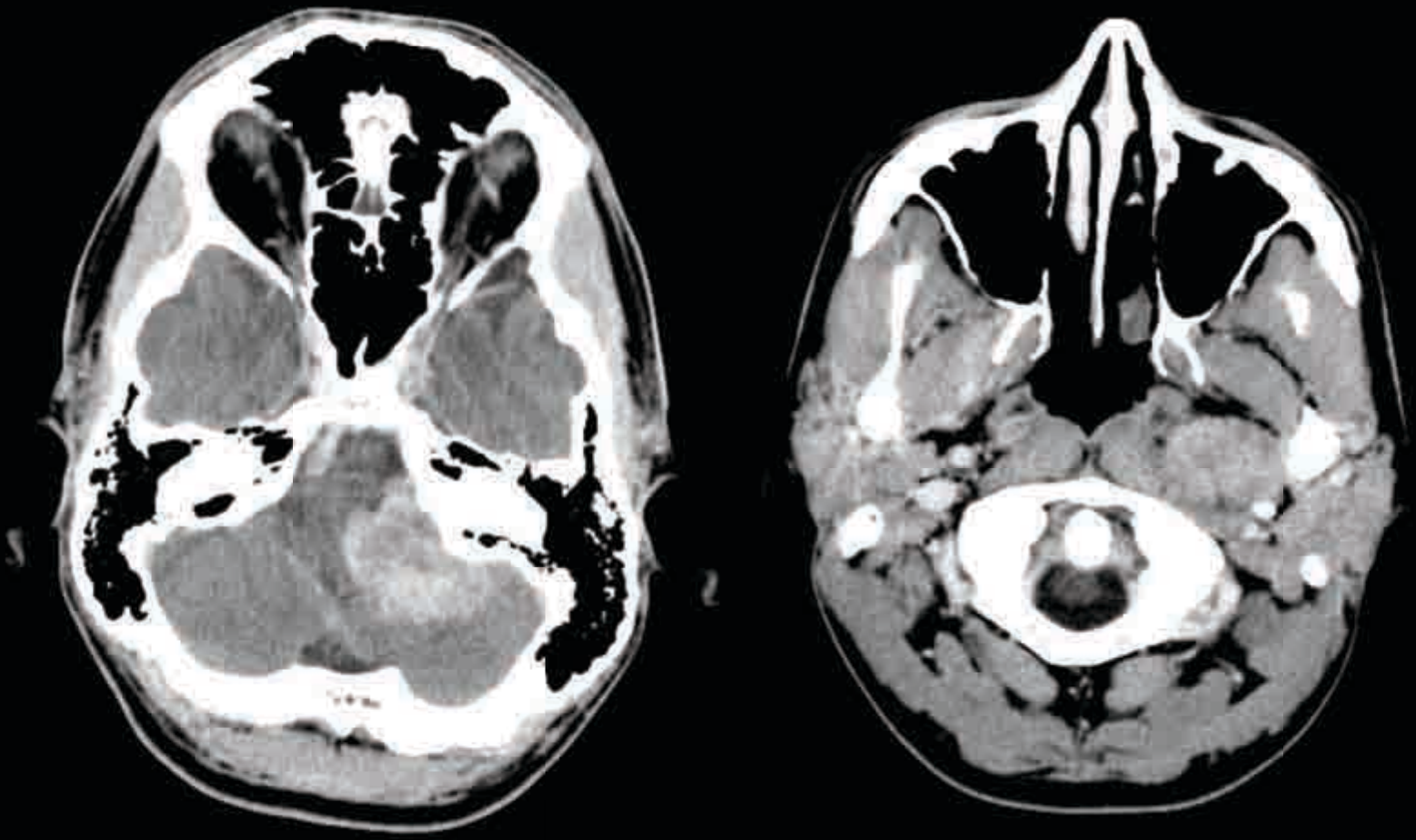
- Lymphatic or hematogenous spread to retroperitoneum:
  - Testicular ca, melanoma, ovary, prostate, lung, breast

Case 5

46 year old female with progressive left hearing loss

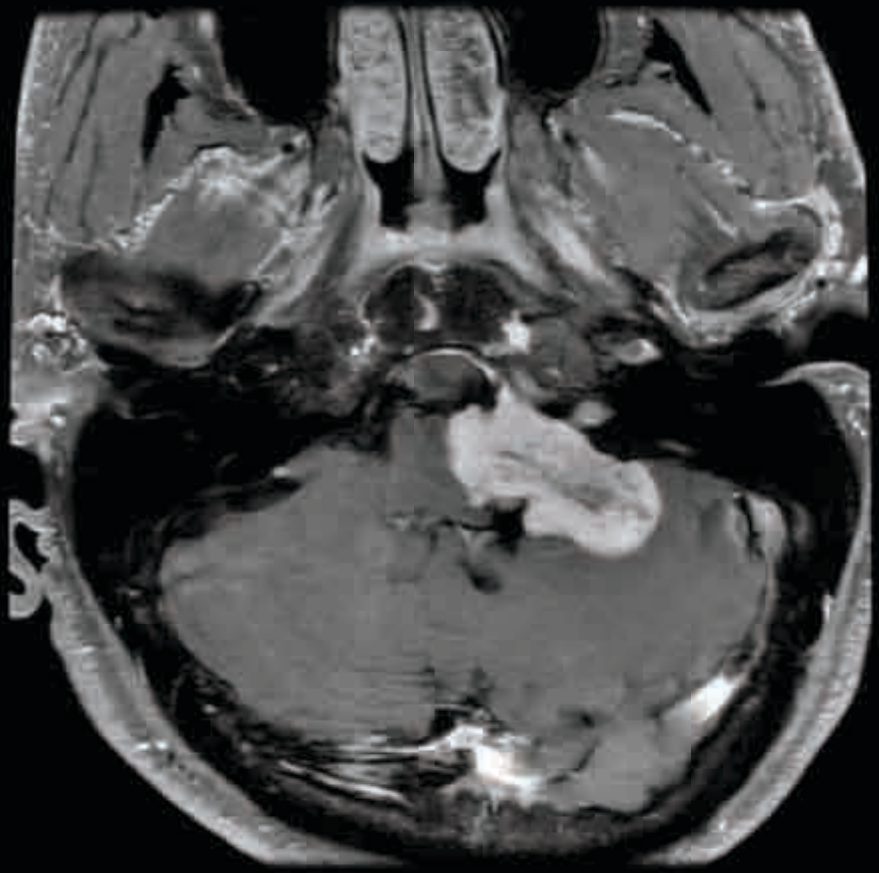
Case 5

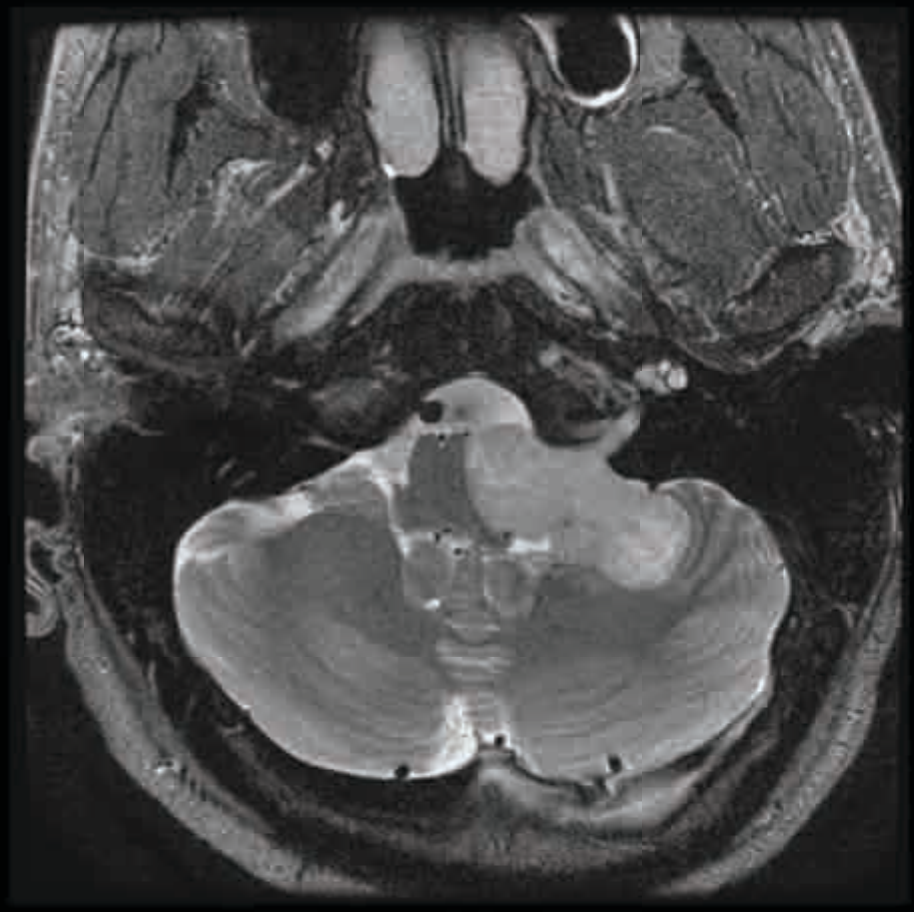
46 year old female with progressive left hearing loss



Case 5

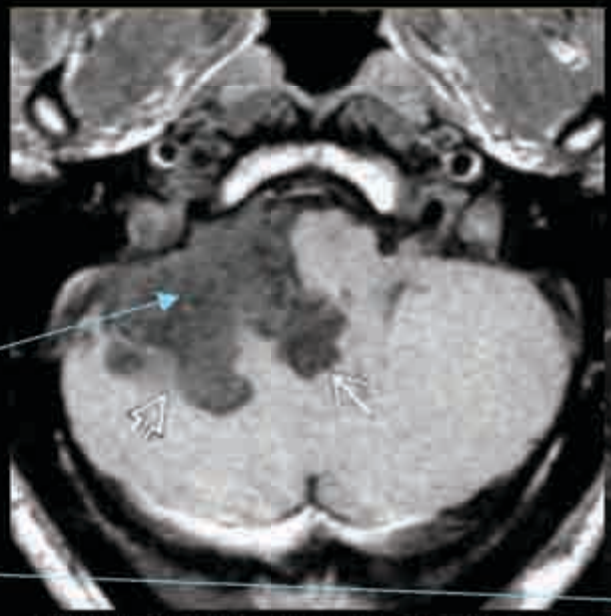
- What is your differential?



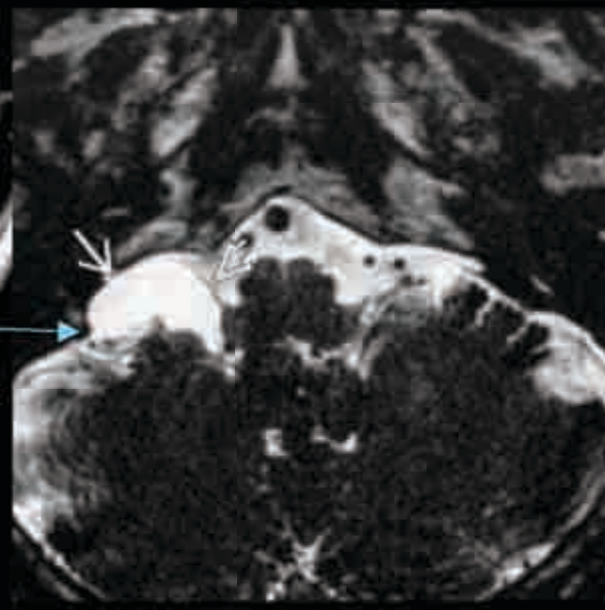


Case 5

- Cerebellopontine angle mass differential
  - Meningioma
  - Schwannoma
  - Metastases
  - Epidermoid
  - Arachnoid cyst

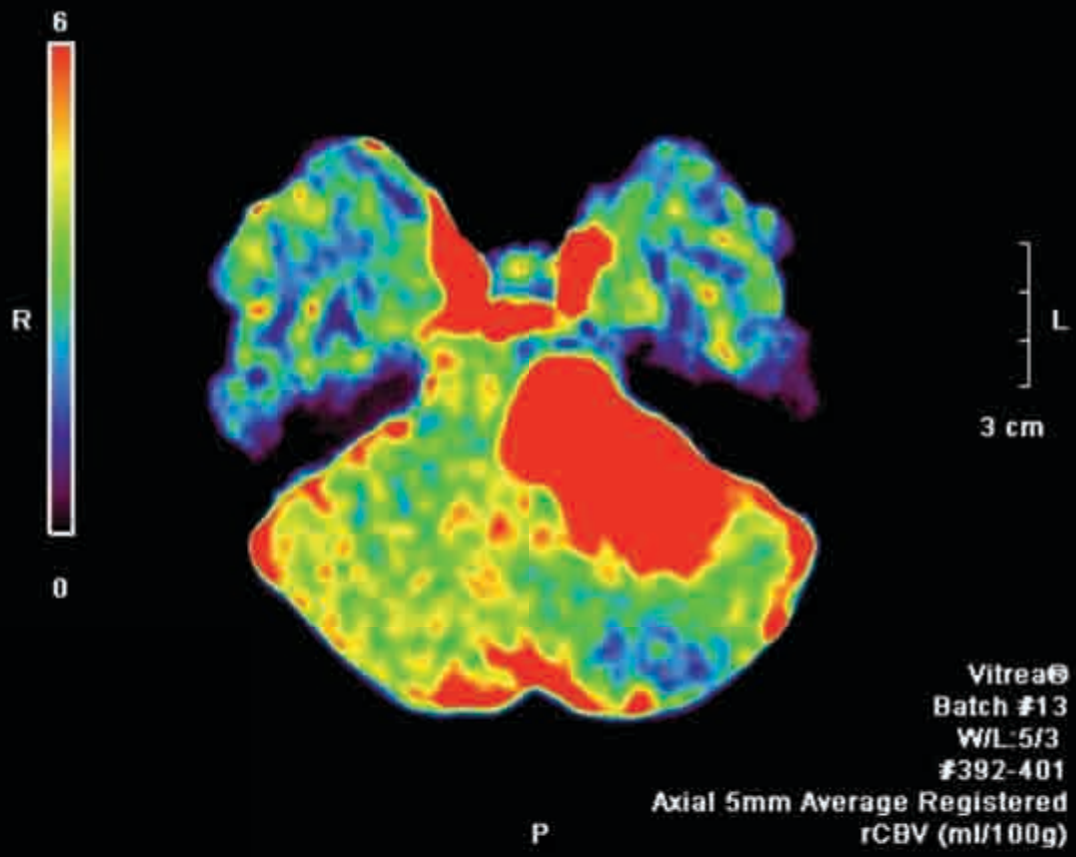


Axial T1WI MR shows a low signal mass in the right CPA cistern that insinuates and enlarges the foramen of Luschka (white arrow) and scallops the ventral cerebellar hemisphere (white open).



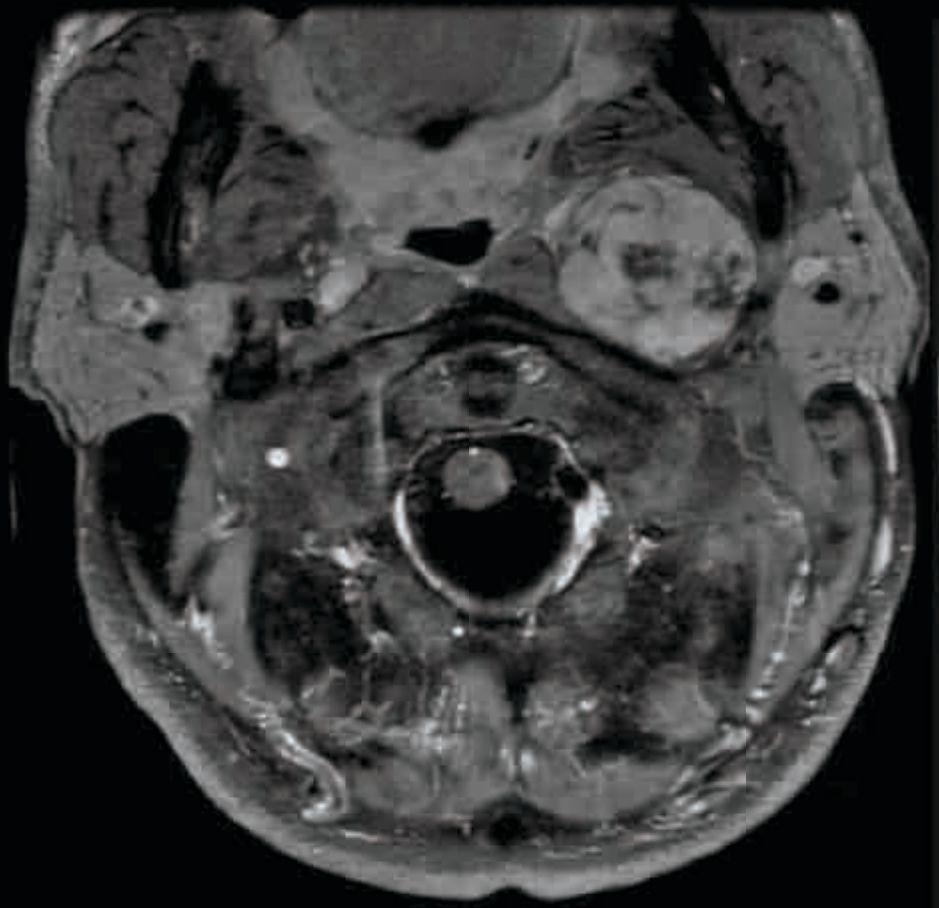
Axial T2WI FS MR shows a high signal lesion (white arrow) in low CPA cistern. Note the anterior displacement of proximal CN8 by arachnoid cyst (white open). The high signal results from absence of CSF flow.

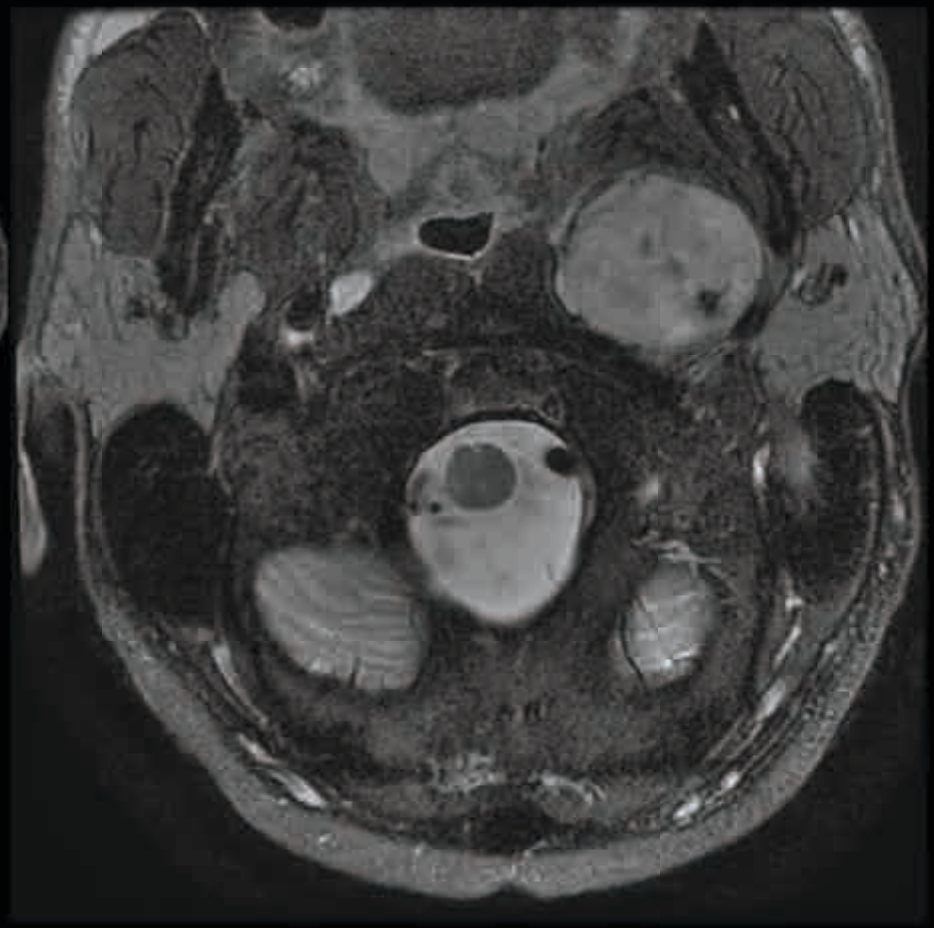
Case 5



Case 5

- What is the differential?



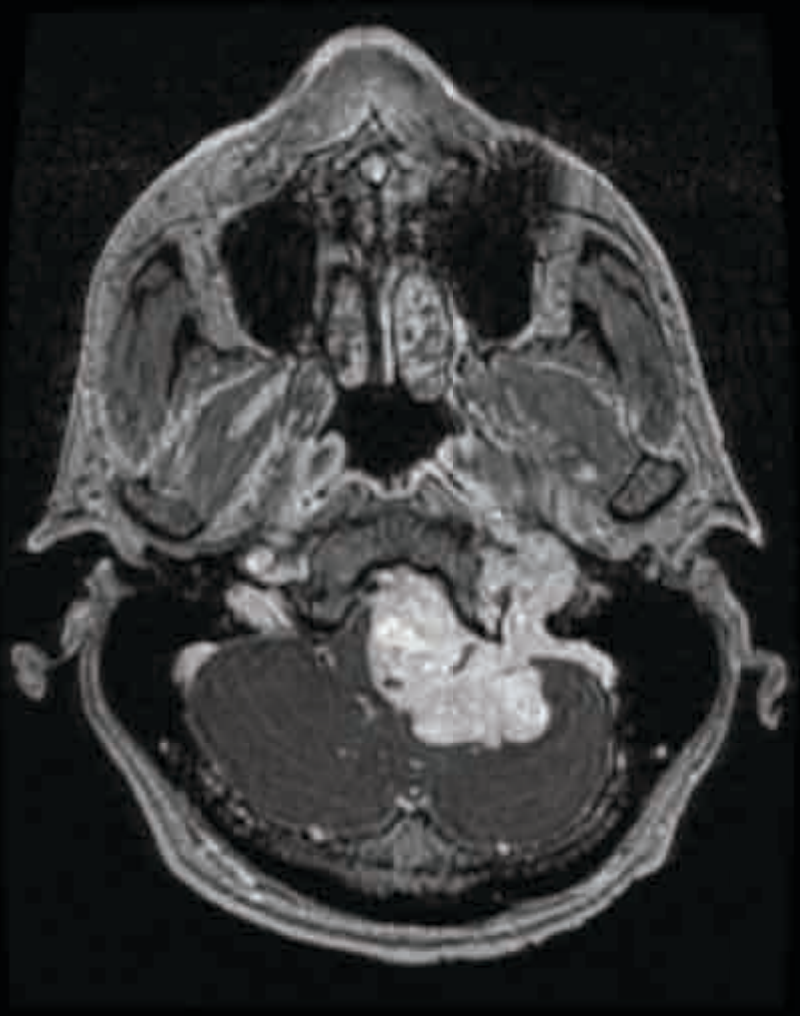


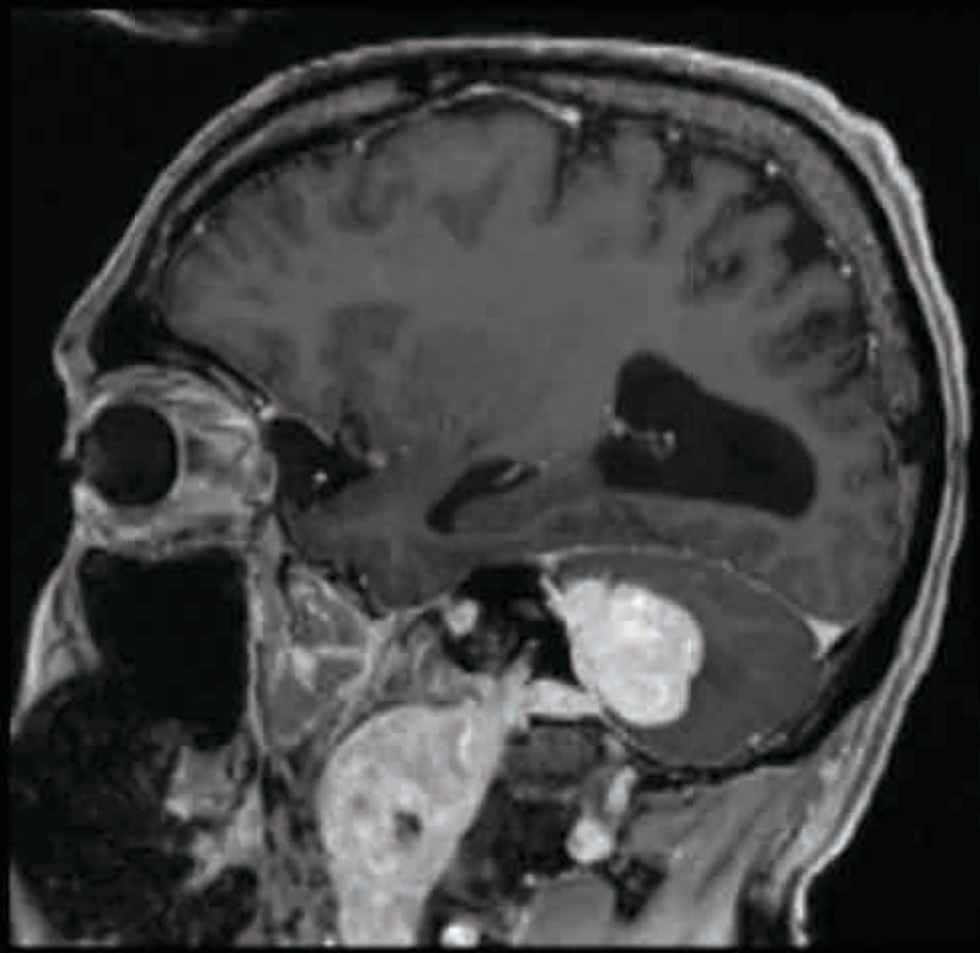
Case 5

Jugular foramen mass differential

- Glomus vagale tumor
- Carotid body tumor (if large)
- Meningioma
- Schwannoma
- Metastases

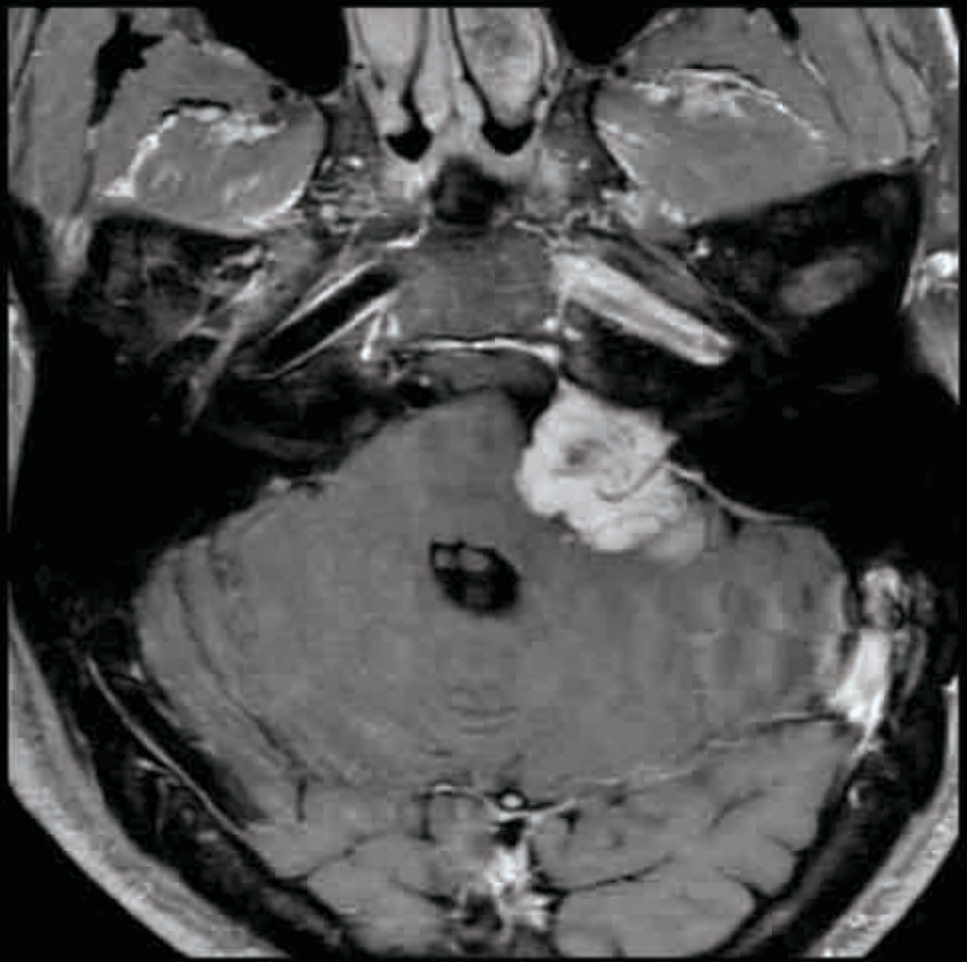
Case 5

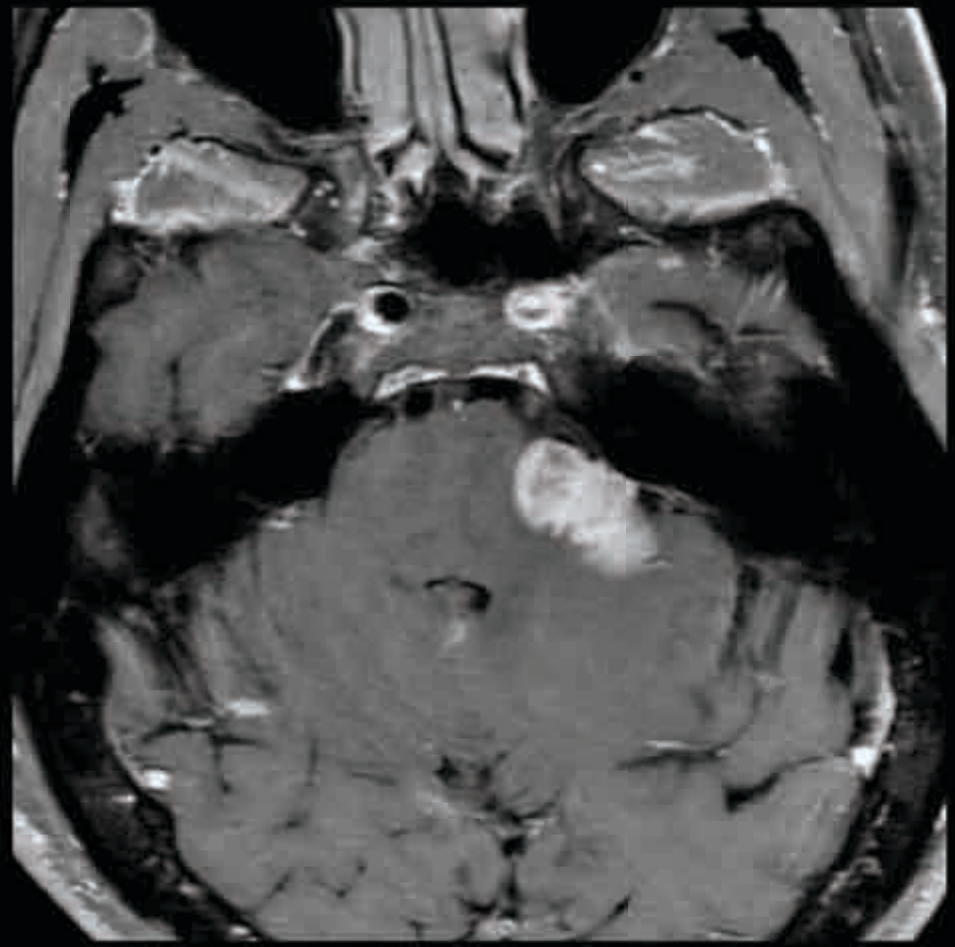




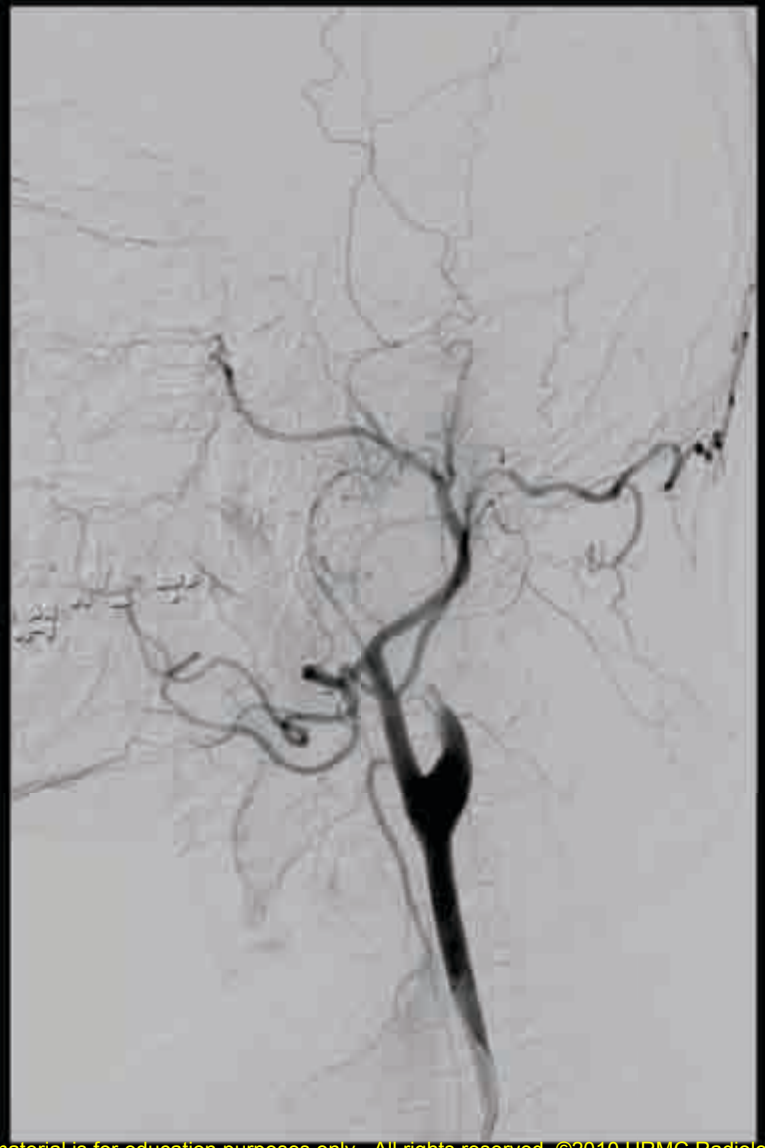
Case 5

- What do you think of the carotids?



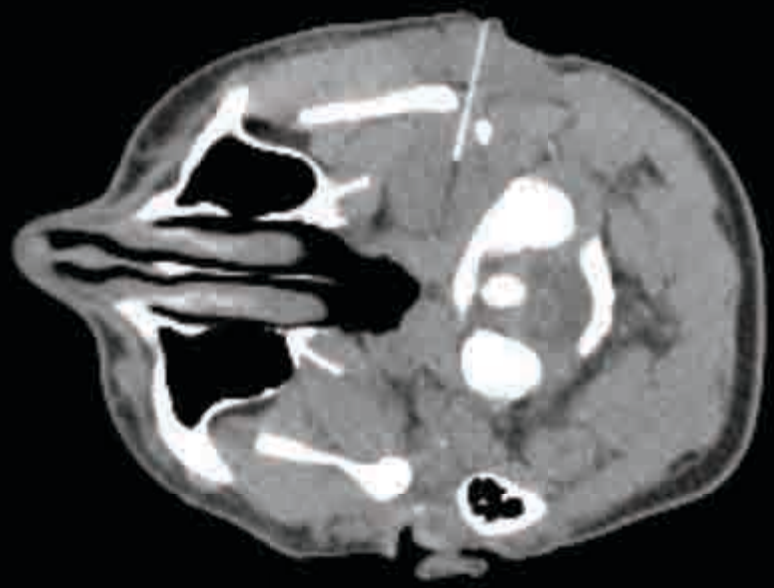


Case 5

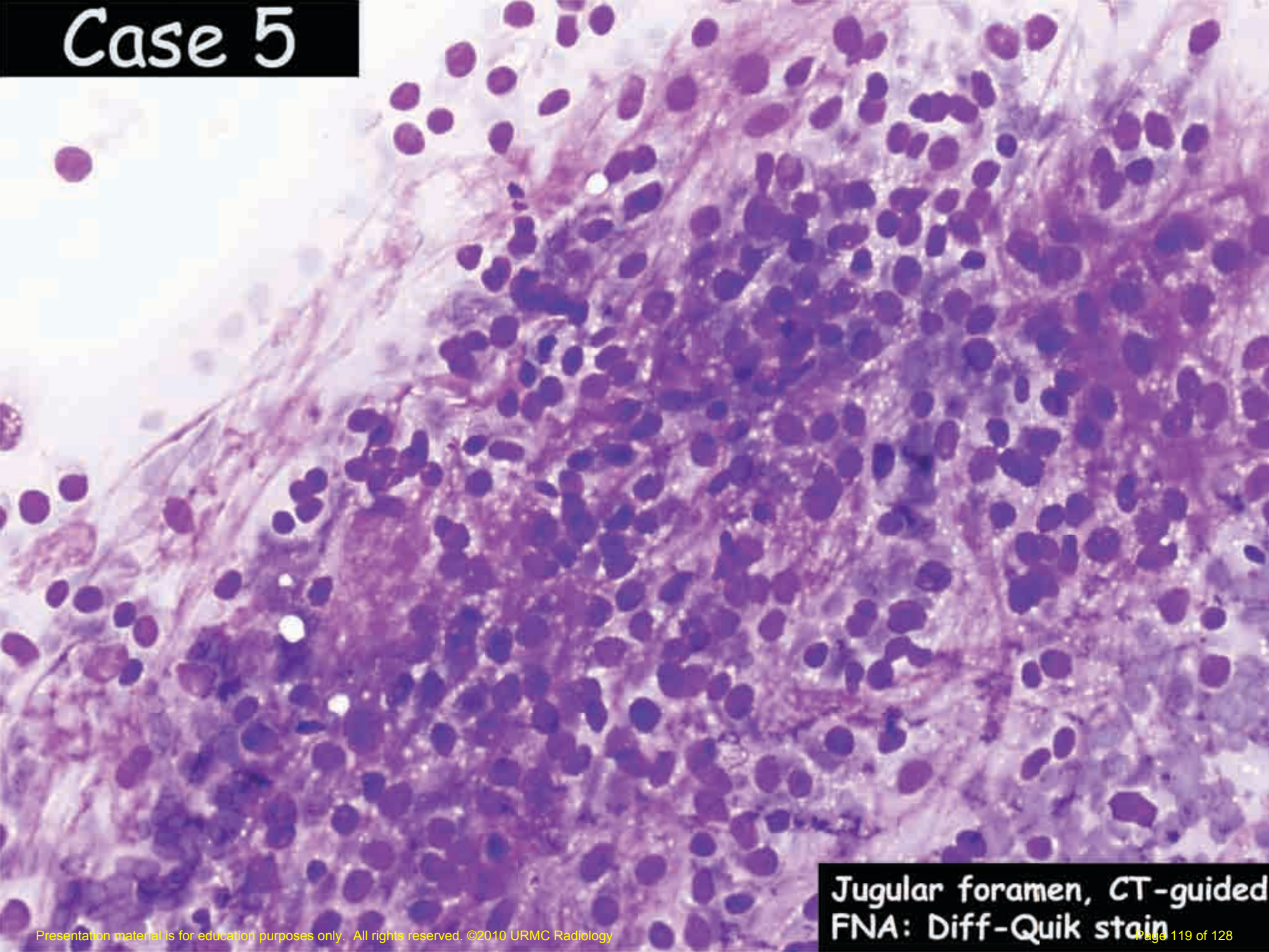


Case 5

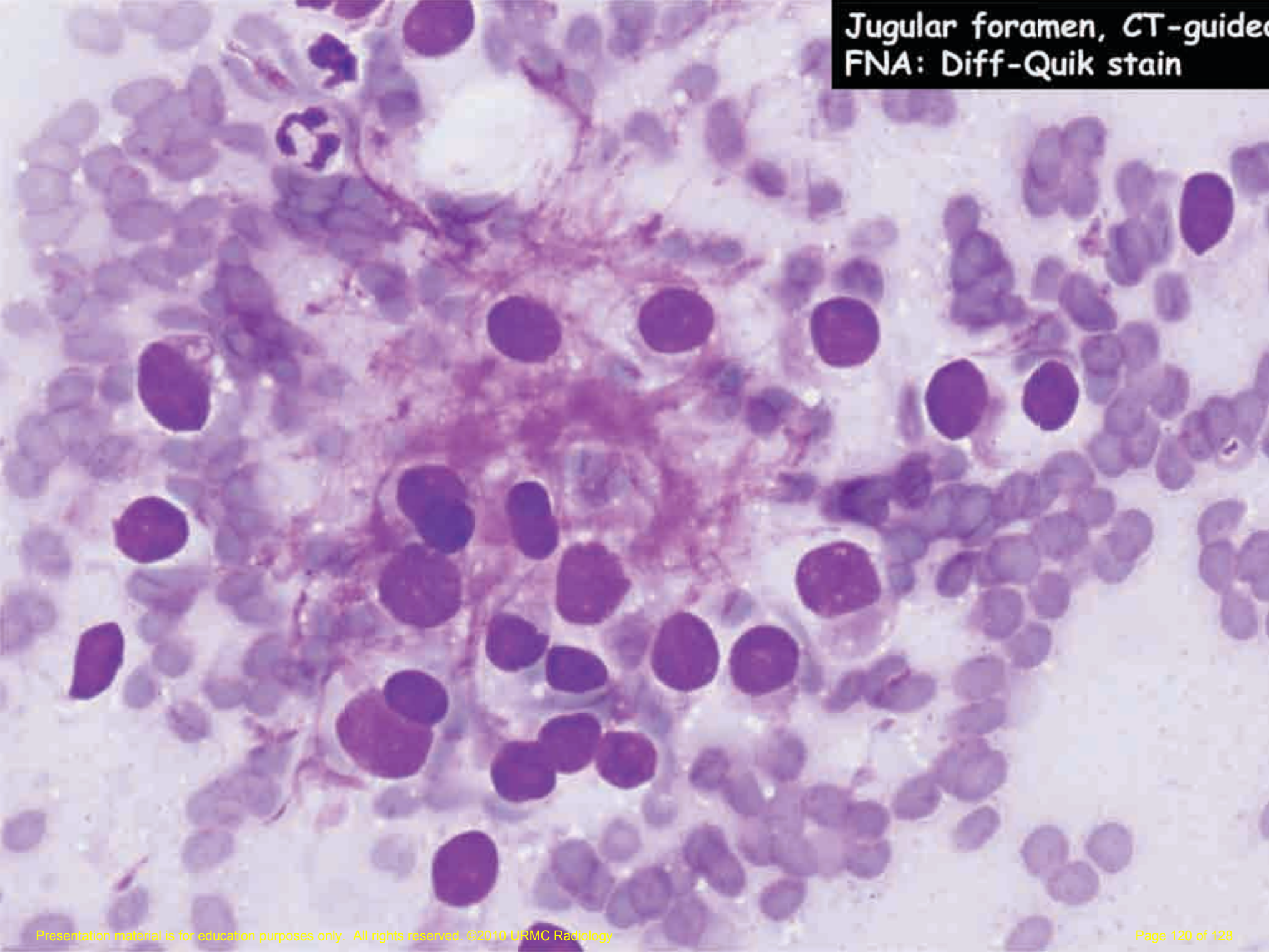
- Case 5 Path

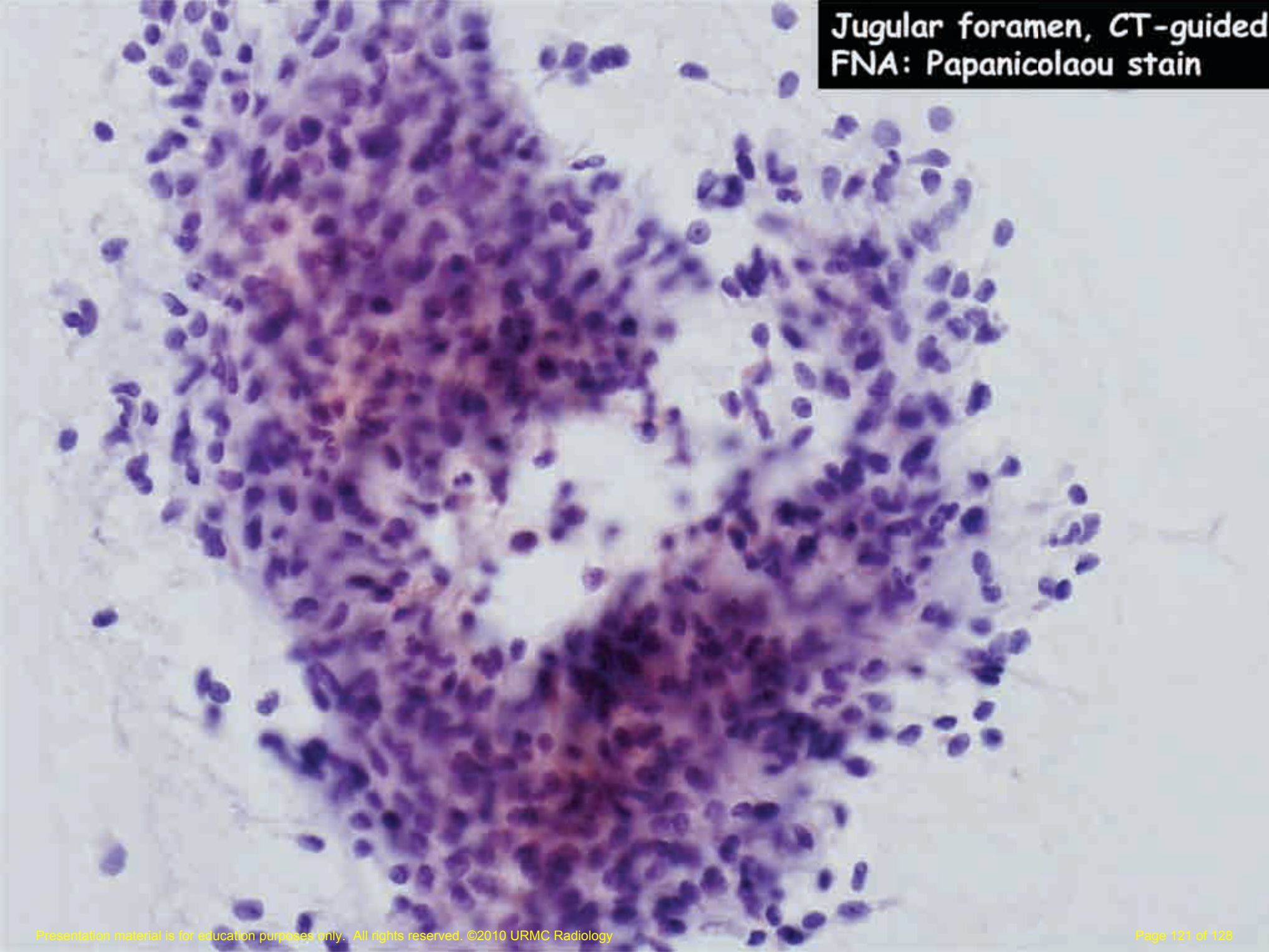


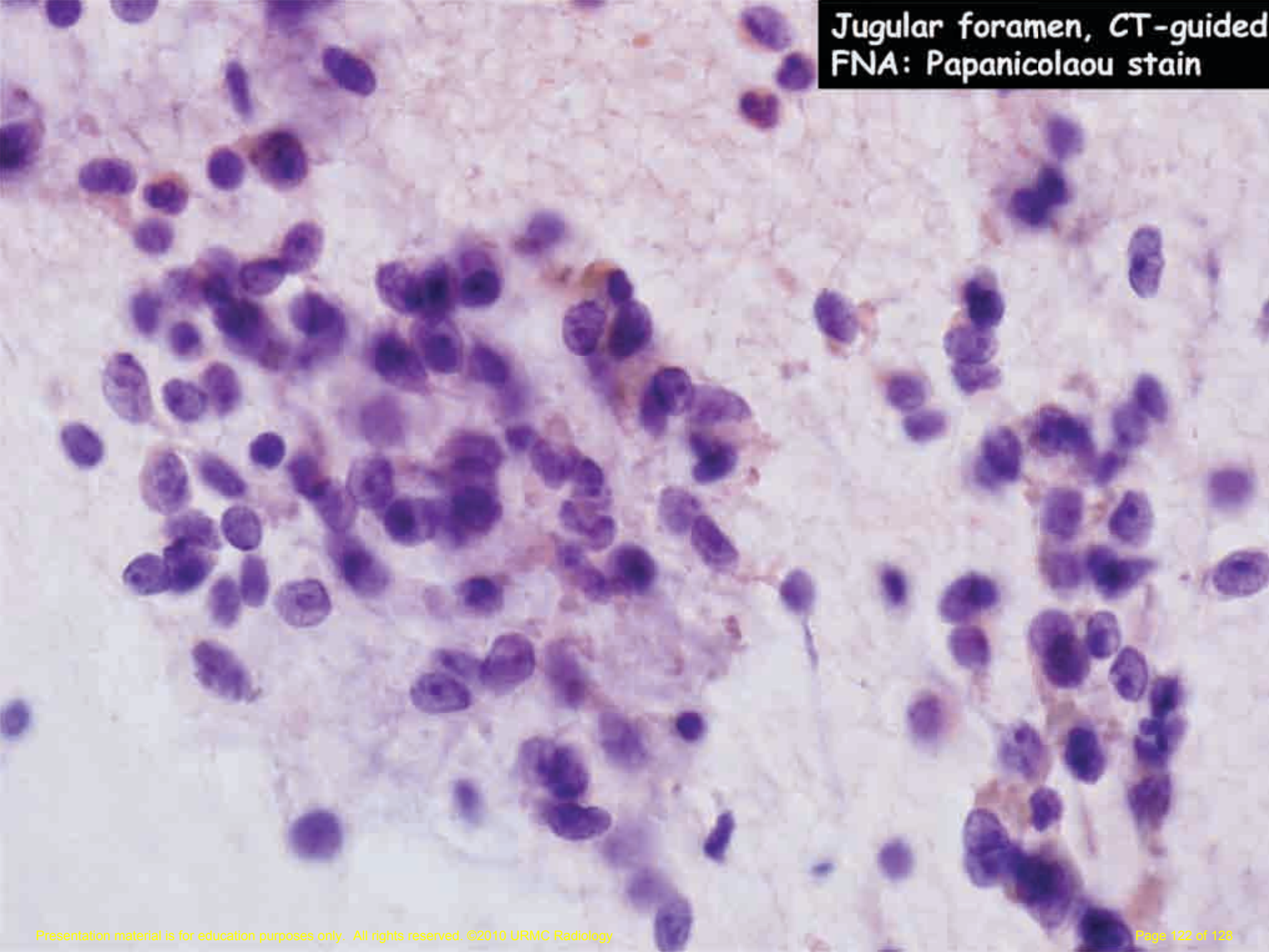
Case 5

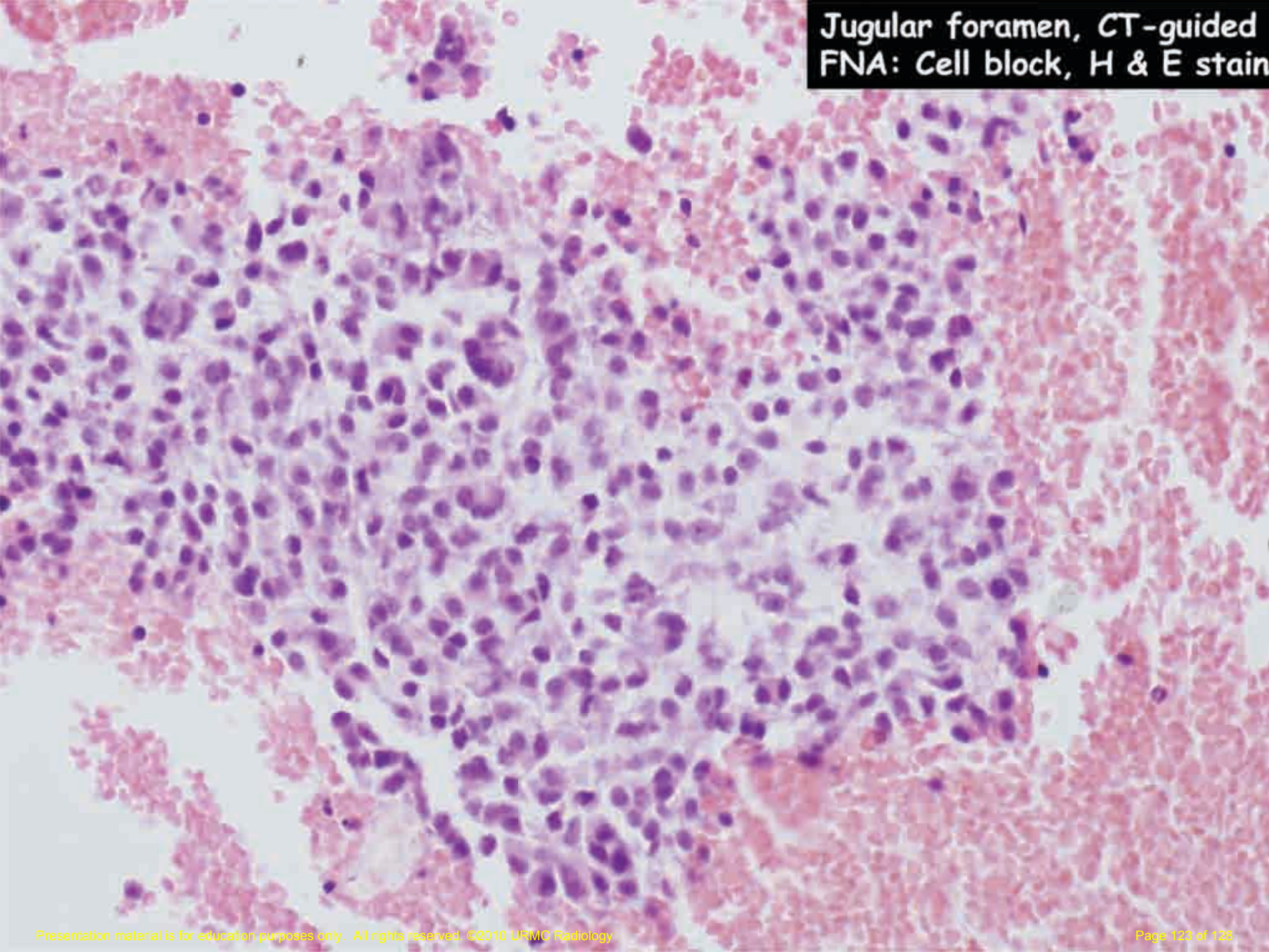


Jugular foramen, CT-guided FNA: Diff-Quik stain

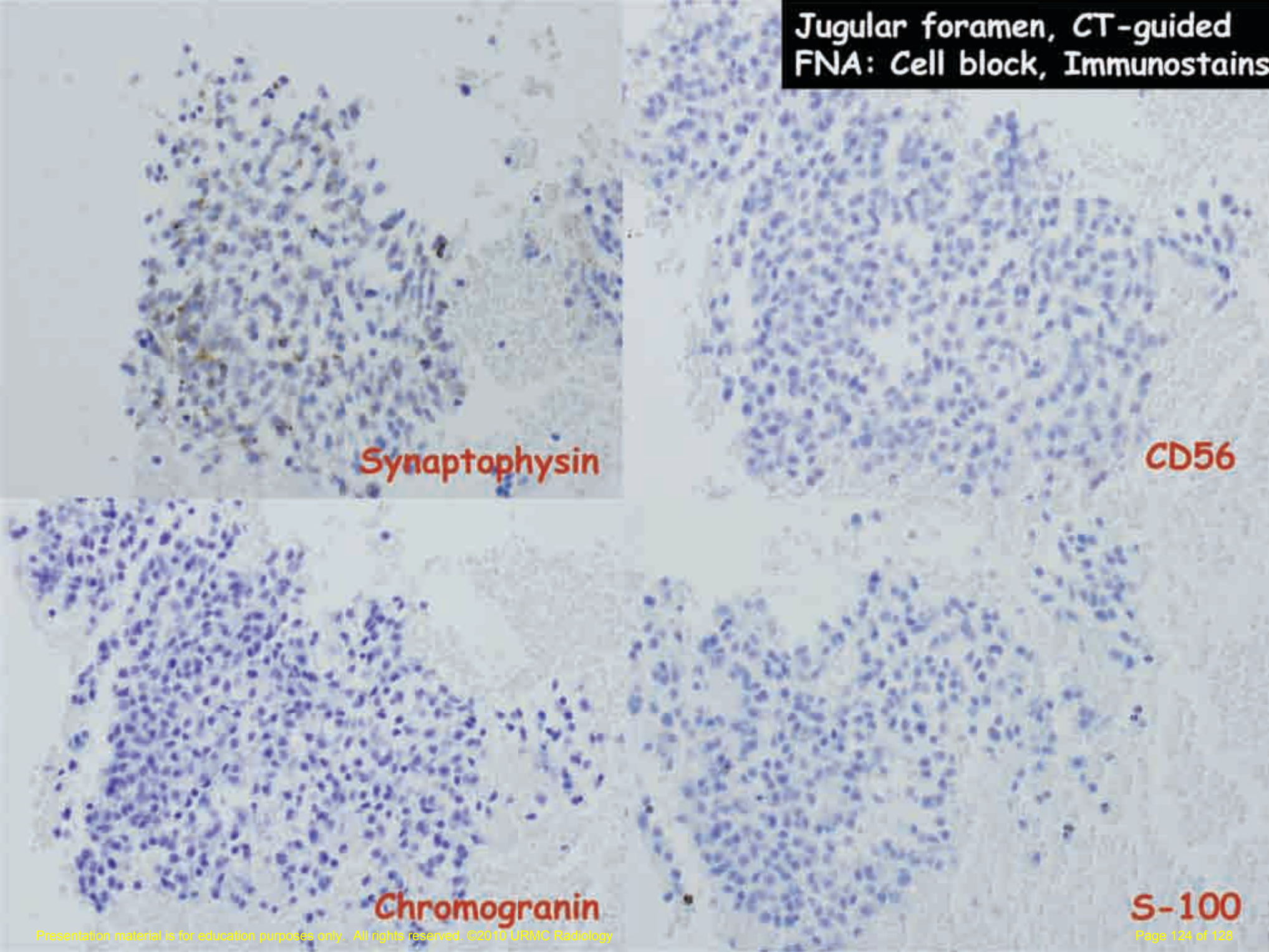








Jugular foramen, CT-guided FNA: Cell block, Immunostains



Jugular foramen, CT-guided fine needle aspiration:

Paraganglioma.

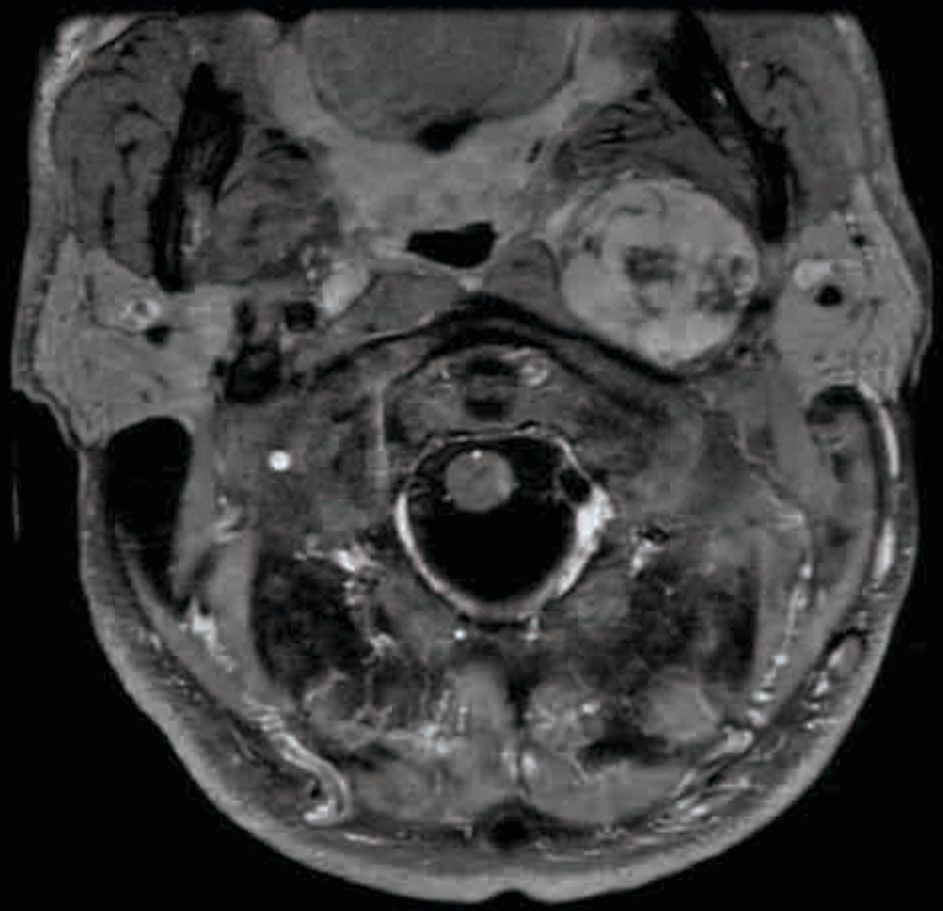
Cell block and cytologic preparations examined.

Paraganglioma

- =glomus jugulare tumor when arises in jugular foramen of temporal bone
- Most common tumor of middle ear
- 85% arise in jugular bulb causing middle ear mass or mass in external auditory canal
- Often present with conductive hearing loss or tinnitus
- Histologically usually appear benign, but can't predict which ones will metastasize
- Can be locally invasive and often present late, but only about 5% metastasize

Case 5

- Salt and Pepper on T1W (sometimes T2)



Case 5

- Glomus tumors are paragangliomas – named for location
  - Glomus jugulotypanicum – middle ear and jugular foramen
  - Glomus vagale tumor – from the vagal nerve
  - Carotid body tumor – will splay the carotids
  - Glomus tympanicum – in the middle ear
- Not to be confused with glomus body tumors of fingers
  - chemoreceptors