Rad Path July 30, 2010

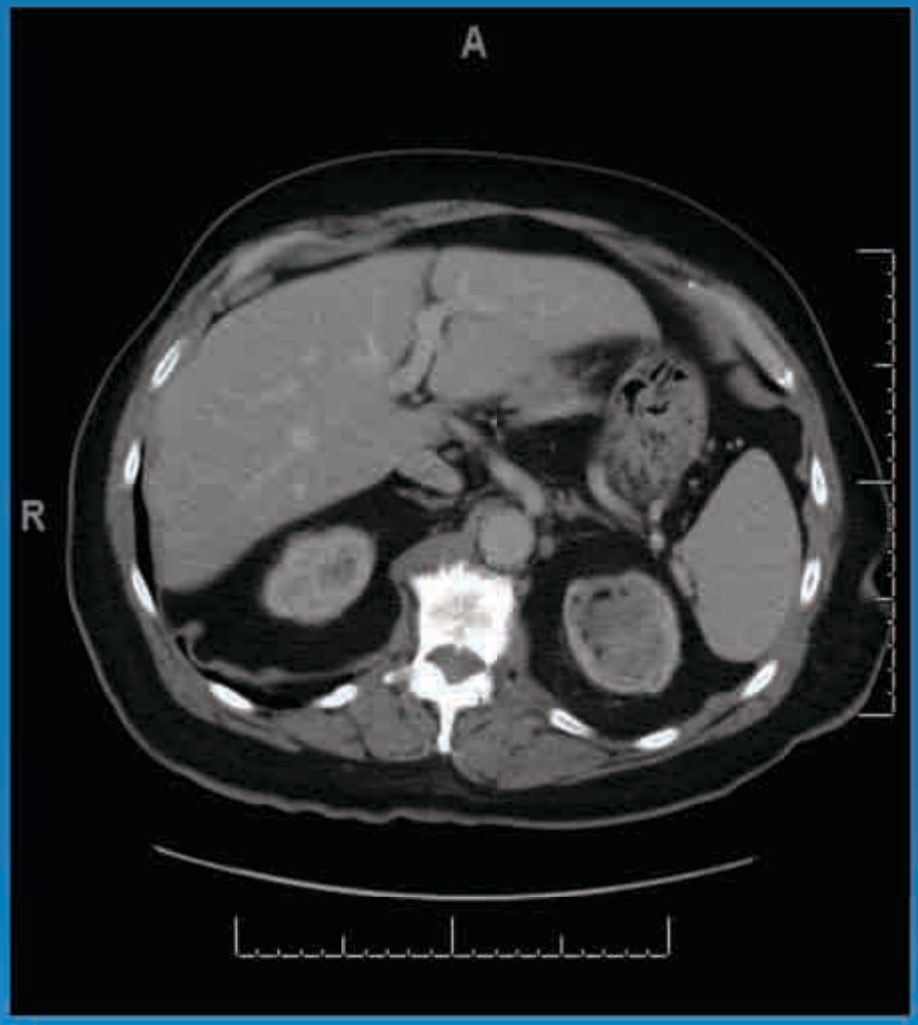
Matthew Thrall, Radiology Resident

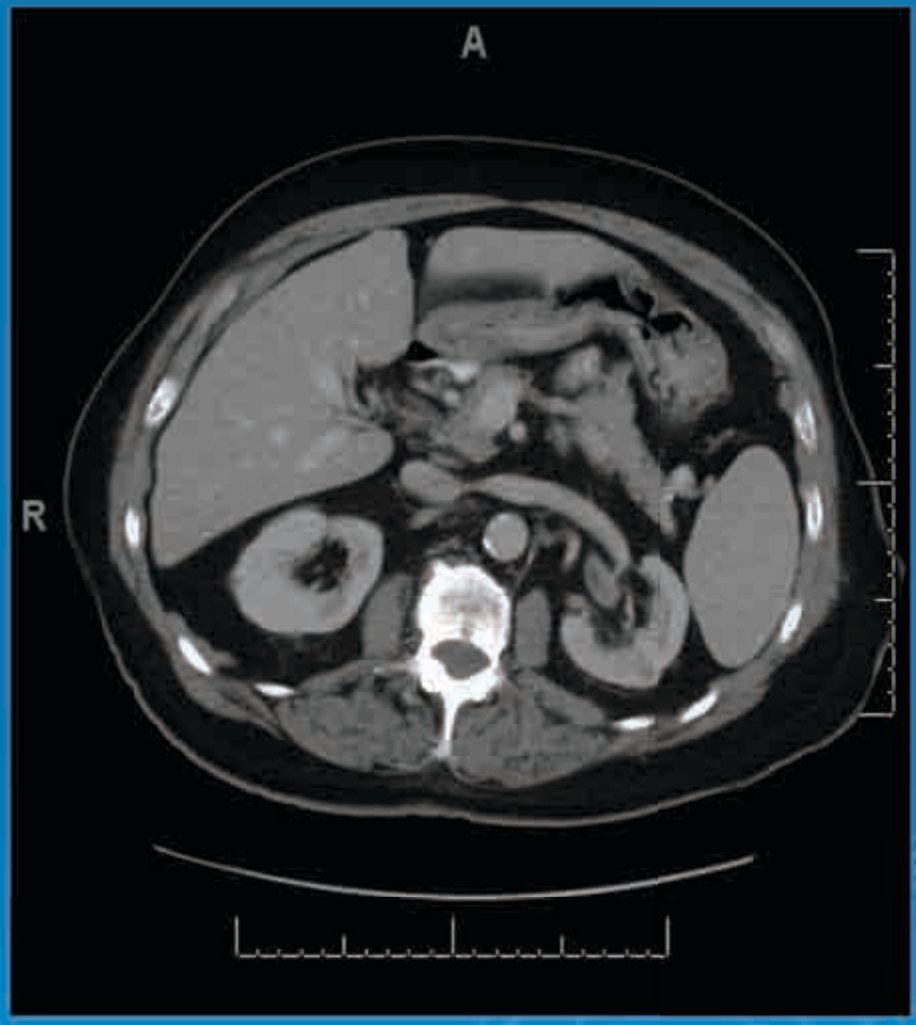
Kirsten Woolf, Cytopathology Fellow

1st case

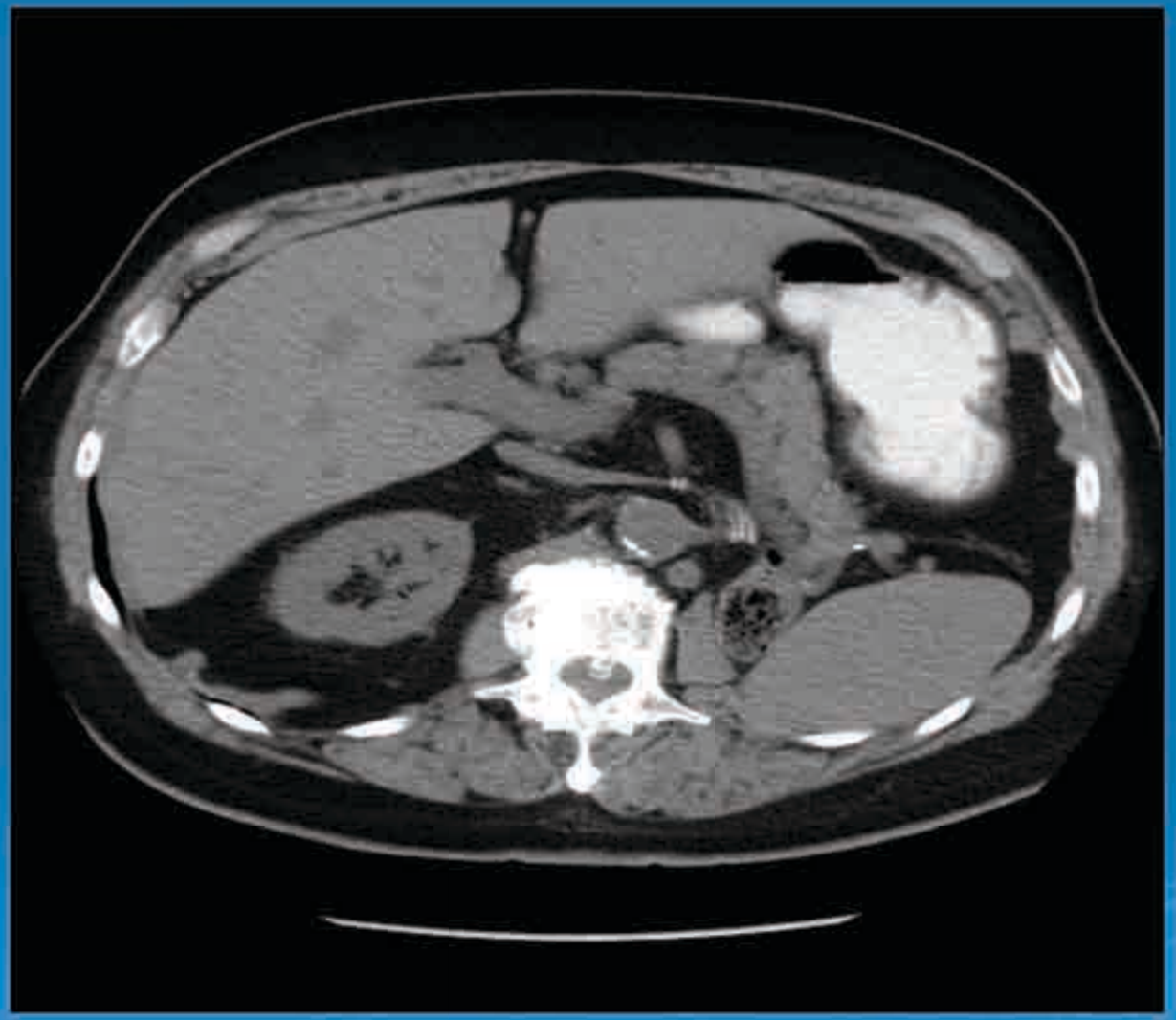
- 1st diagnosis is 20 times more common in this dog than normal dogs
- Average age for this diagnosis in dogs is at 11 dog-years old.
- Treatment for your poor dog includes Piroxicam

78 year-old w/ PMH withheld for sake of this conference.

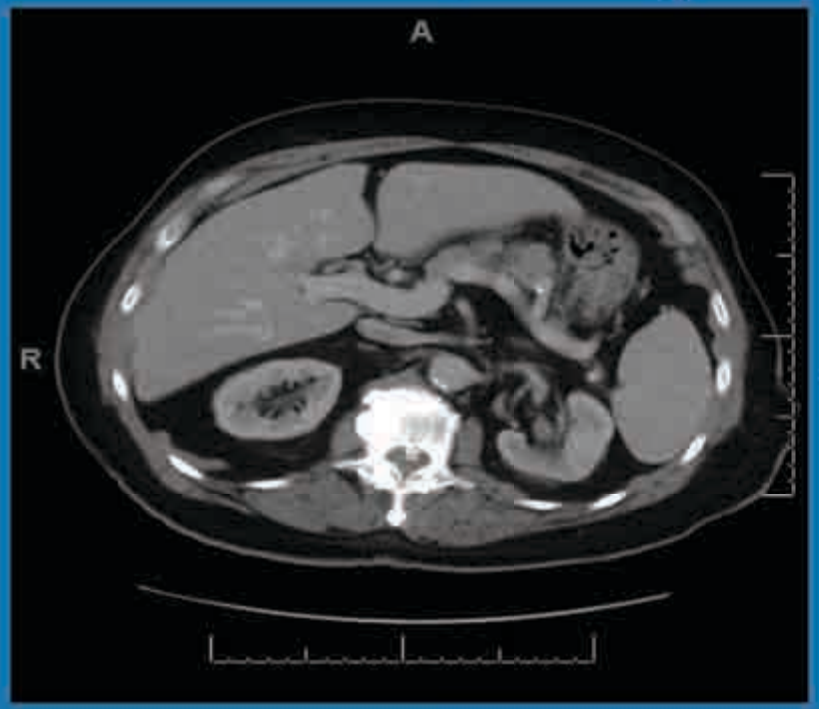




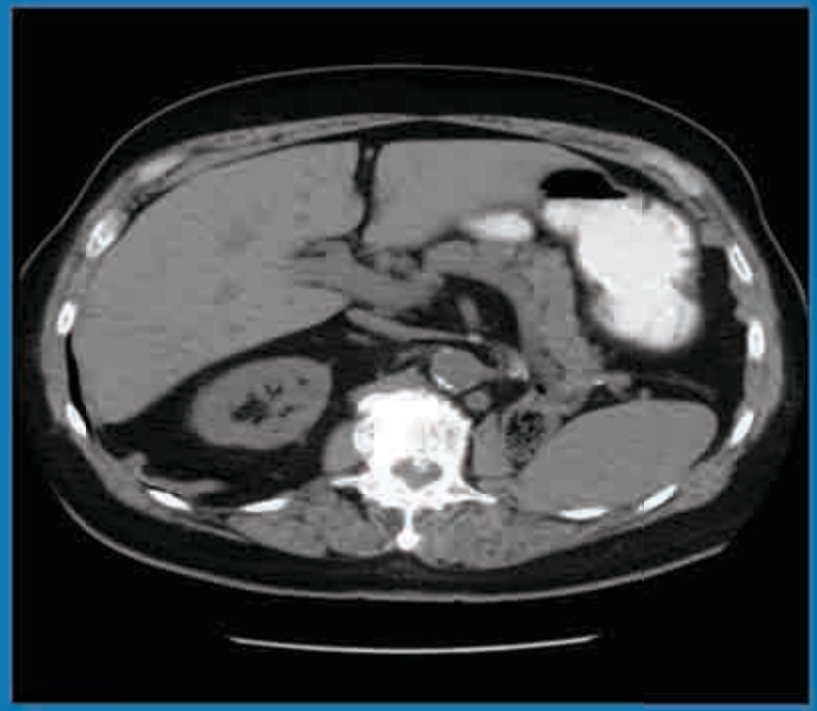
7 months post nephrectomy



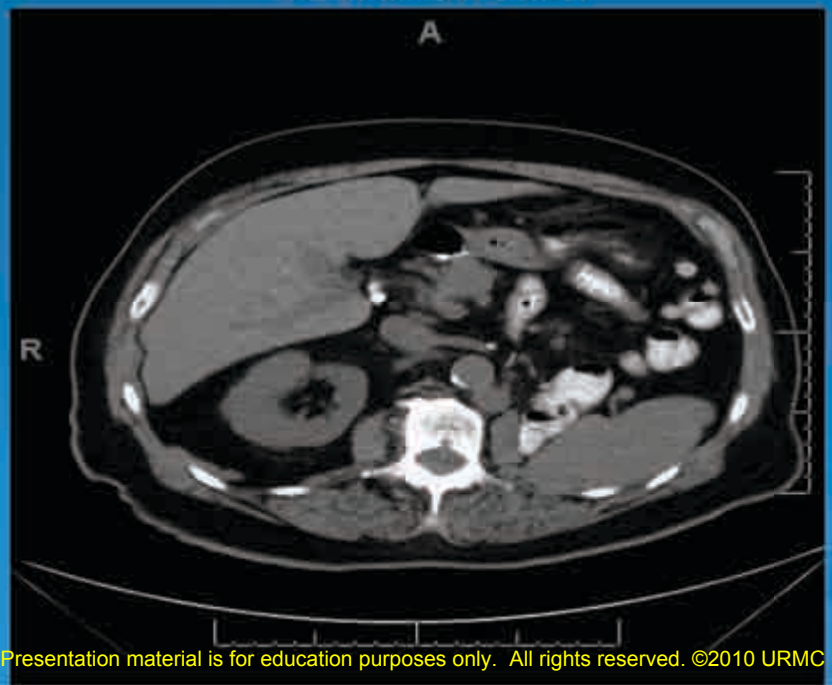
Before nephrectomy



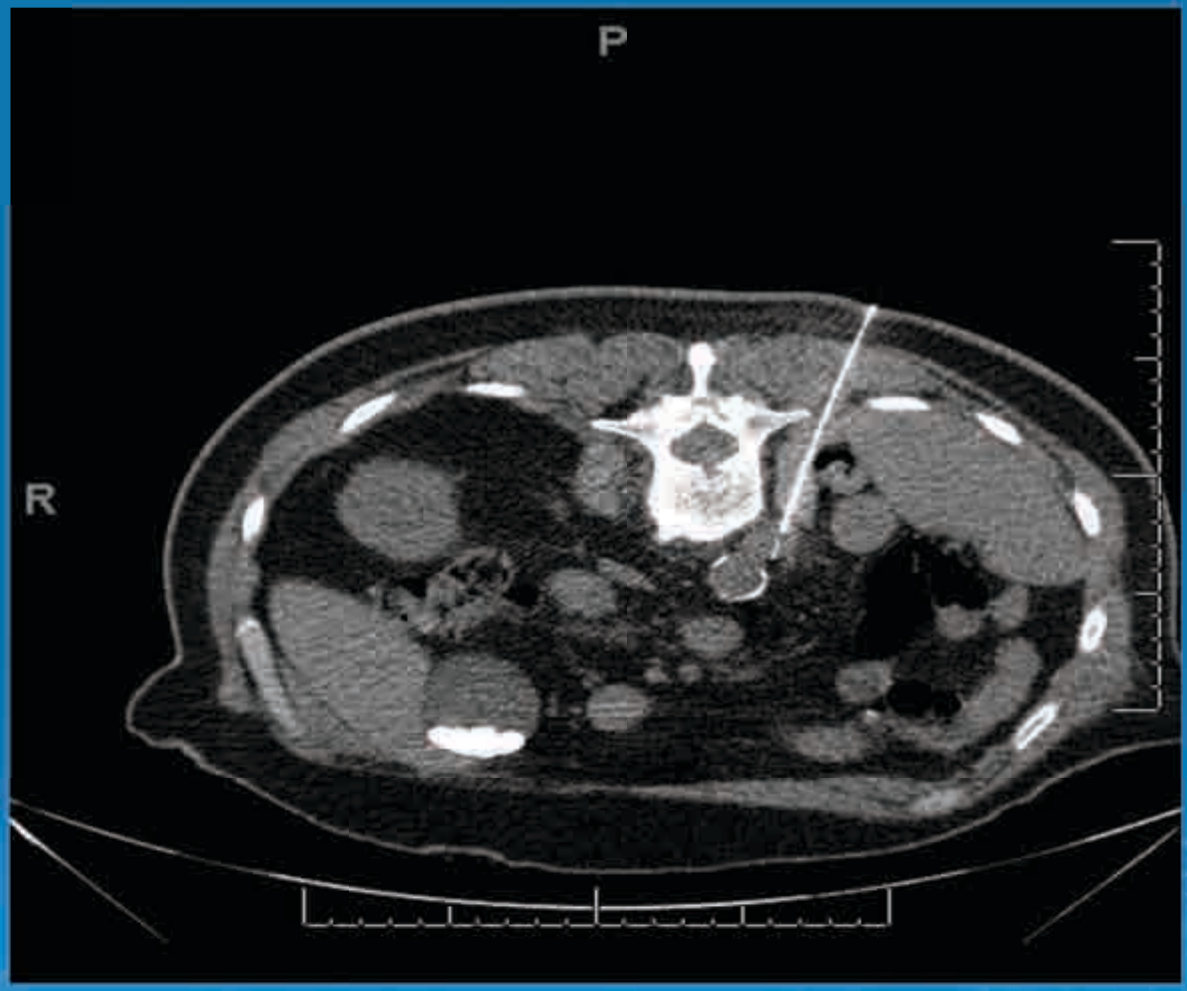
7 months out



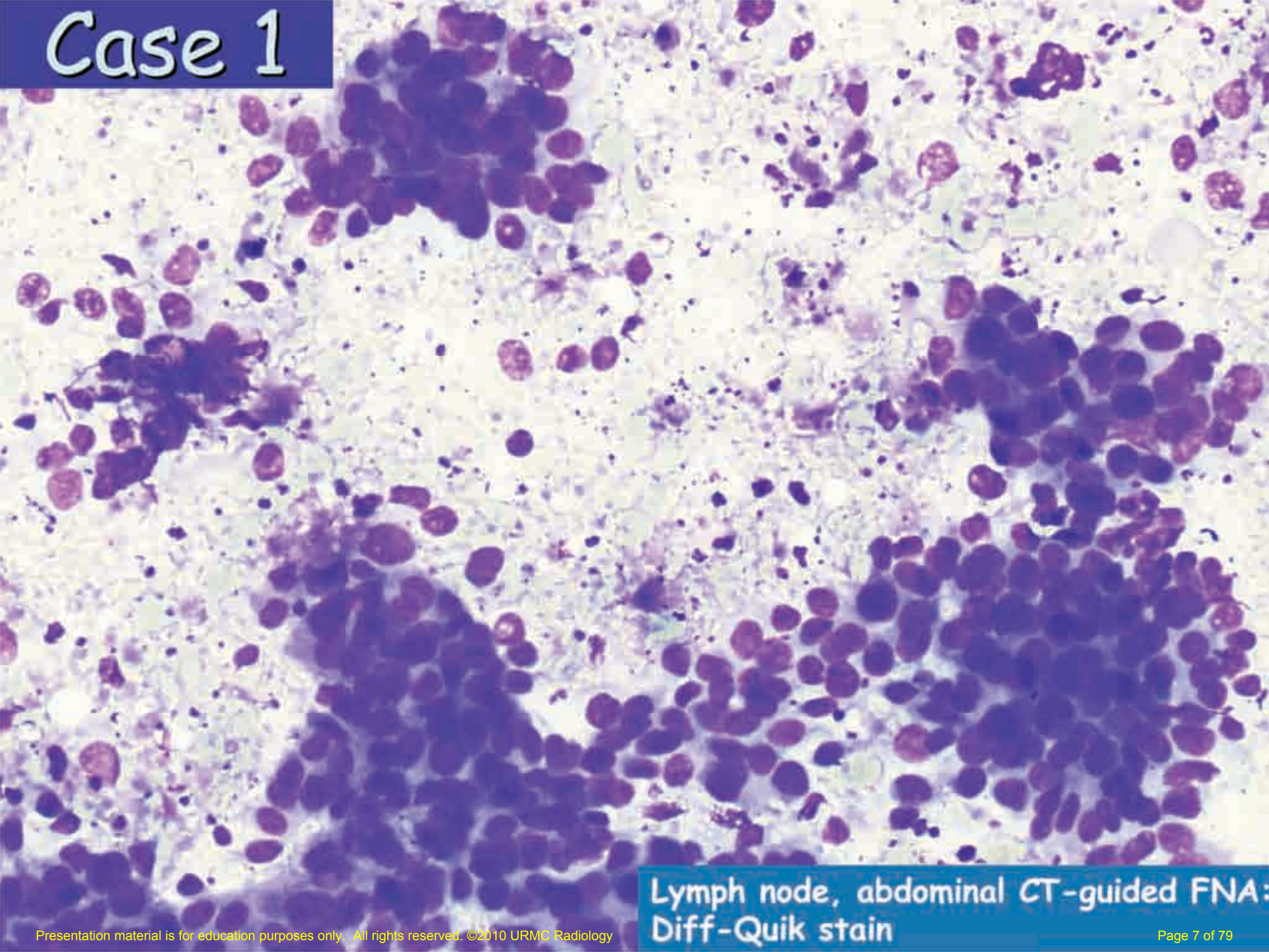
15 months out



Biopsy – would you be worried?

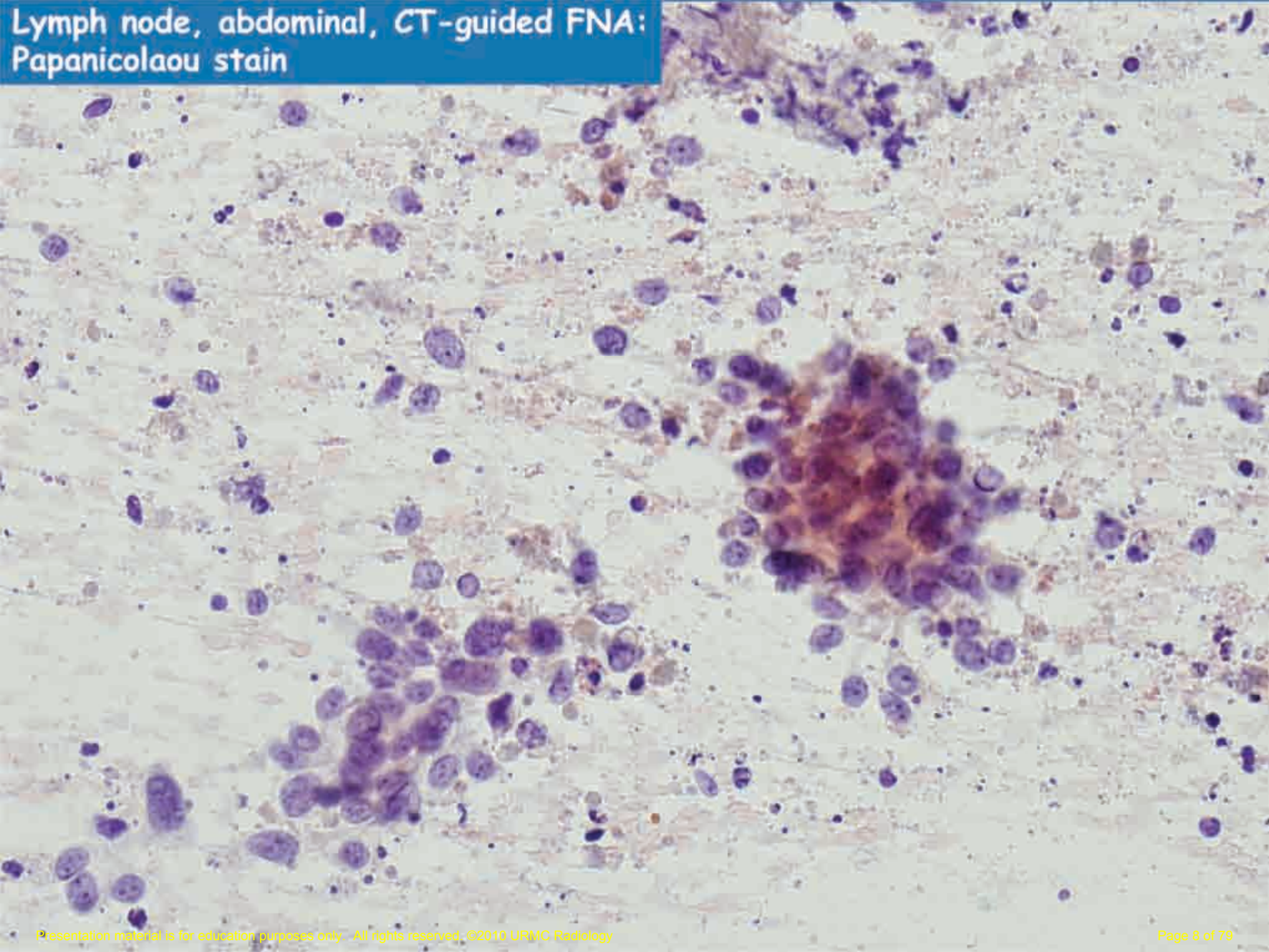


Case 1

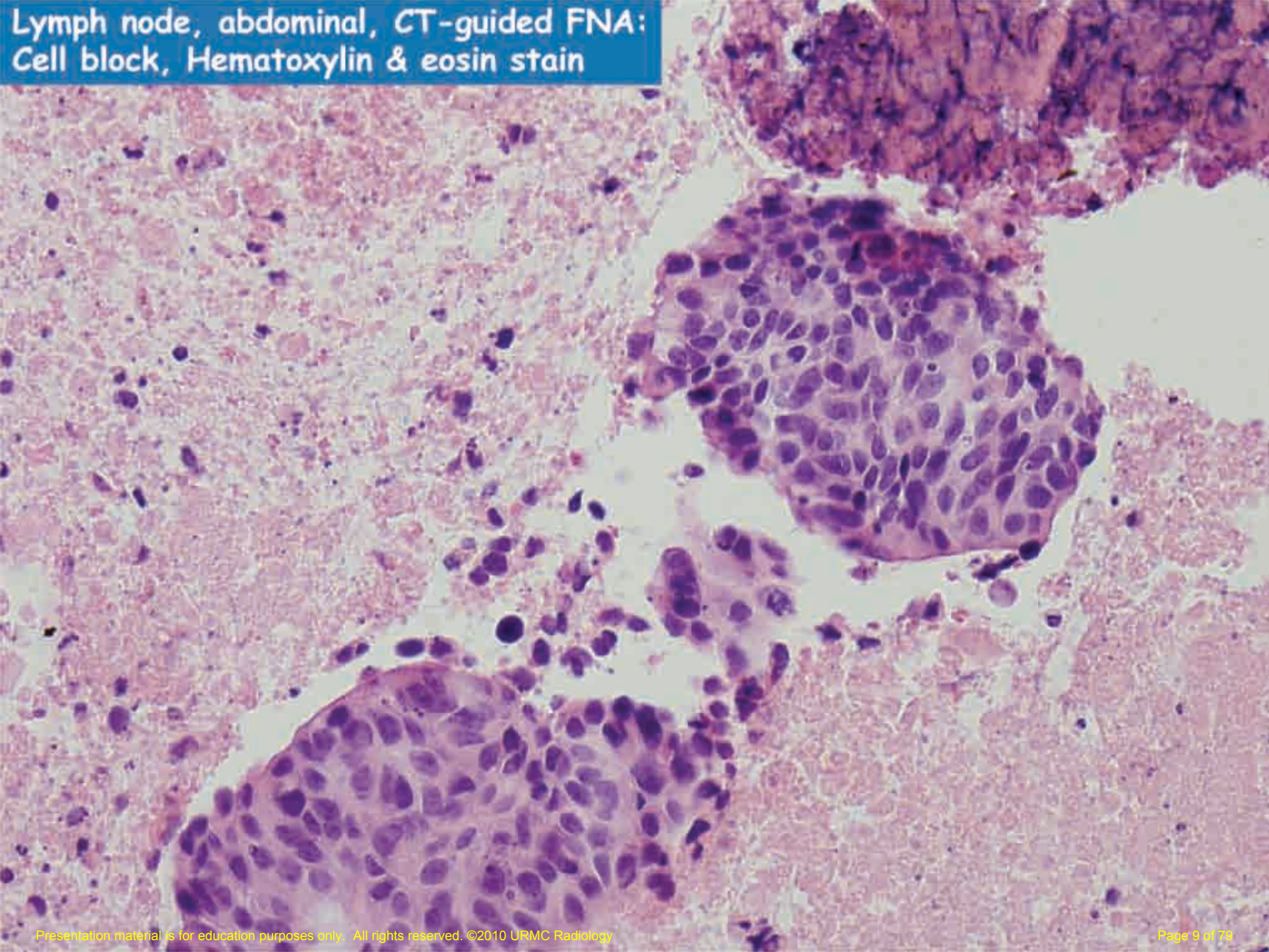


Lymph node, abdominal CT-guided FNA:
Diff-Quik stain

Lymph node, abdominal, CT-guided FNA: Papanicolaou stain



Lymph node, abdominal, CT-guided FNA:
Cell block, Hematoxylin & eosin stain



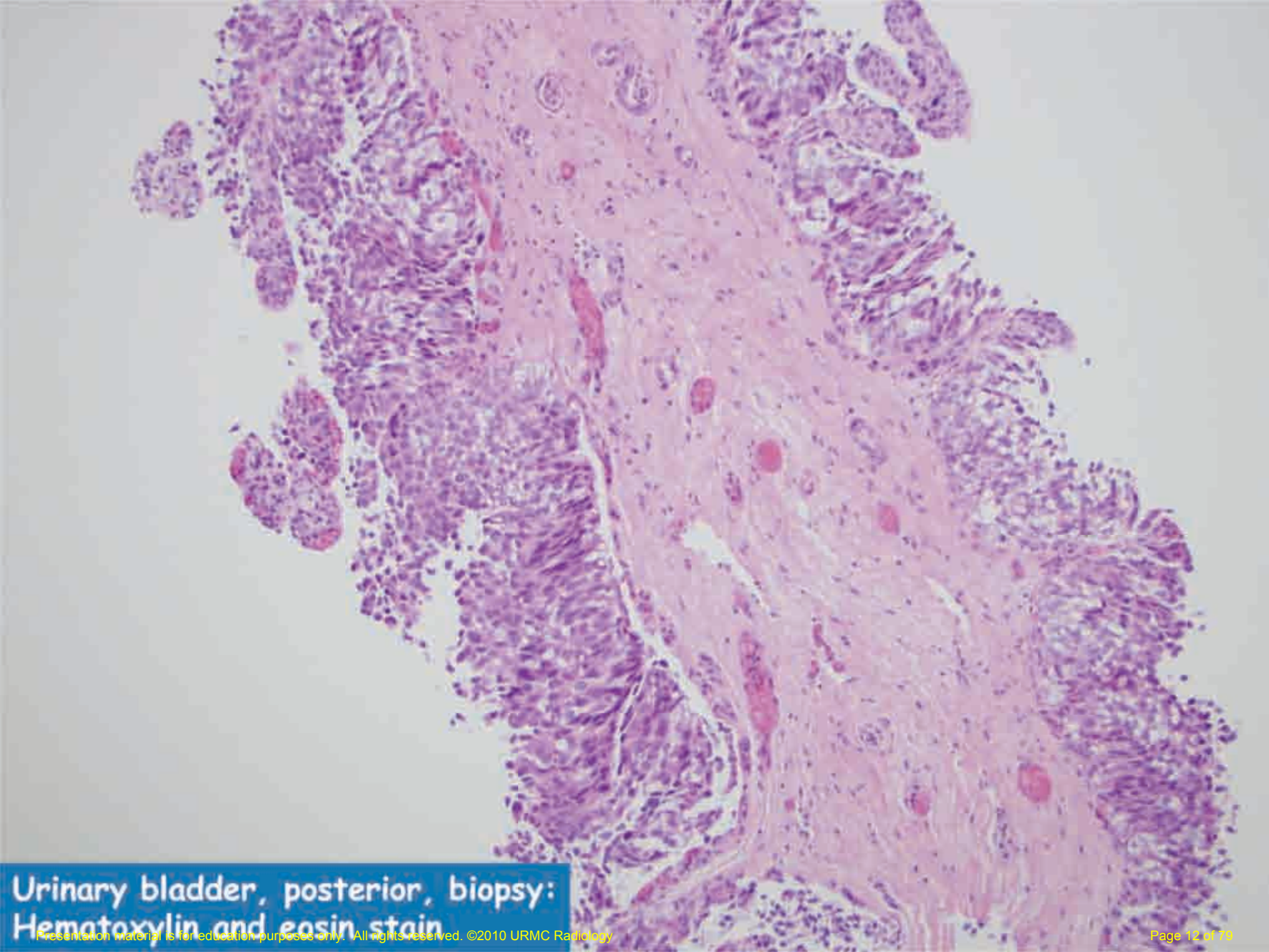
Lymph node, abdominal, CT-guided fine needle aspiration:

Malignant tumor cells present consistent with metastatic high grade urothelial carcinoma

Cell block and cytologic preparations examined

Urinary bladder, posterior, biopsy:

- Non-invasive high grade papillary urothelial carcinoma



Urinary bladder, posterior, biopsy:
Hematoxylin and eosin stain

Kidney and ureter, left, complete nephroureterectomy,

Kidney:

Invasive papillary urothelial carcinoma, high grade

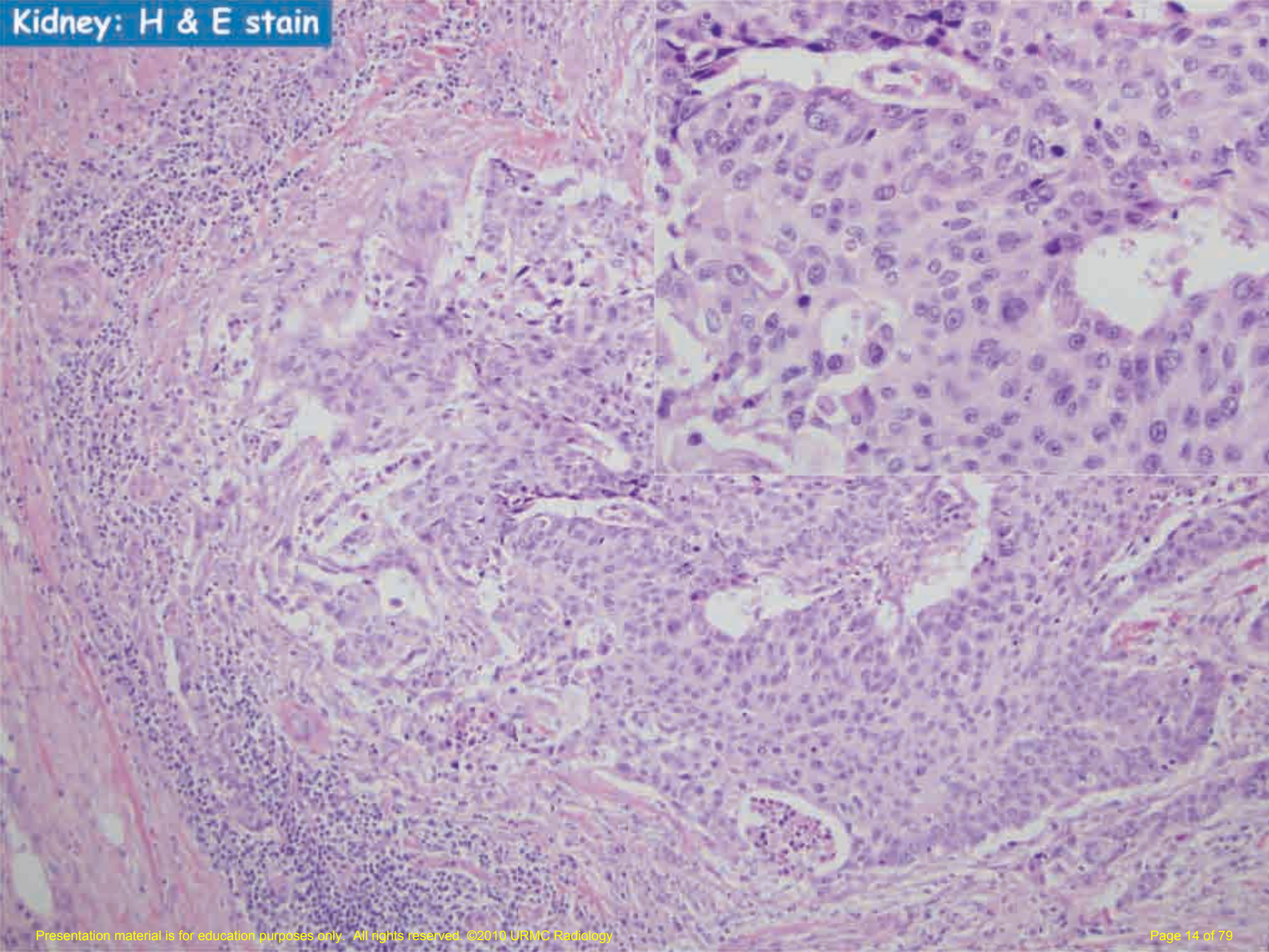
- Tumor size: 5 cm
- Tumor invades renal parenchyma
- Margins: Uninvolved by carcinoma
- Lymphovascular invasion: Present, lymphatic and large vein

Ureter:

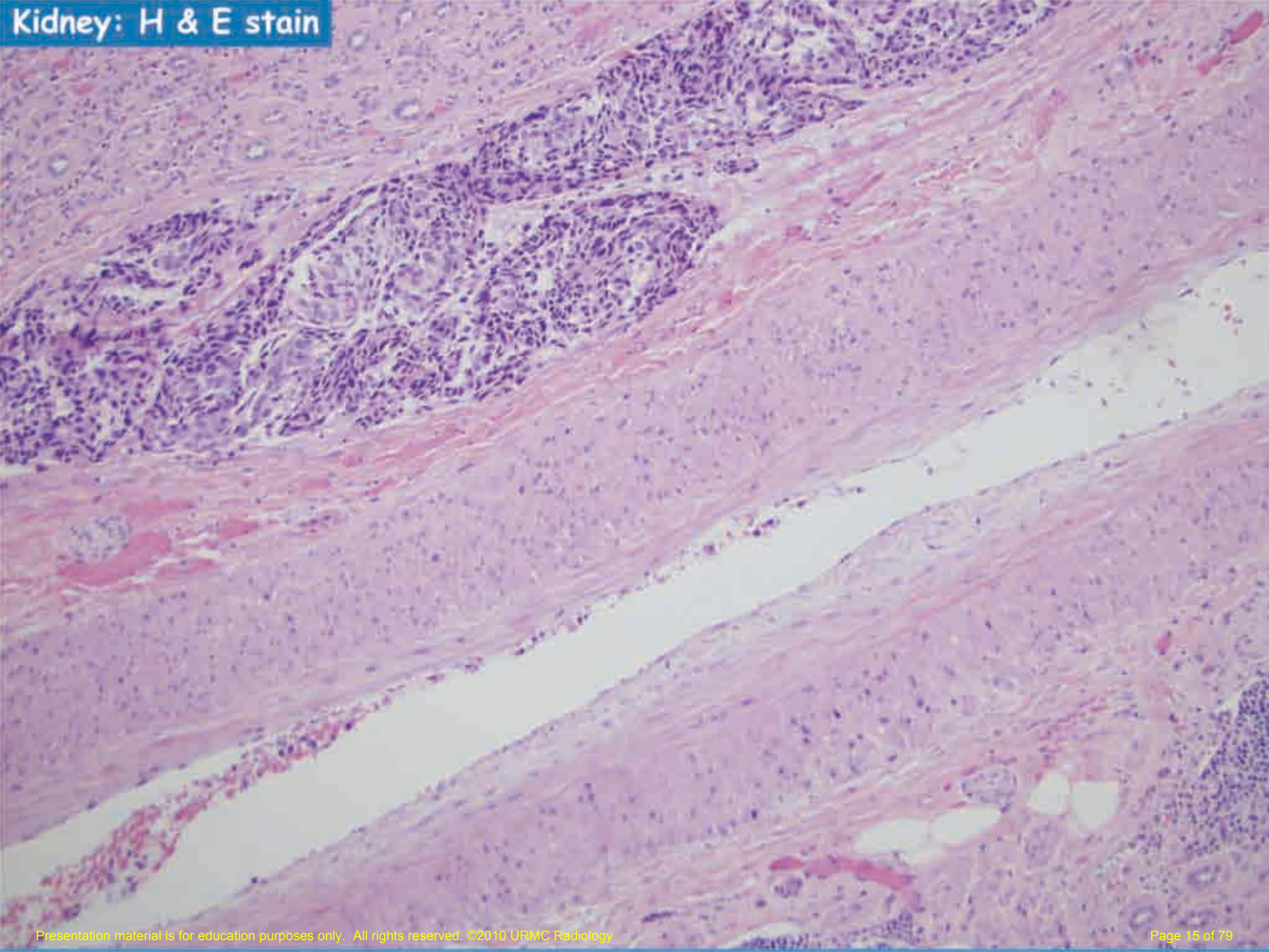
High grade papillary urothelial carcinoma, non-invasive

- Tumor size: 1.5 cm
- Margins: Tumor is 1.2 cm from distal resection margin
- Lymphovascular invasion: Not identified

Kidney: H & E stain



Kidney: H & E stain



Metastatic Urothelial Carcinoma

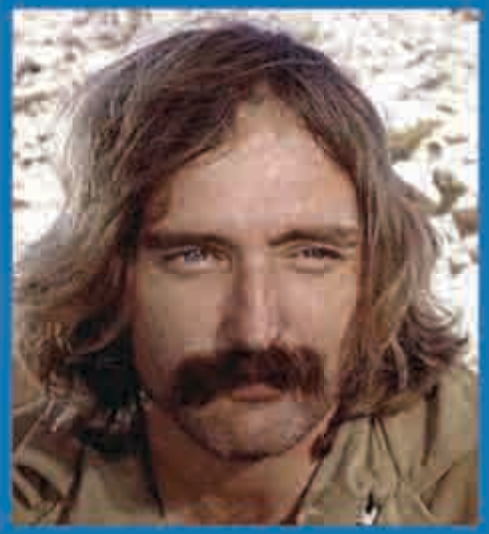
- 80-90% of bladder tumors are urothelial carcinomas
- Experts believe the majority of tumors result from environmental factors
- Low-grade tumors have excellent long-term prognosis, high grade tumors usually progress; 85-90% of urothelial neoplasm deaths occur in patients who present with high-grade tumors

Take home Rad messages

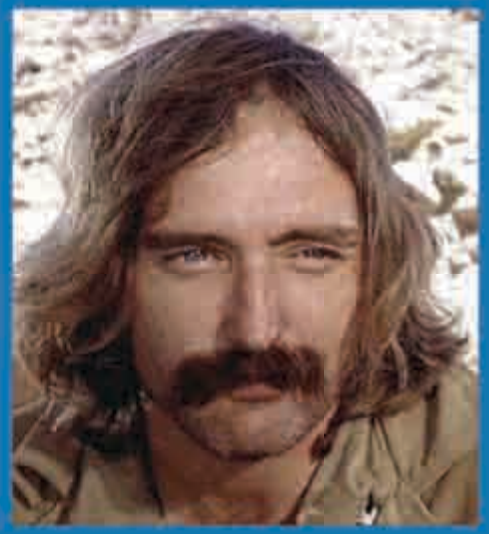
- Transitional cell carcinoma accounts for more than 90% of renal pelvic tumors.

- If you have a Scottish terrier, screen for hematuria!

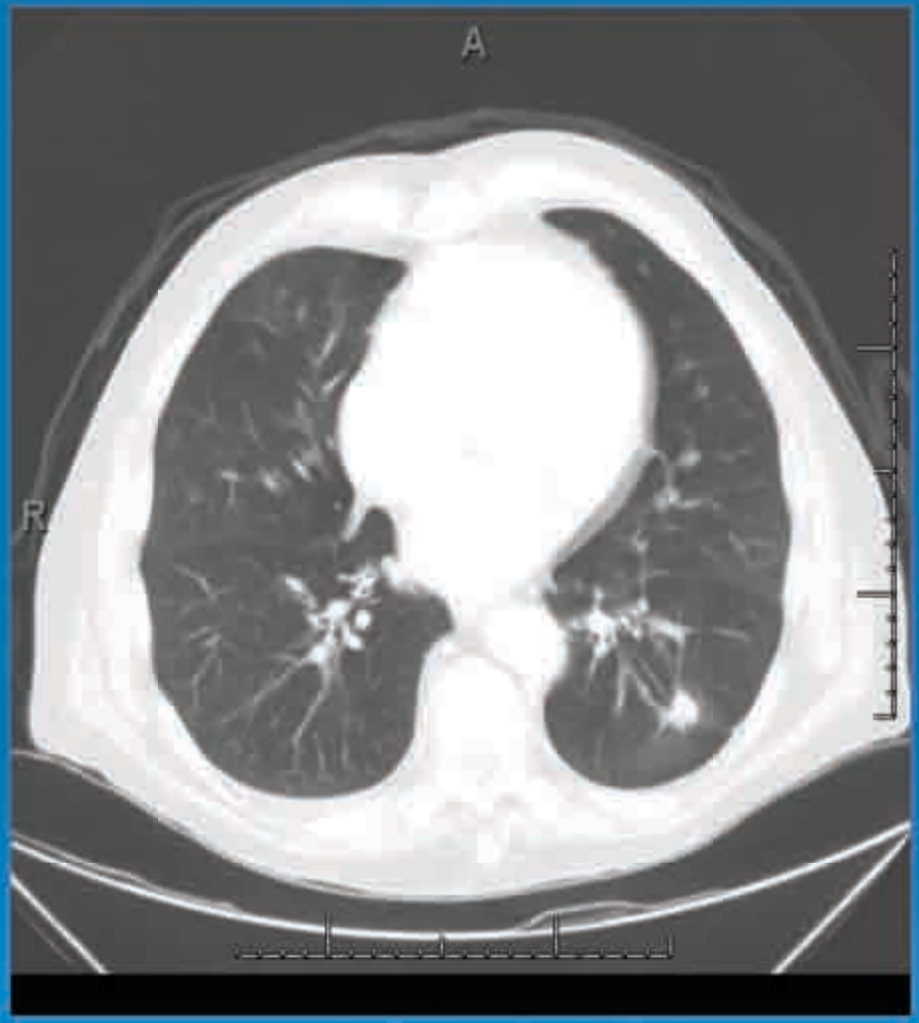
Case 2



Case 2

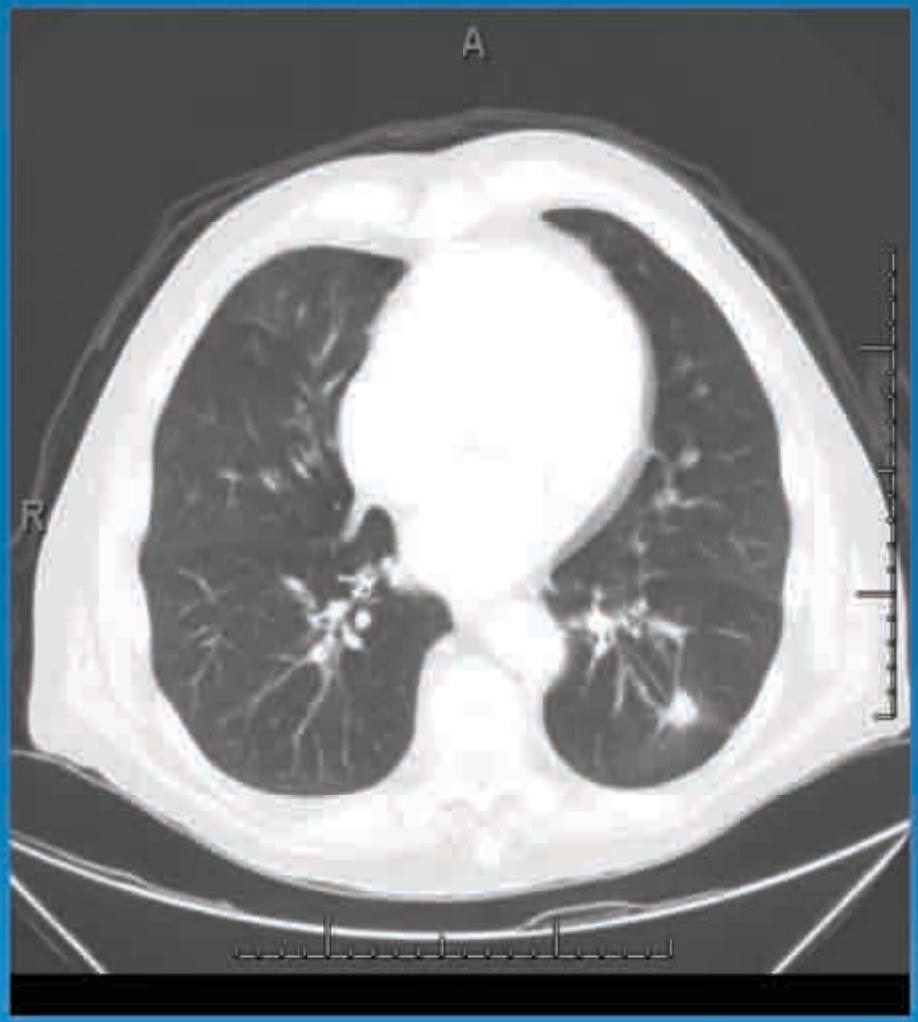


87 y/o male with h/o prostate CA

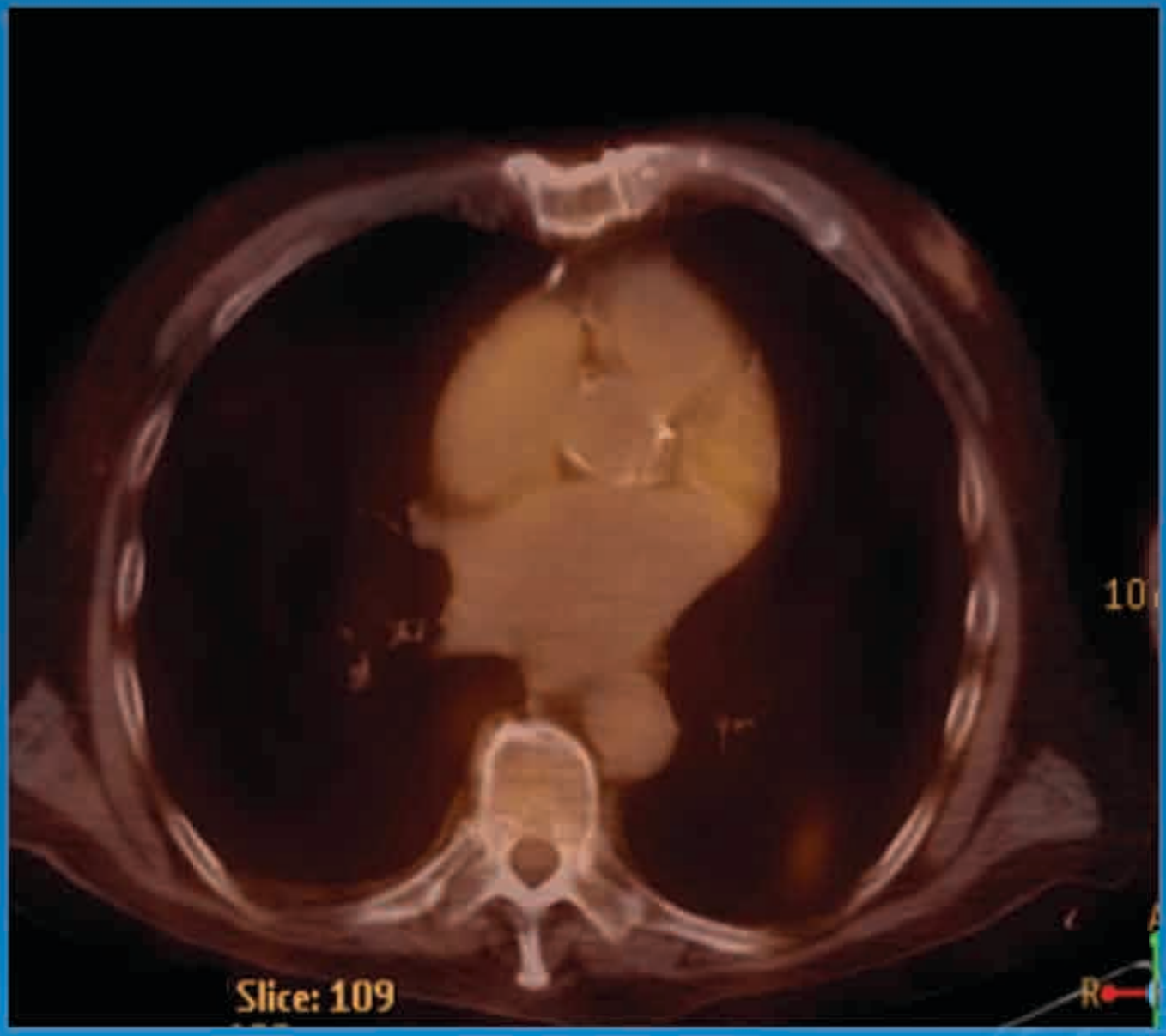


87 y/o male with h/o prostate CA

Currently



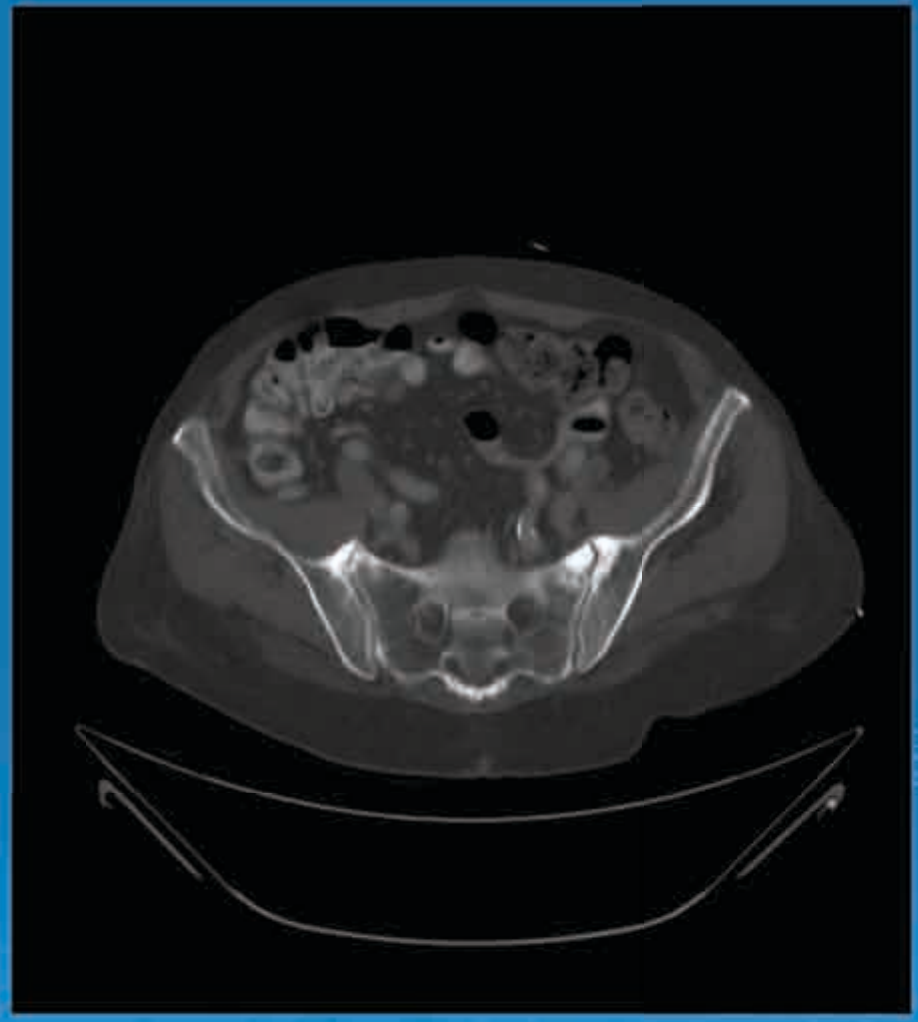
15 months earlier



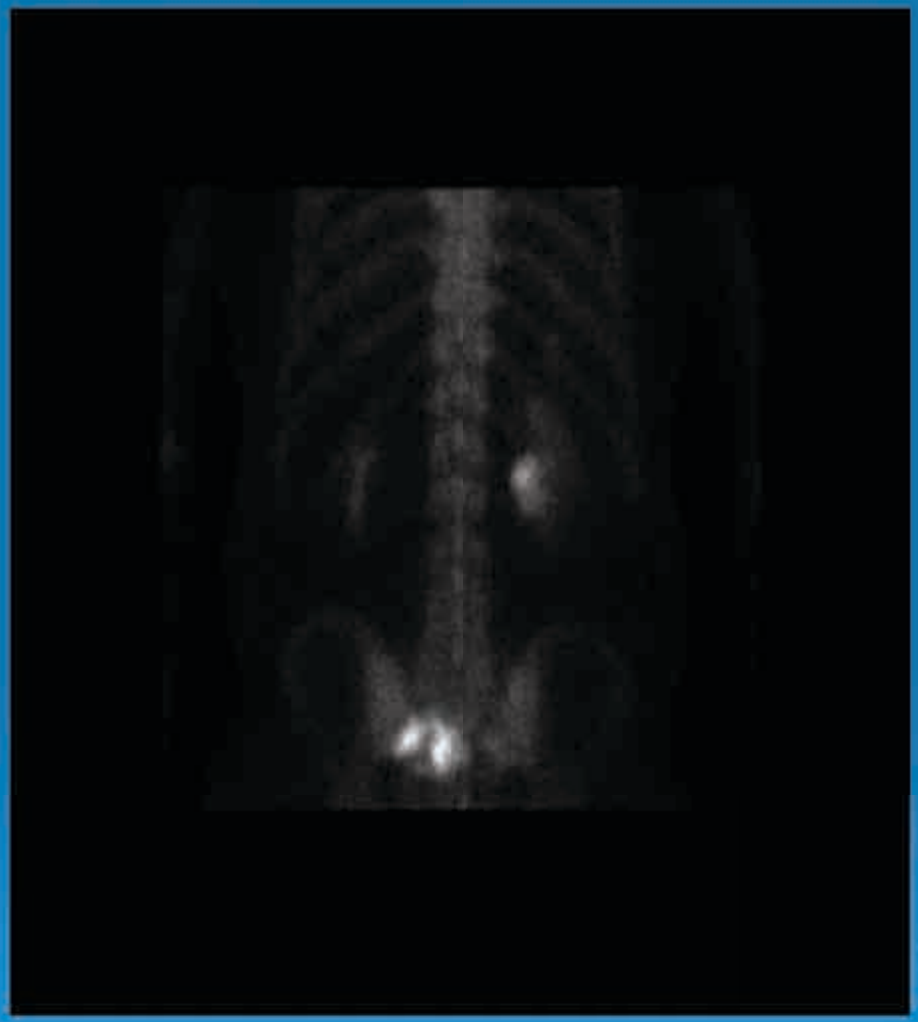
Currently

Currently

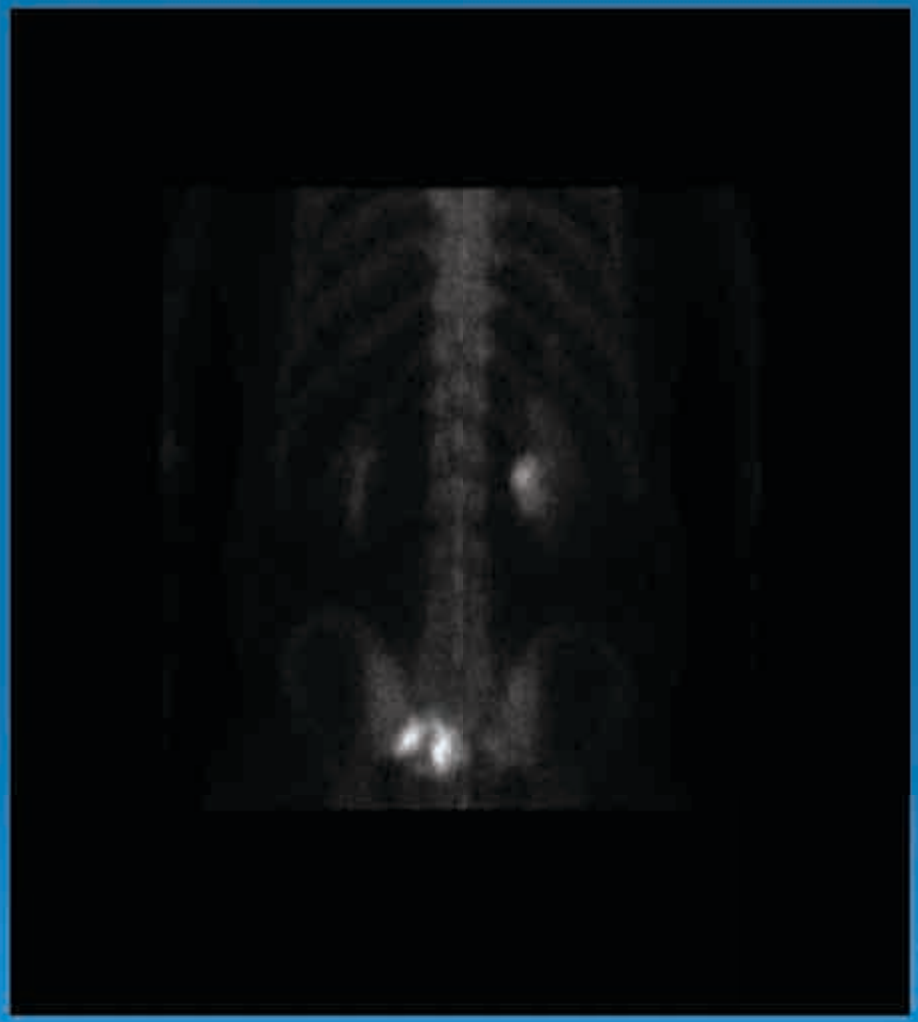
15 months earlier



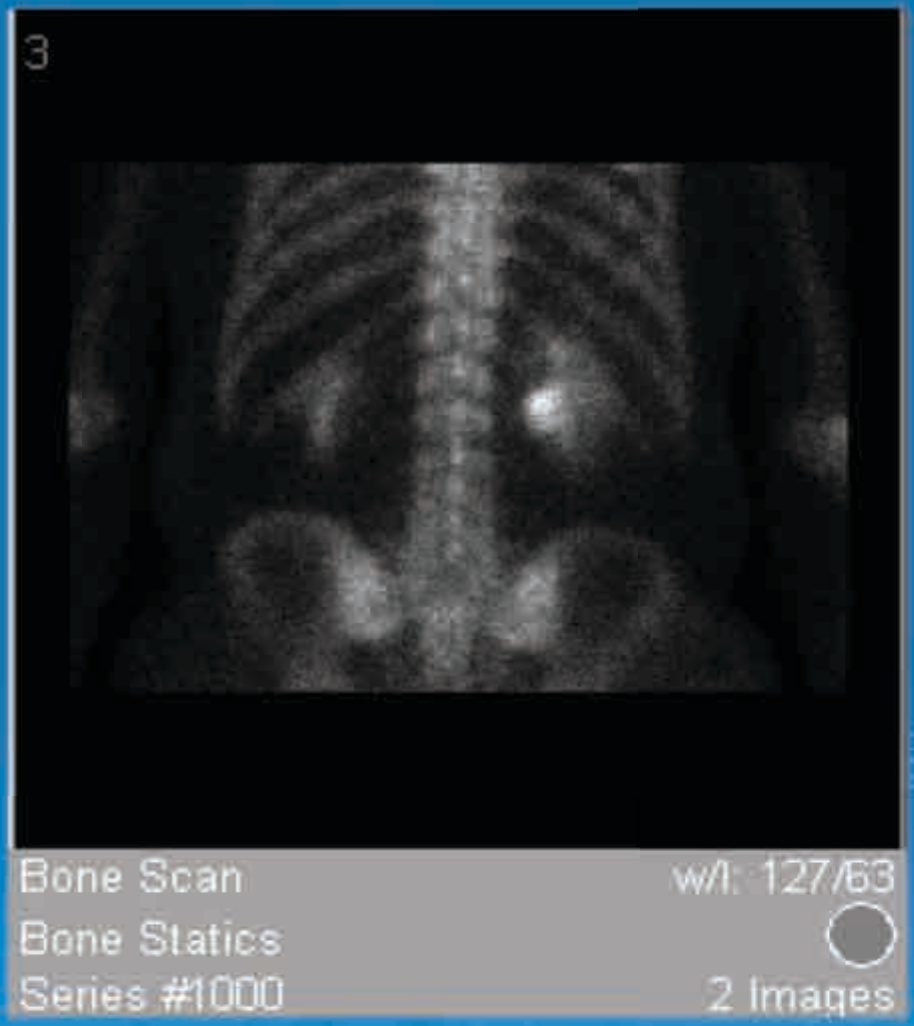
Currently



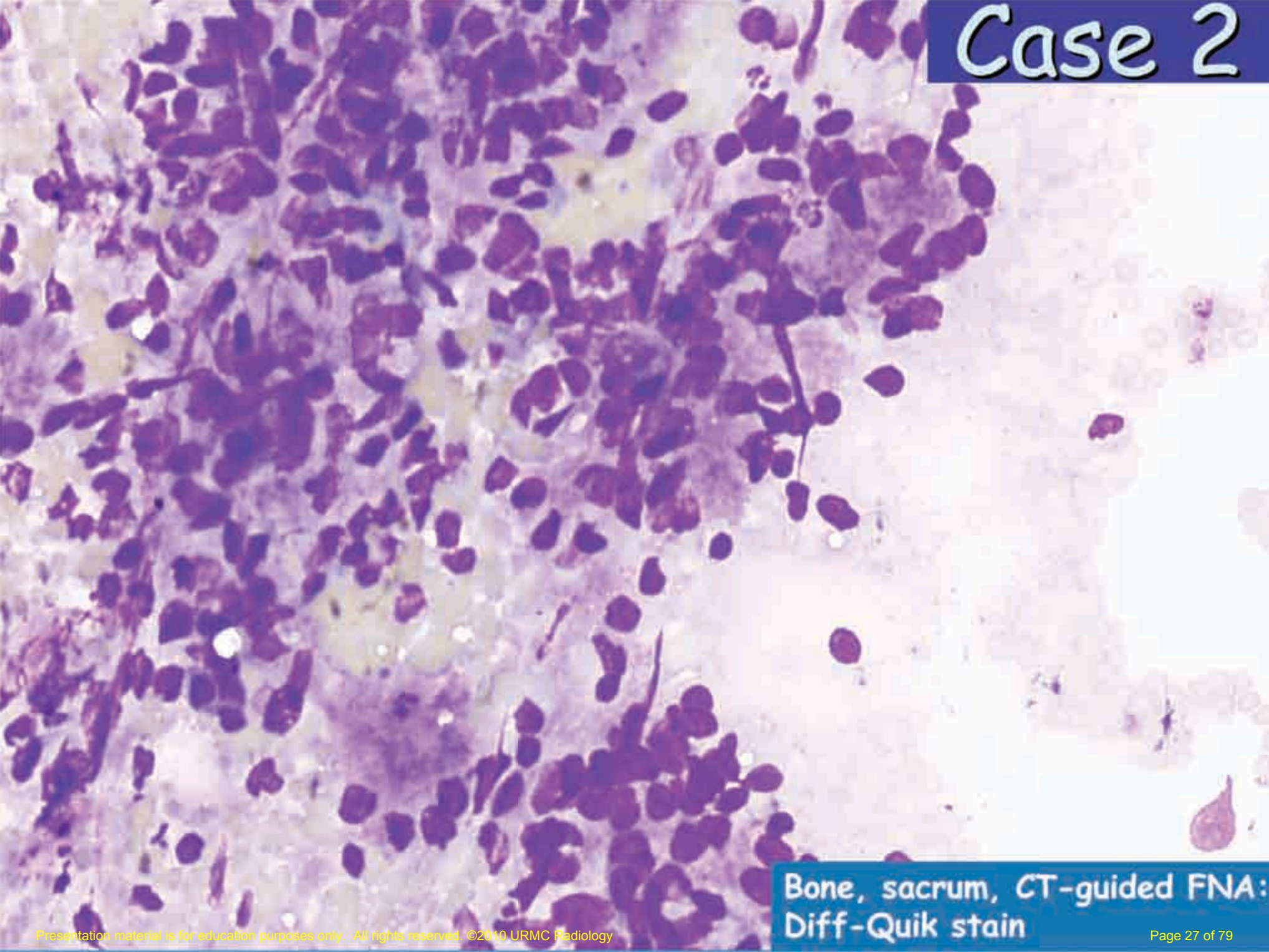
Currently



2 years ago

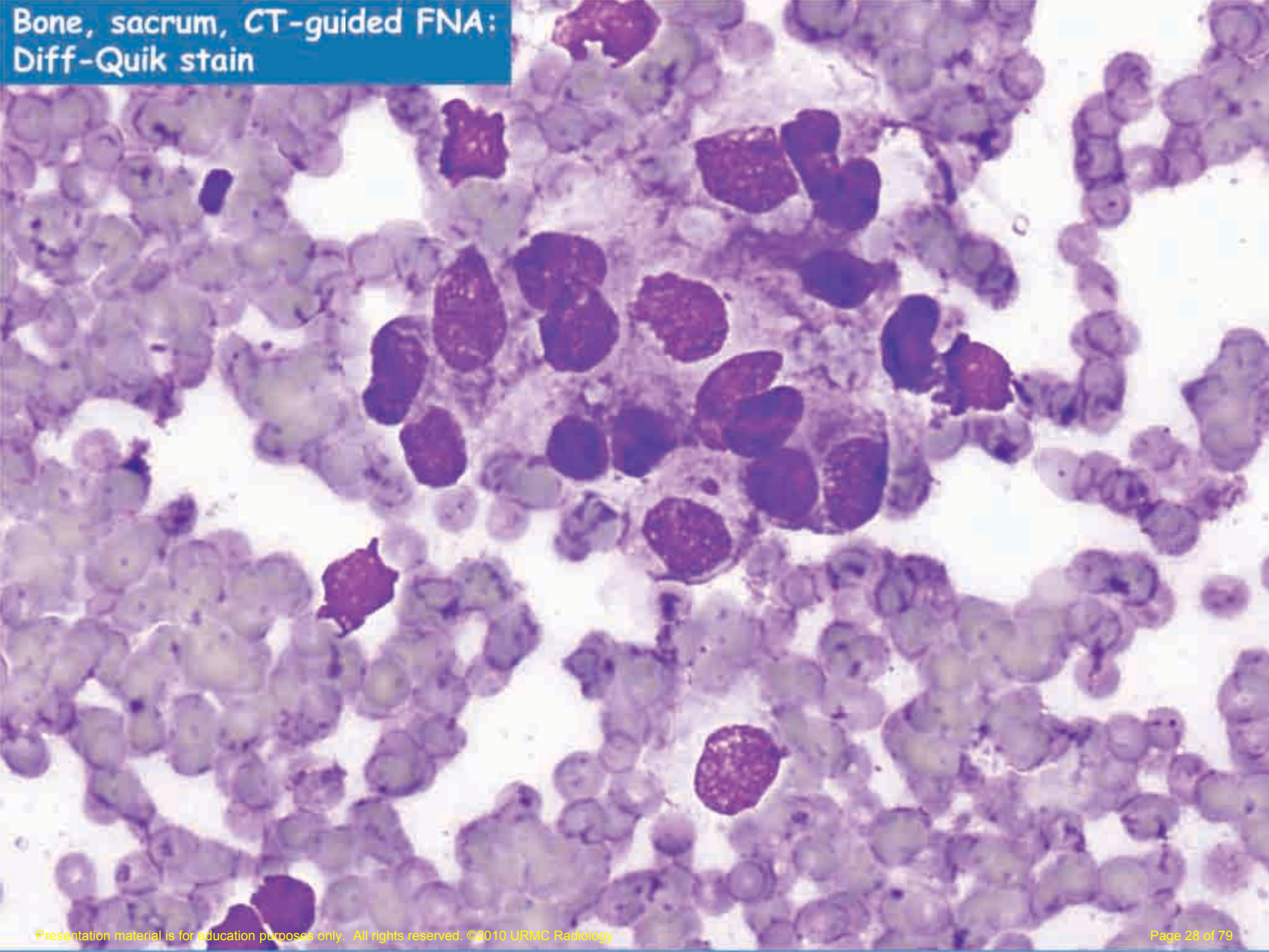


Case 2

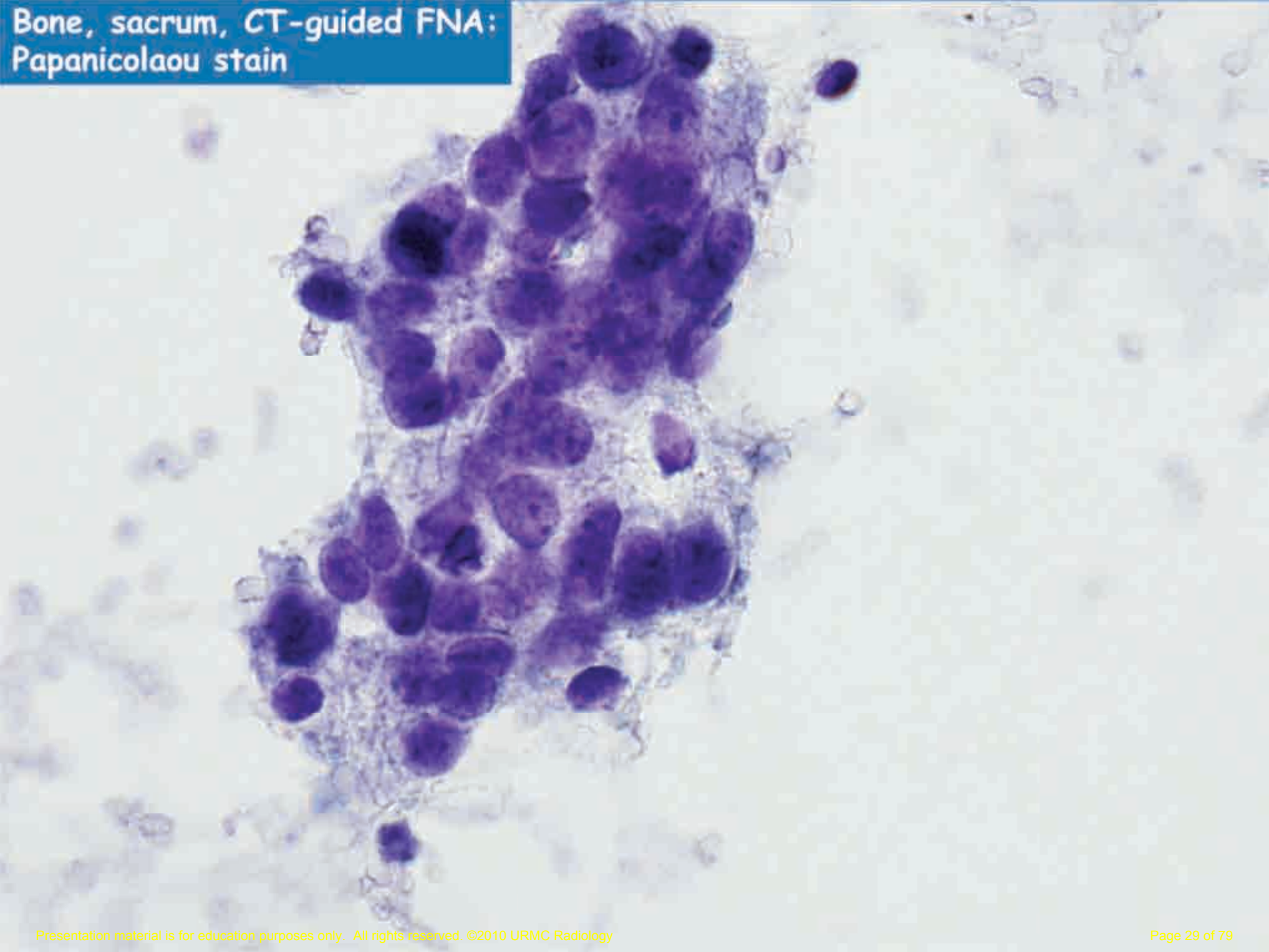


Bone, sacrum, CT-guided FNA:
Diff-Quik stain

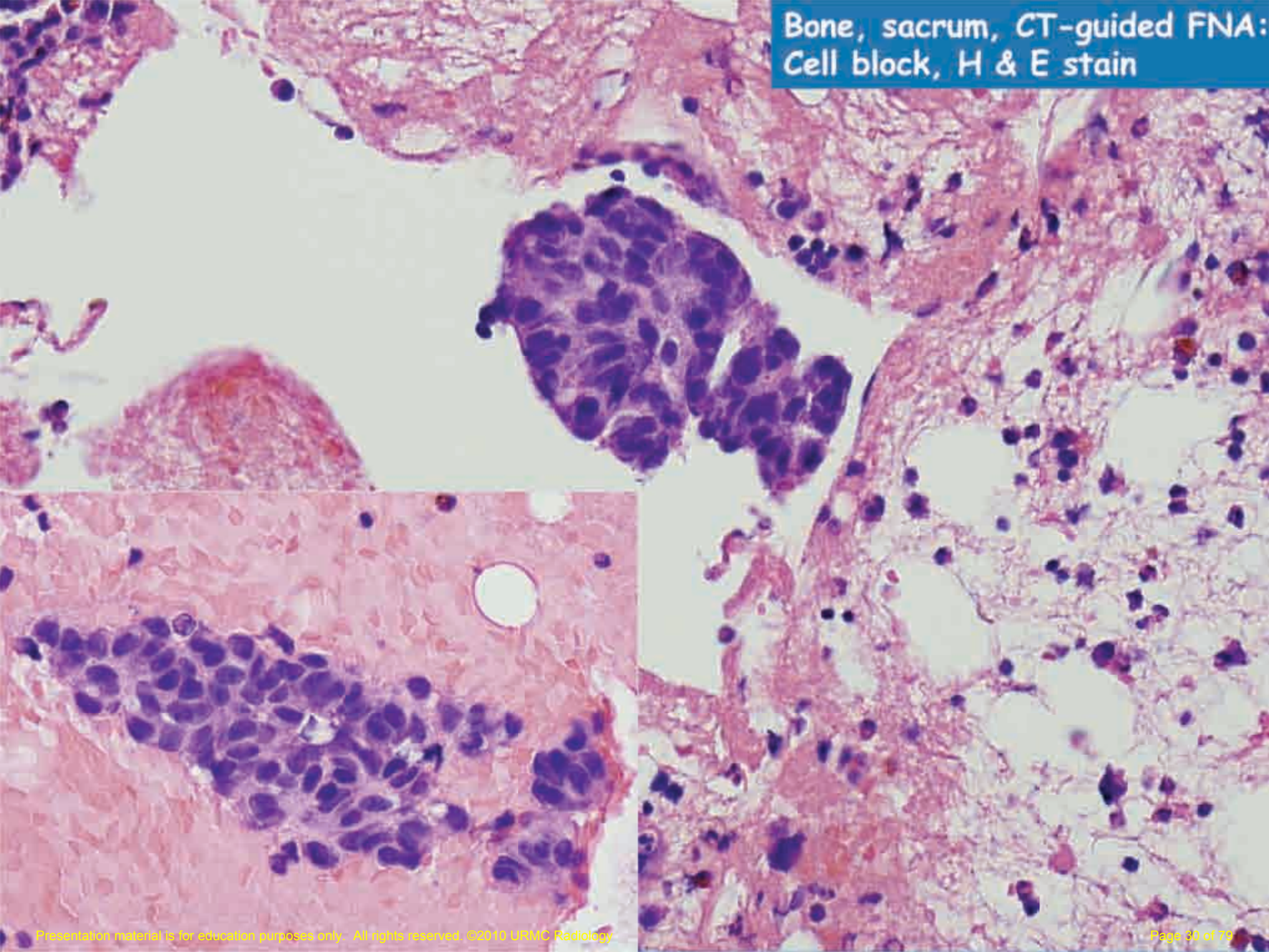
Bone, sacrum, CT-guided FNA:
Diff-Quik stain



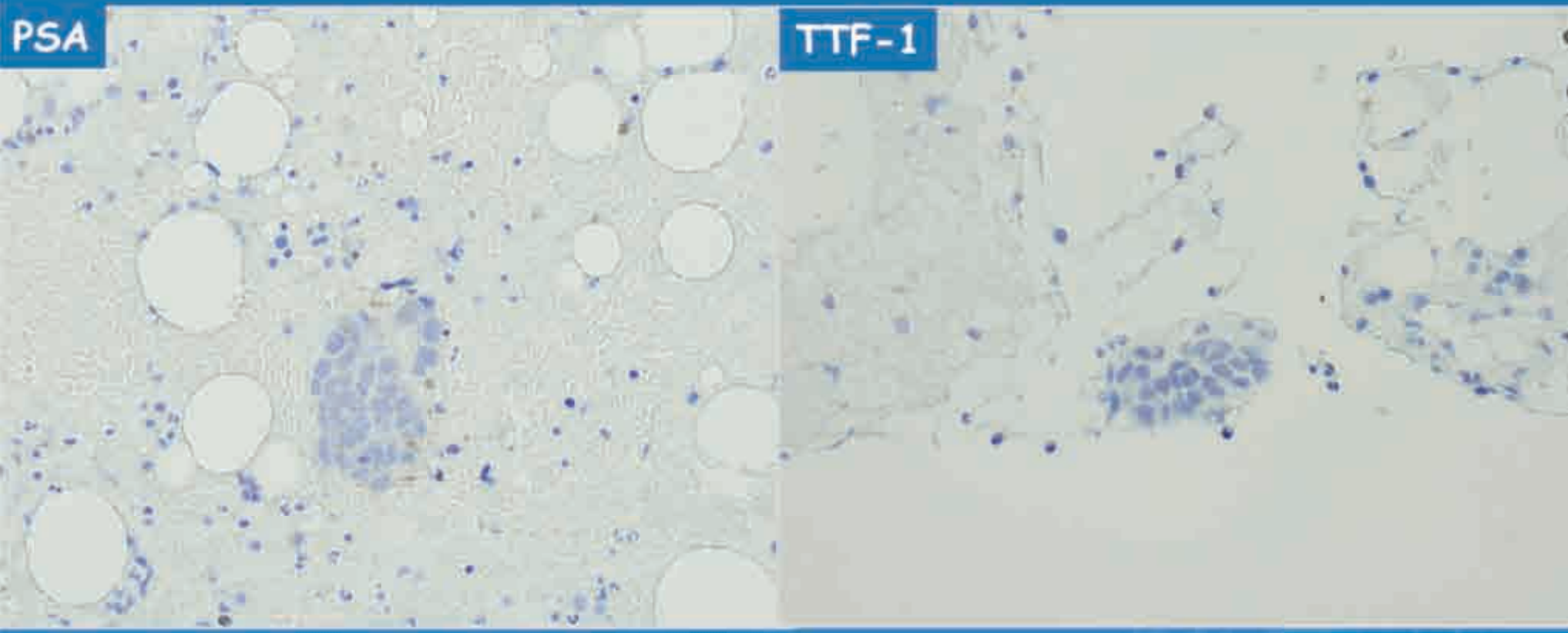
Bone, sacrum, CT-guided FNA: Papanicolaou stain



Bone, sacrum, CT-guided FNA: Cell block, H & E stain



Bone, sacrum, CT-guided FNA: Cell block, Immunostains



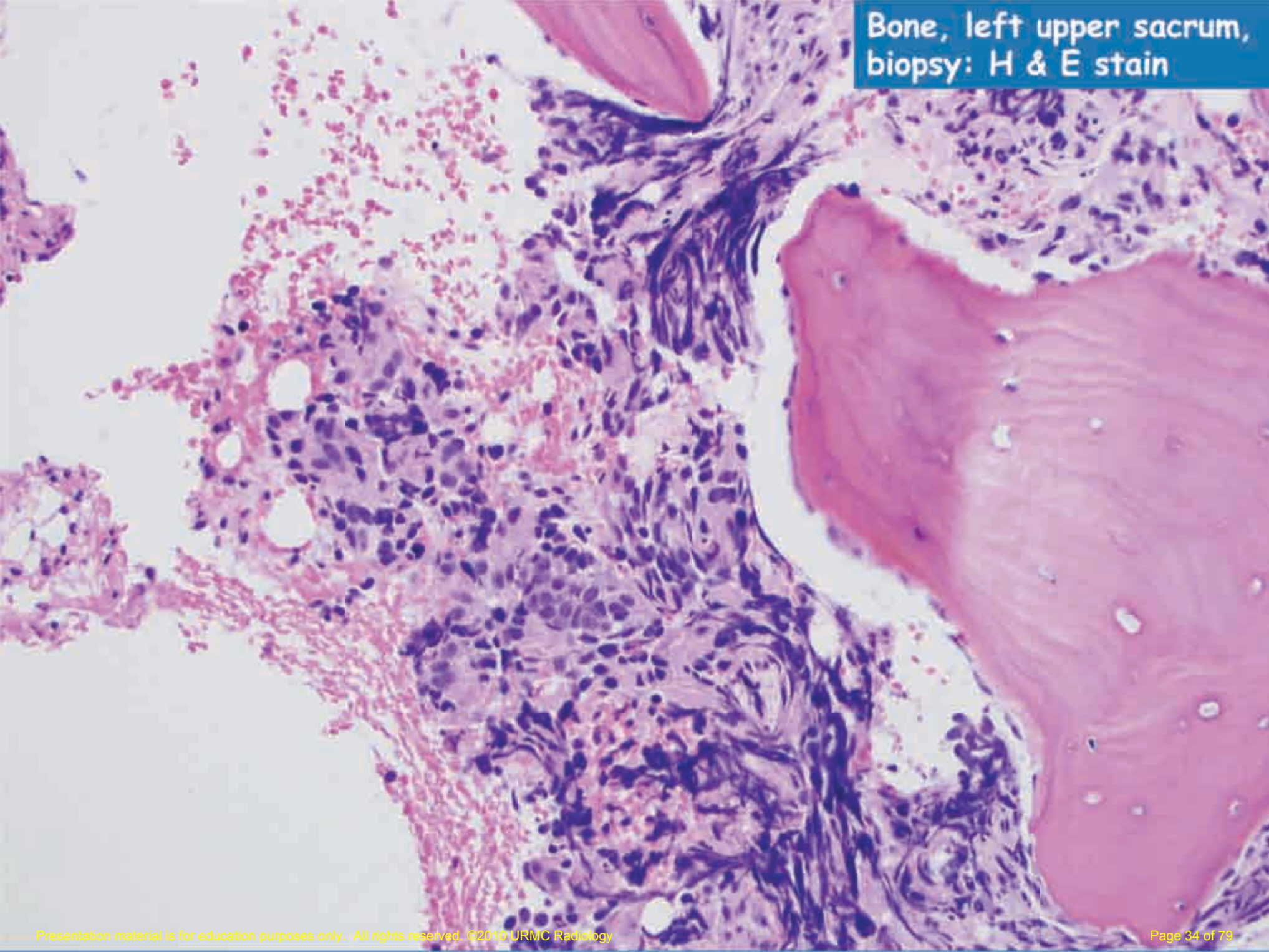
Bone, sacrum, CT-guided fine needle aspiration:

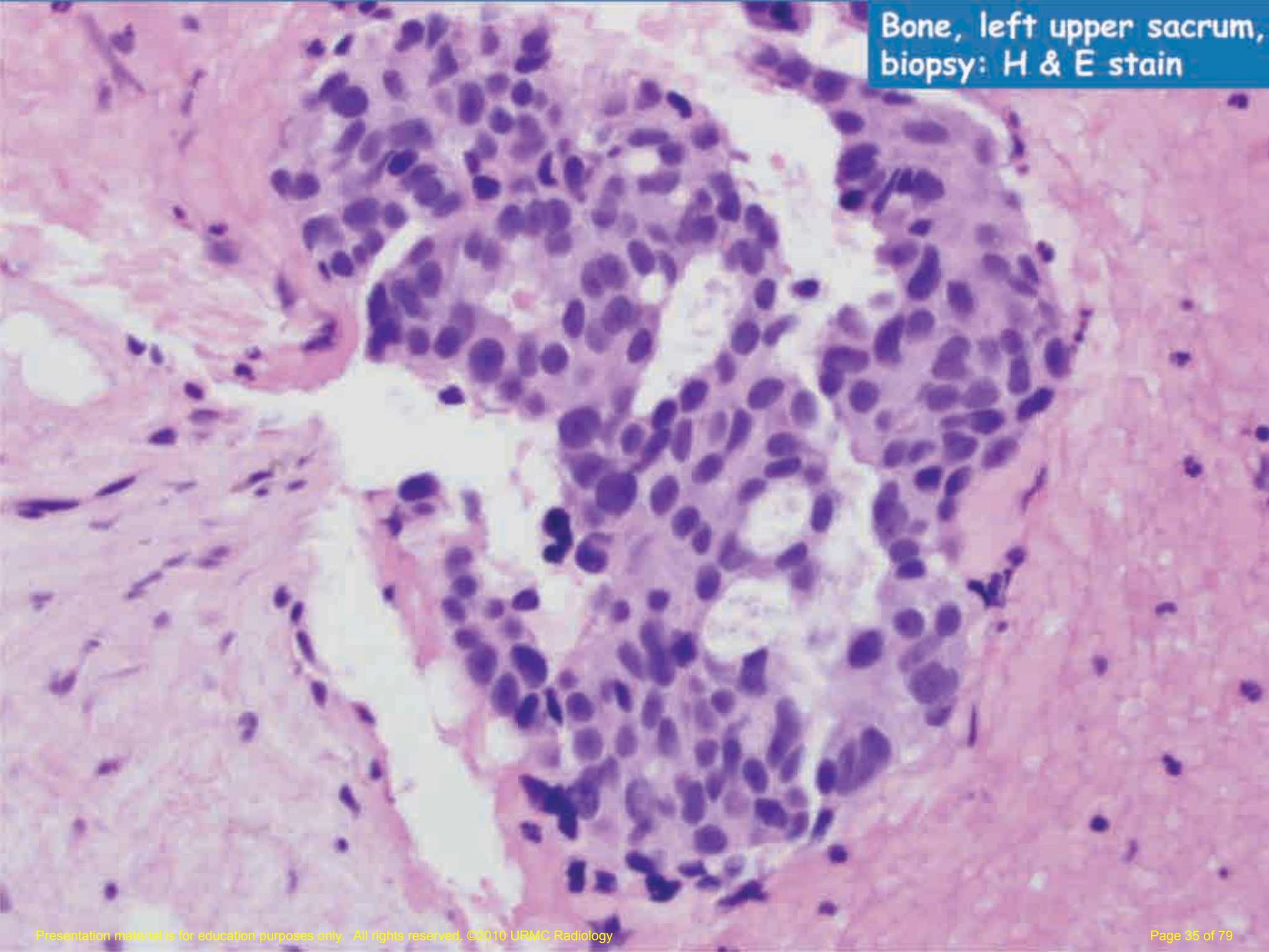
Malignant tumor cells present derived from metastatic adenocarcinoma

Cell block and cytologic preparations examined

Bone, left upper sacrum, biopsy:

Metastatic adenocarcinoma, consistent with prostate primary





Metastatic Adenocarcinoma - Prostate

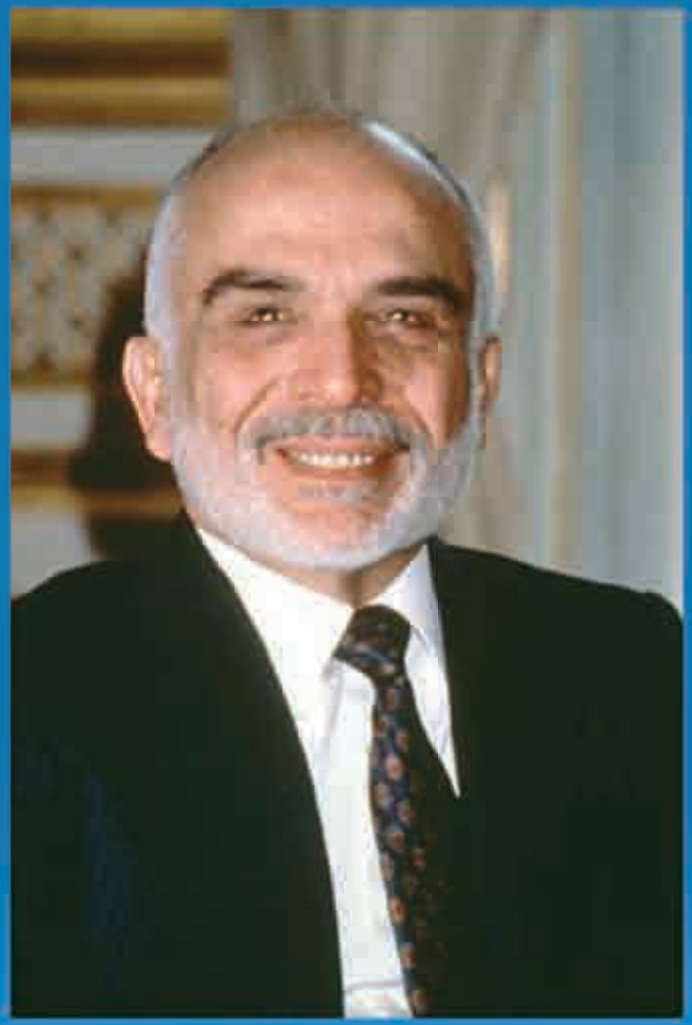
- Metastatic disease to bone - most common type of skeletal malignancy
- Studies have shown 85% patients with common visceral CAs have bone involvement
- Prostate carcinoma is 2nd leading cause of cancer death in American men; 6th leading cancer cause in men worldwide
- Most carcinoma metastases to bone originate from the prostate, breast, kidney and lungs
- Progressive pain, swelling and tenderness common symptoms of metastases

Take home Rad message

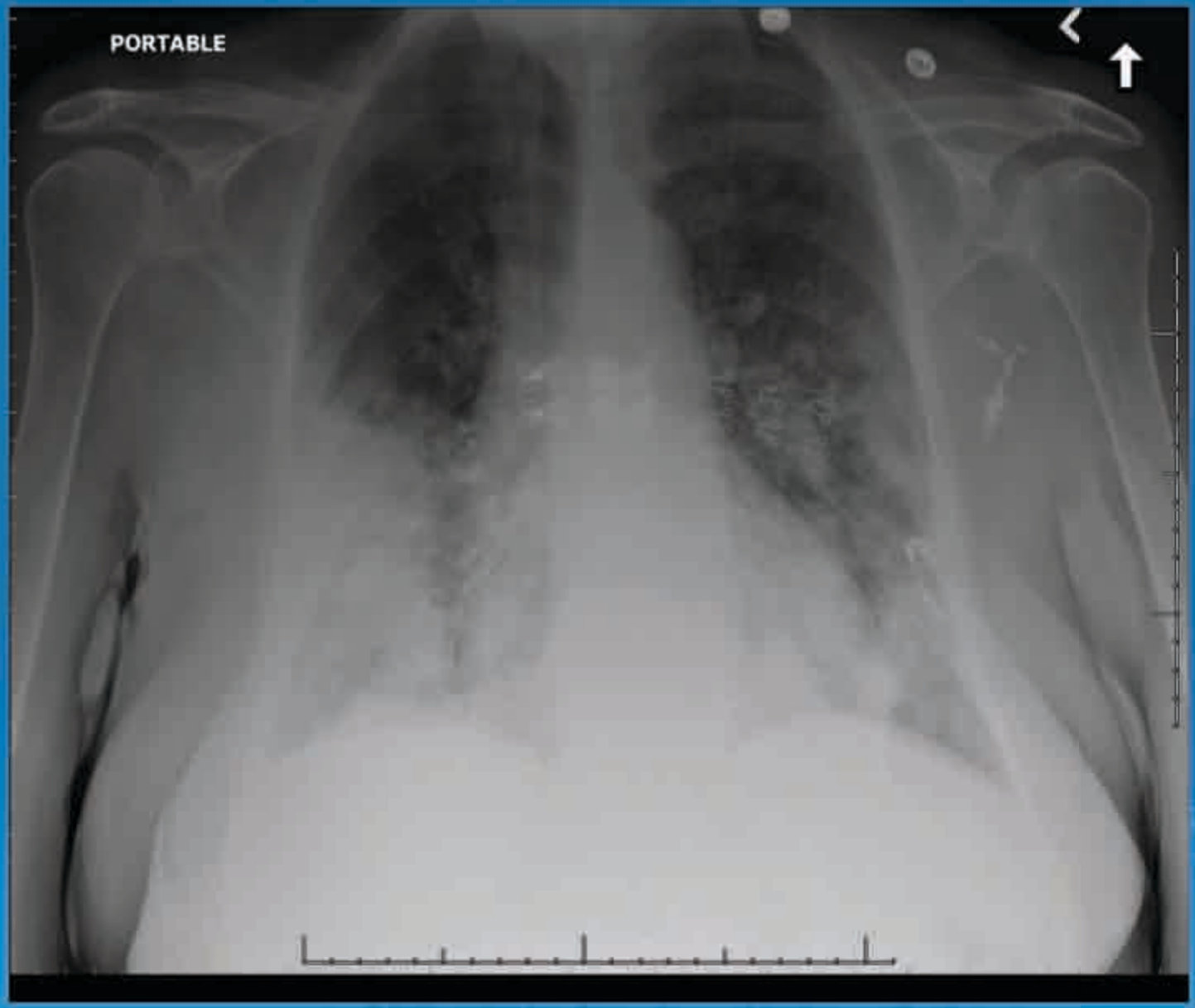
- Prostate metastases to lung.
- At Prostate CA presentation: 5% have lung mets
- At Autopsy: 15-50% have lung mets

- Go over the bones with a FINE TOOTH COMB, you will usually find a metastasis if there is a lung met.

Case 3

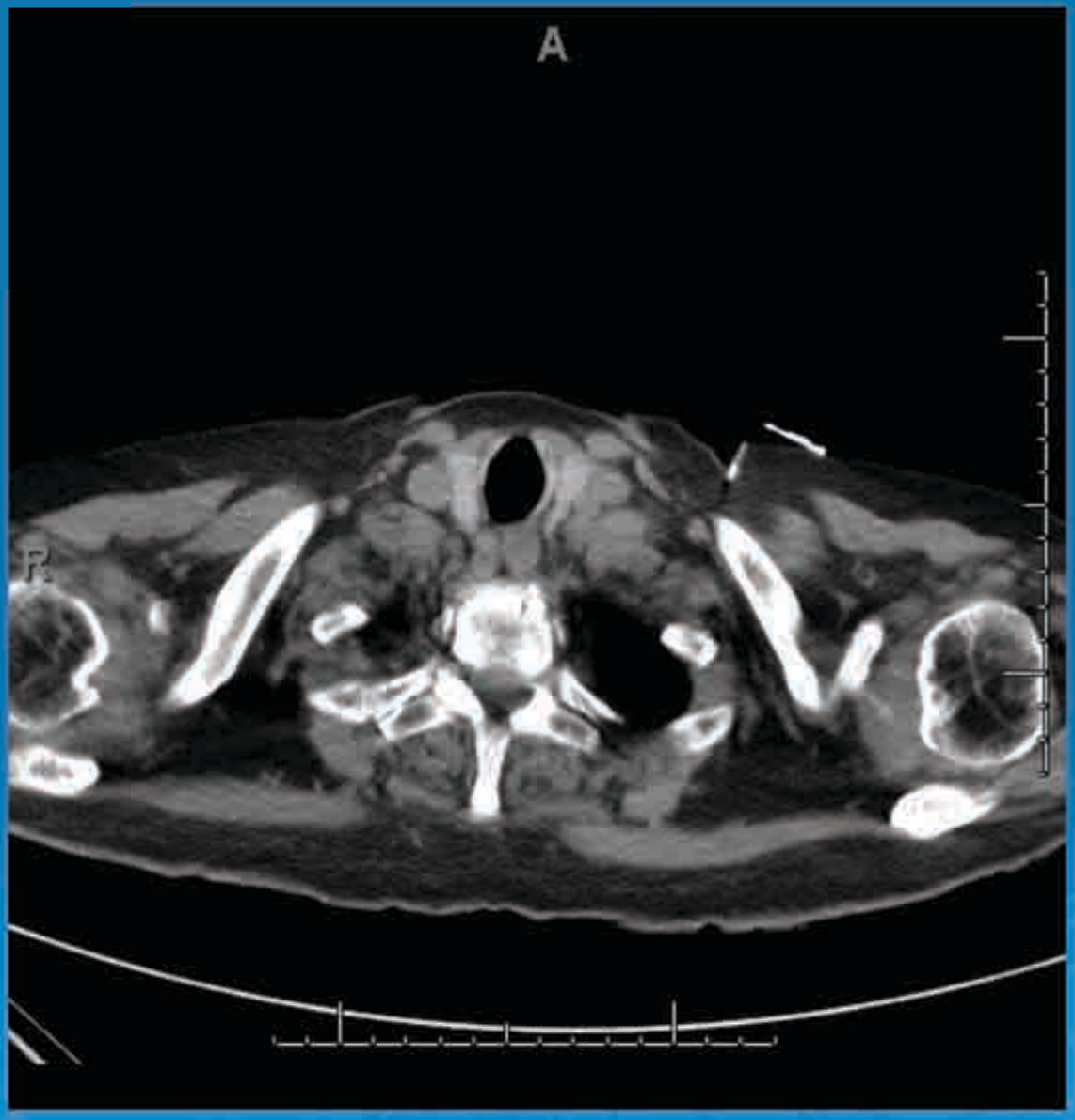


87 y/o female with productive cough and hypoxia

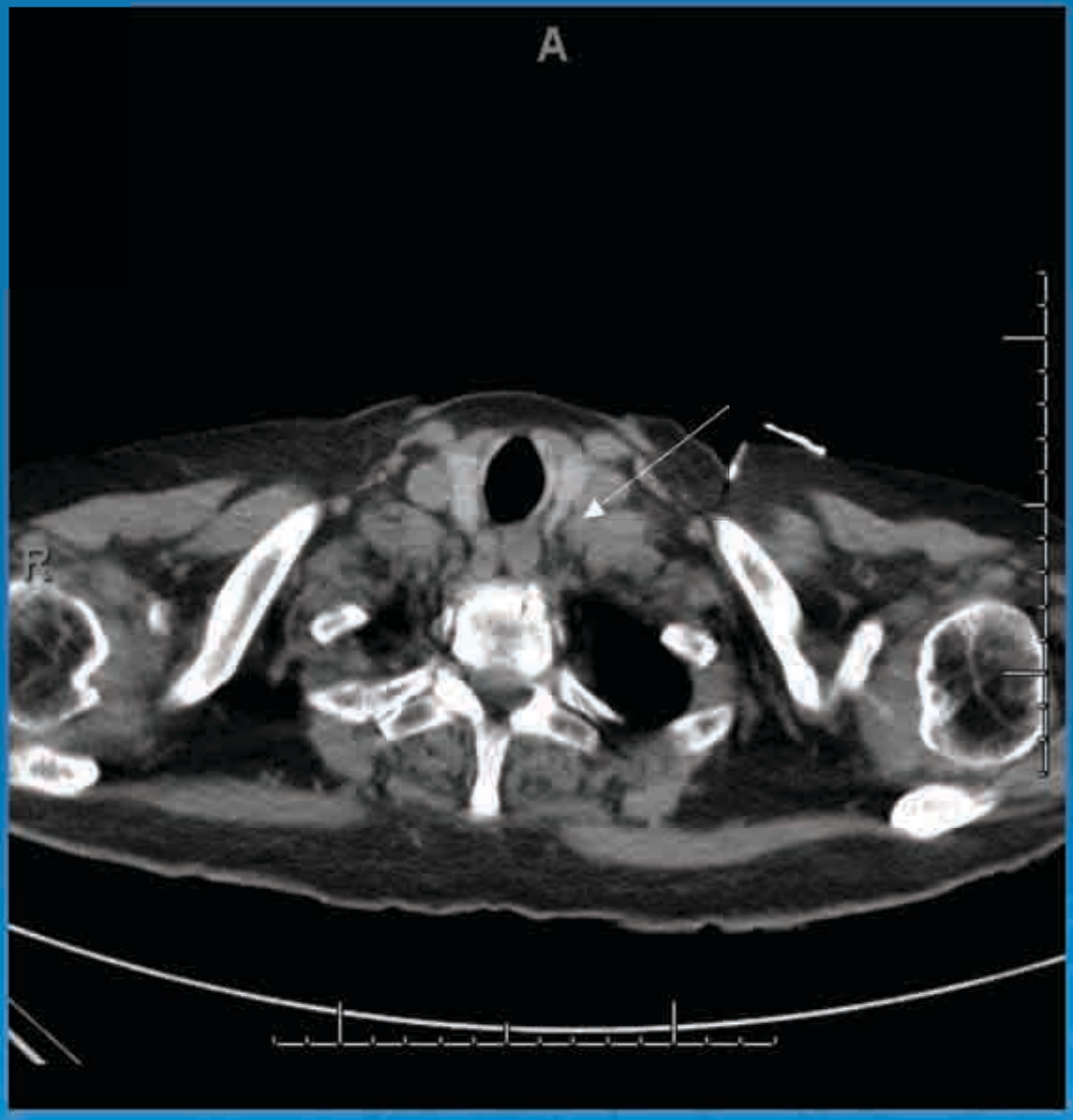


No improvement on antibiotics.

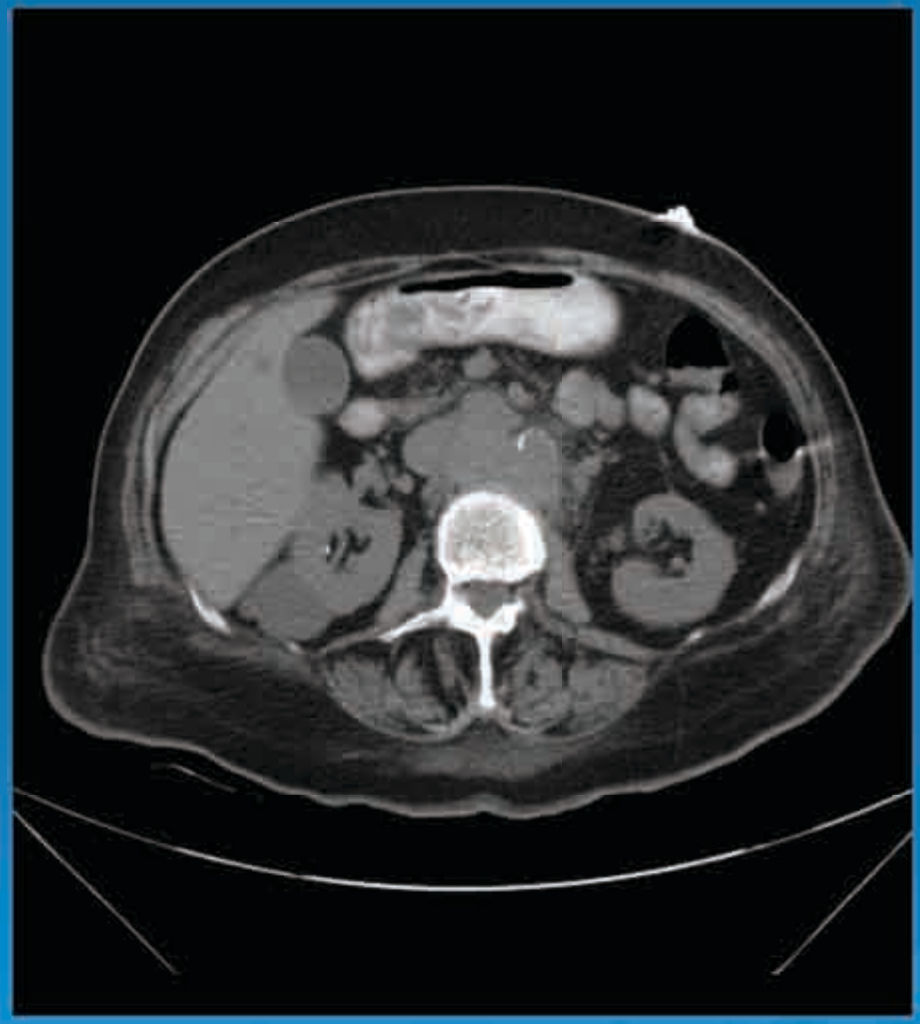
More superiorly



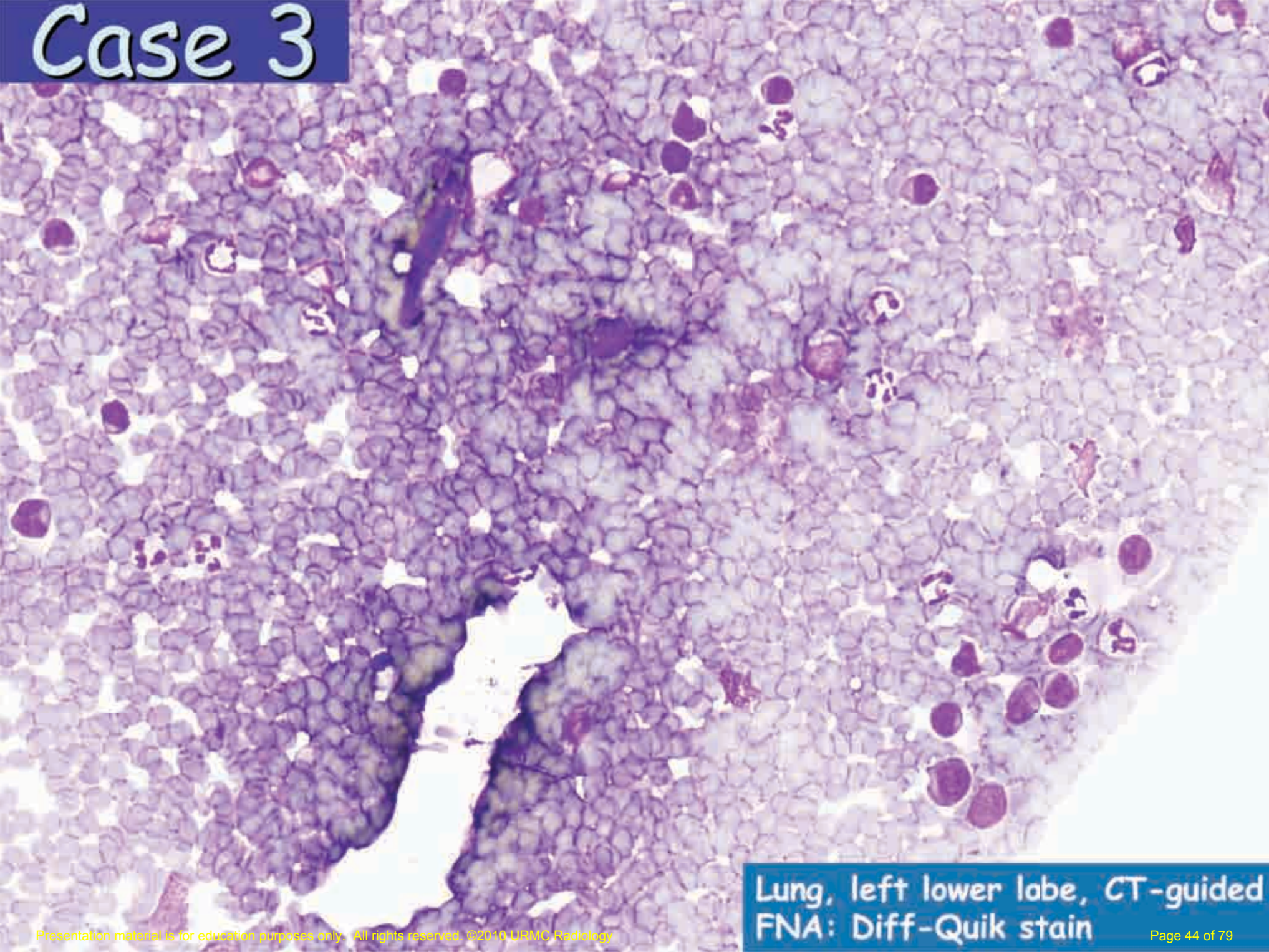
More superiorly



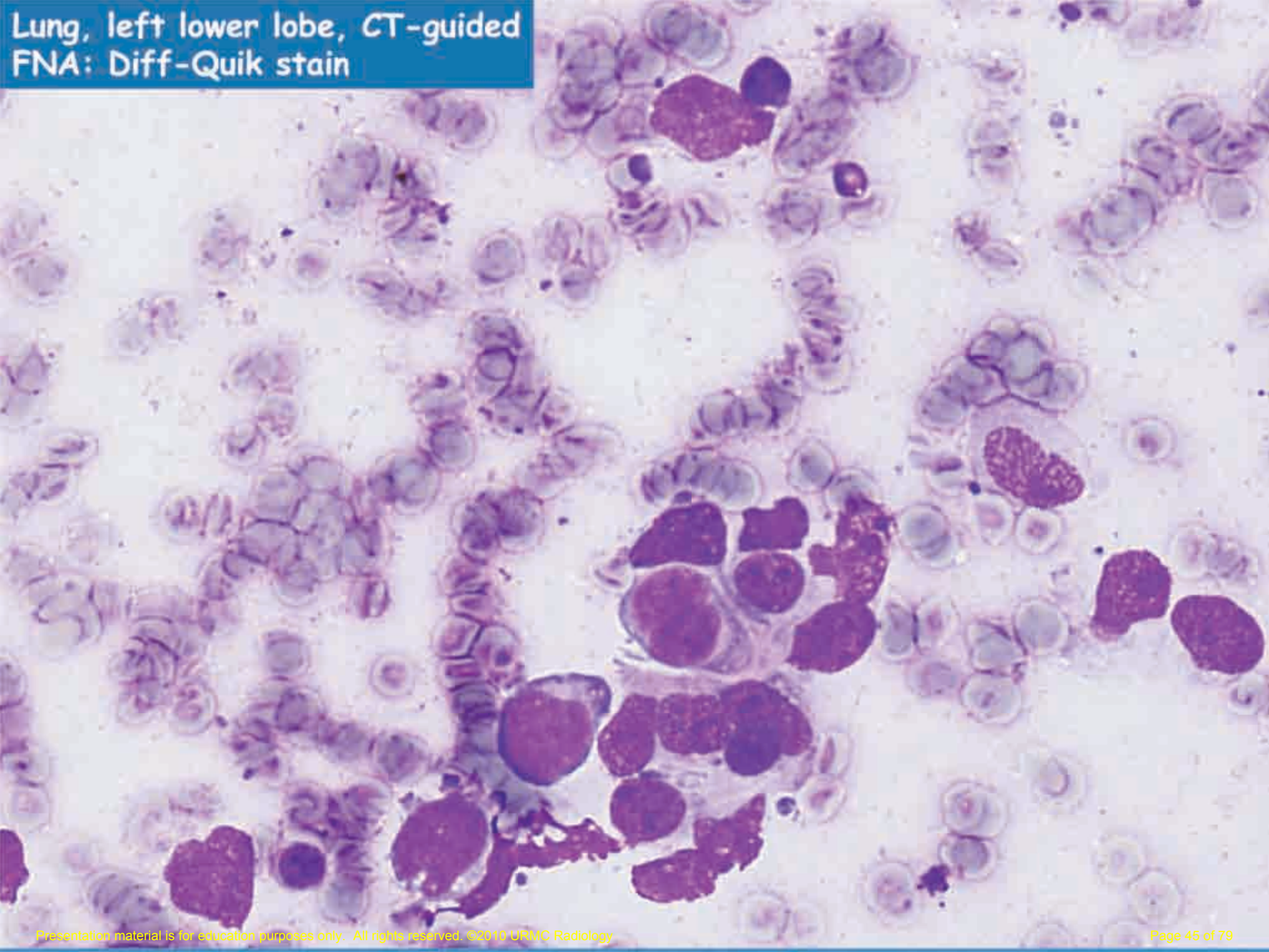
More inferiorly



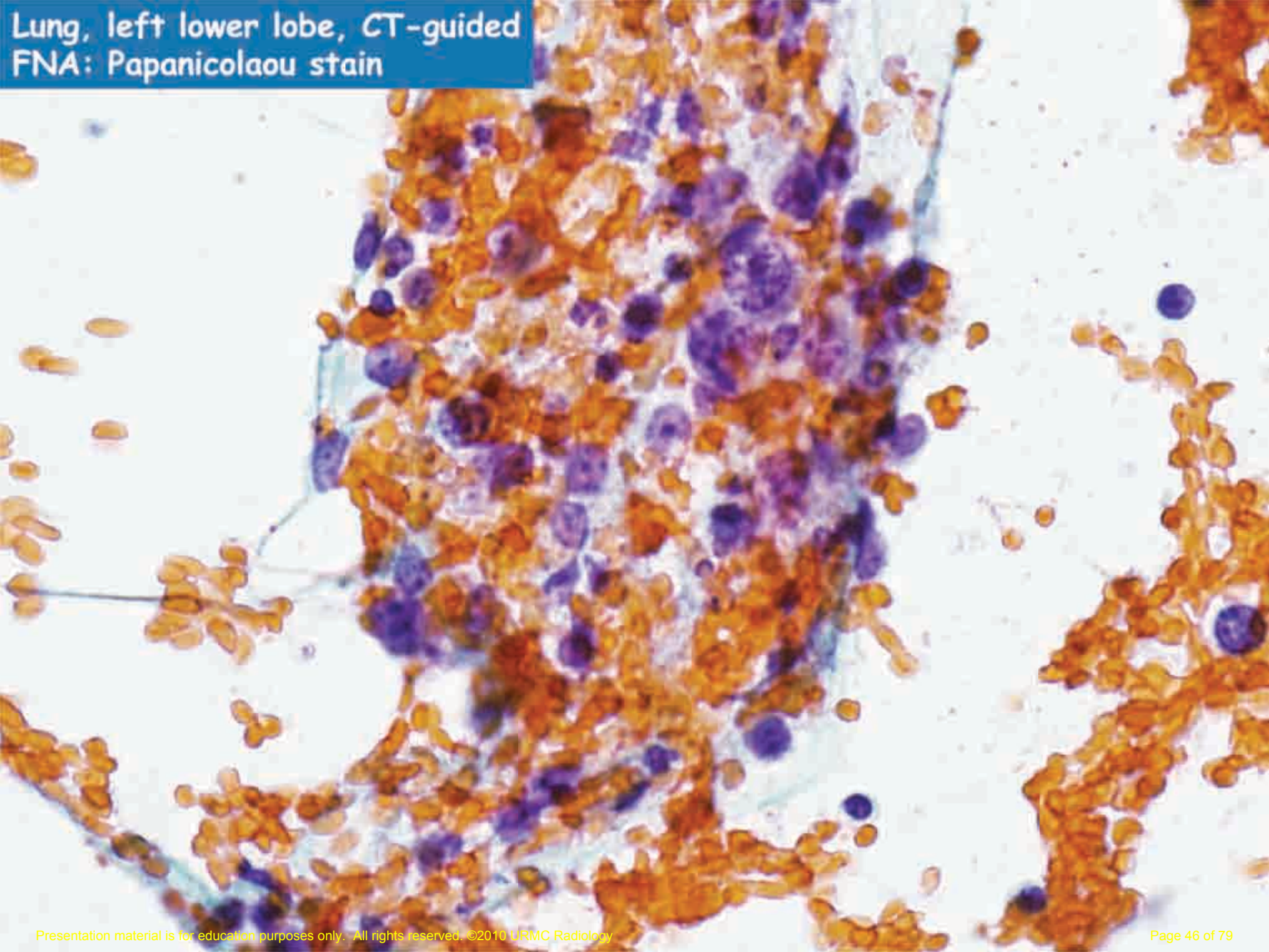
Case 3

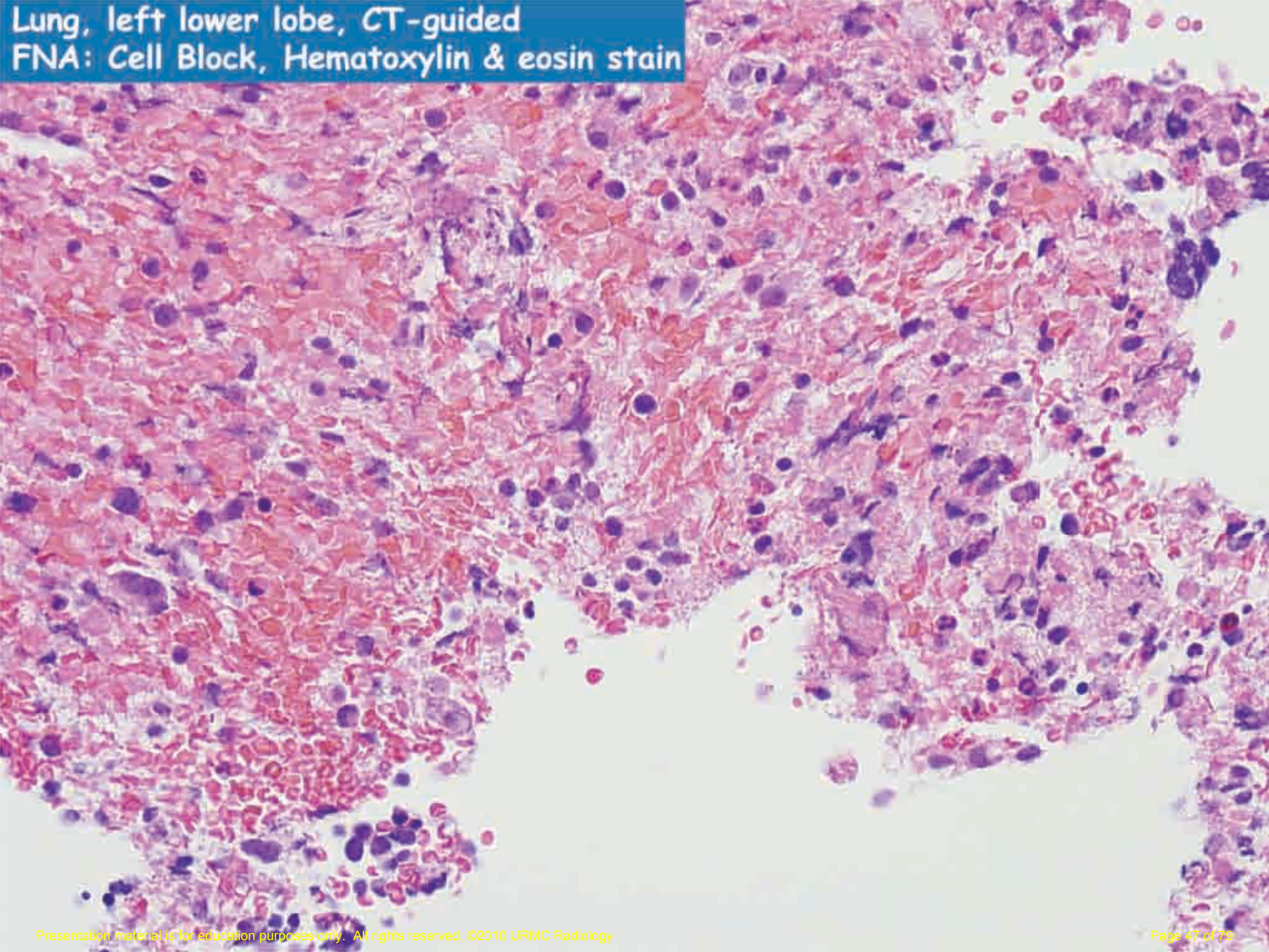


Lung, left lower lobe, CT-guided FNA: Diff-Quik stain



Lung, left lower lobe, CT-guided FNA: Papanicolaou stain





Lung, left lower lobe, CT-guided fine needle aspiration:

Malignant tumor cells present derived from malignant lymphoma

Cell block and cytologic preparations examined

Flow cytometry: lung, left lower lobe, fine needle aspiration:

- B-cell lymphoma
- Rare large malignant lymphoid cells identified

A kappa restricted B-cell population is present. The specimen is not sufficient for subtyping of this Non Hodgkin lymphoma. The majority of cells are small, but there are occasional large malignant forms.

B-cell Lymphoma

- **Flow Cytometry**

Markers studied: Kappa, Lambda, CD45 and CD 19. The low side scatter, low forward scatter gate contains 16.5% of total cells. Within this gate 36% of cells are Kappa restricted CD 19+ B cells.

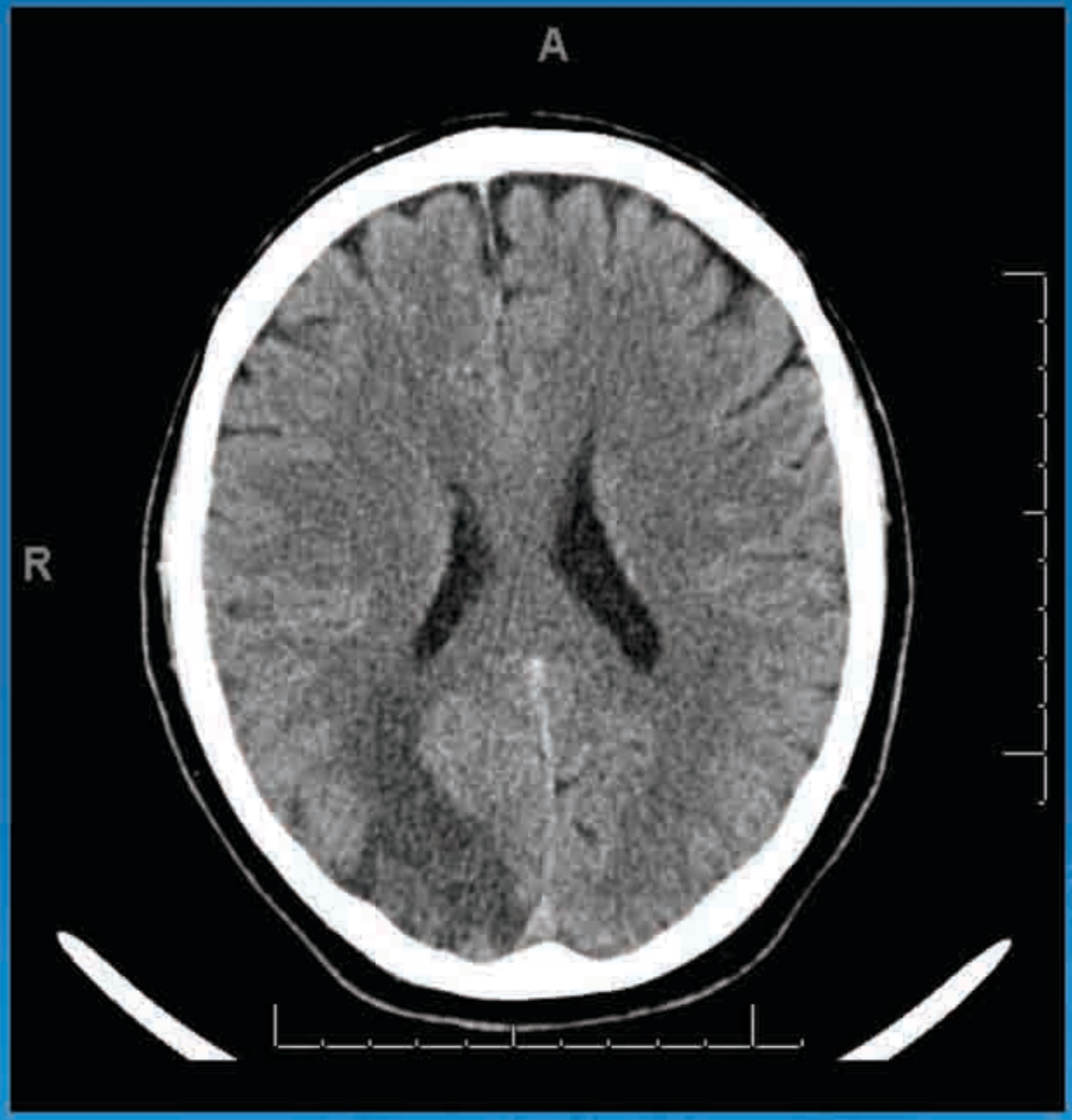
Take home Rad messages

- Recurrent/secondary lymphoma more likely metastasizes to the lungs.
- Unless previous lymphoma, normally don't include lymphoma as a differential for lung parenchymal involvement without adenopathy.

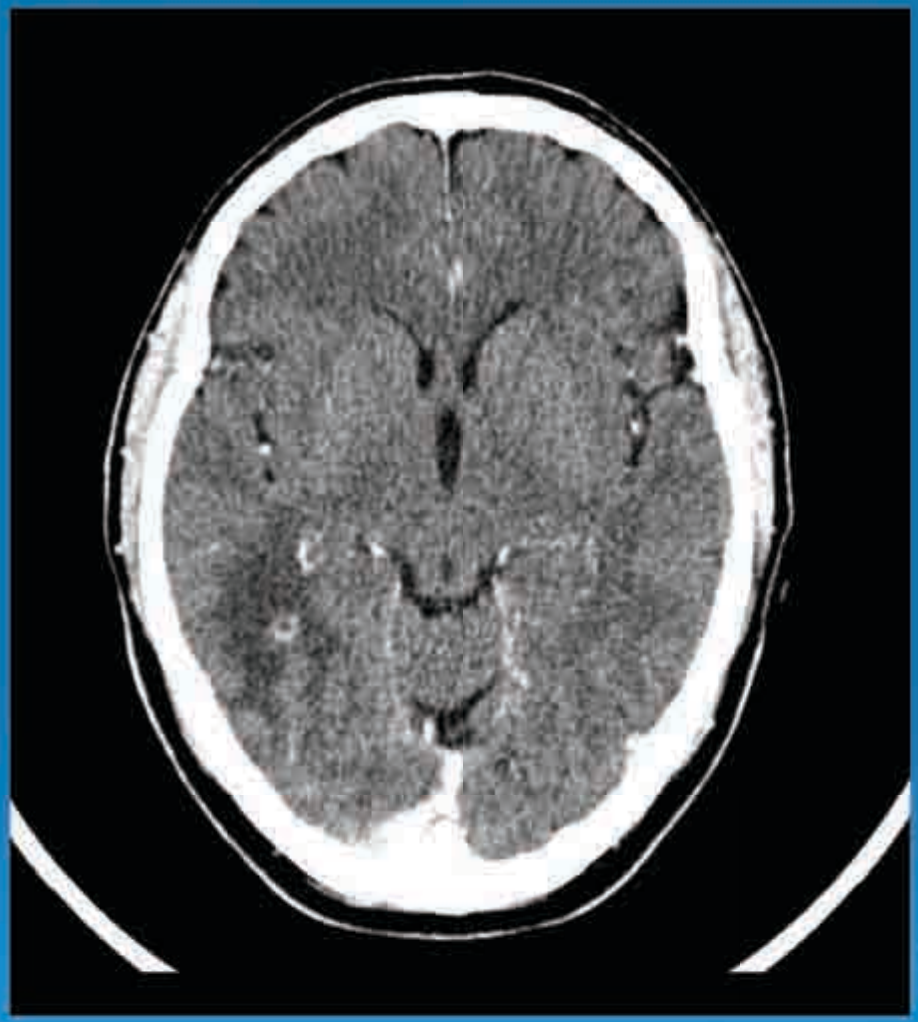
Take home Rad messages

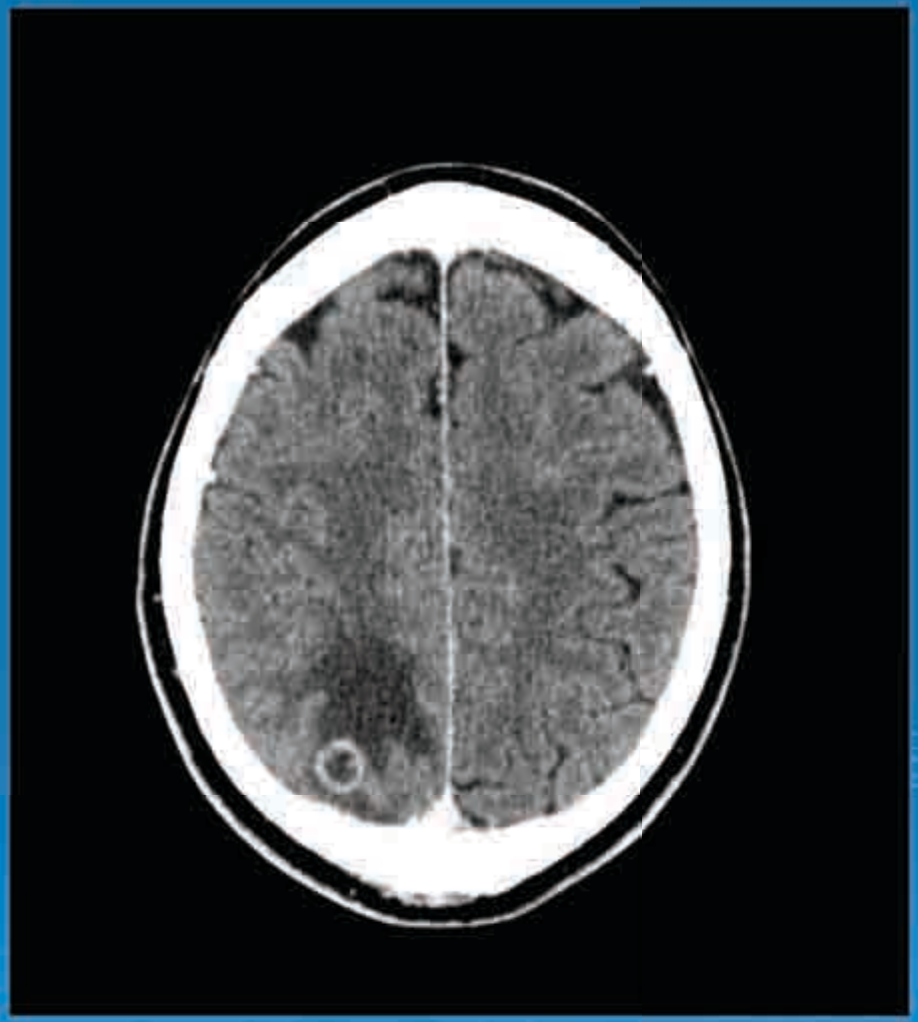
Case 4

63 y/o male with slurred speech and pronator drift.
History of IV drug abuse.

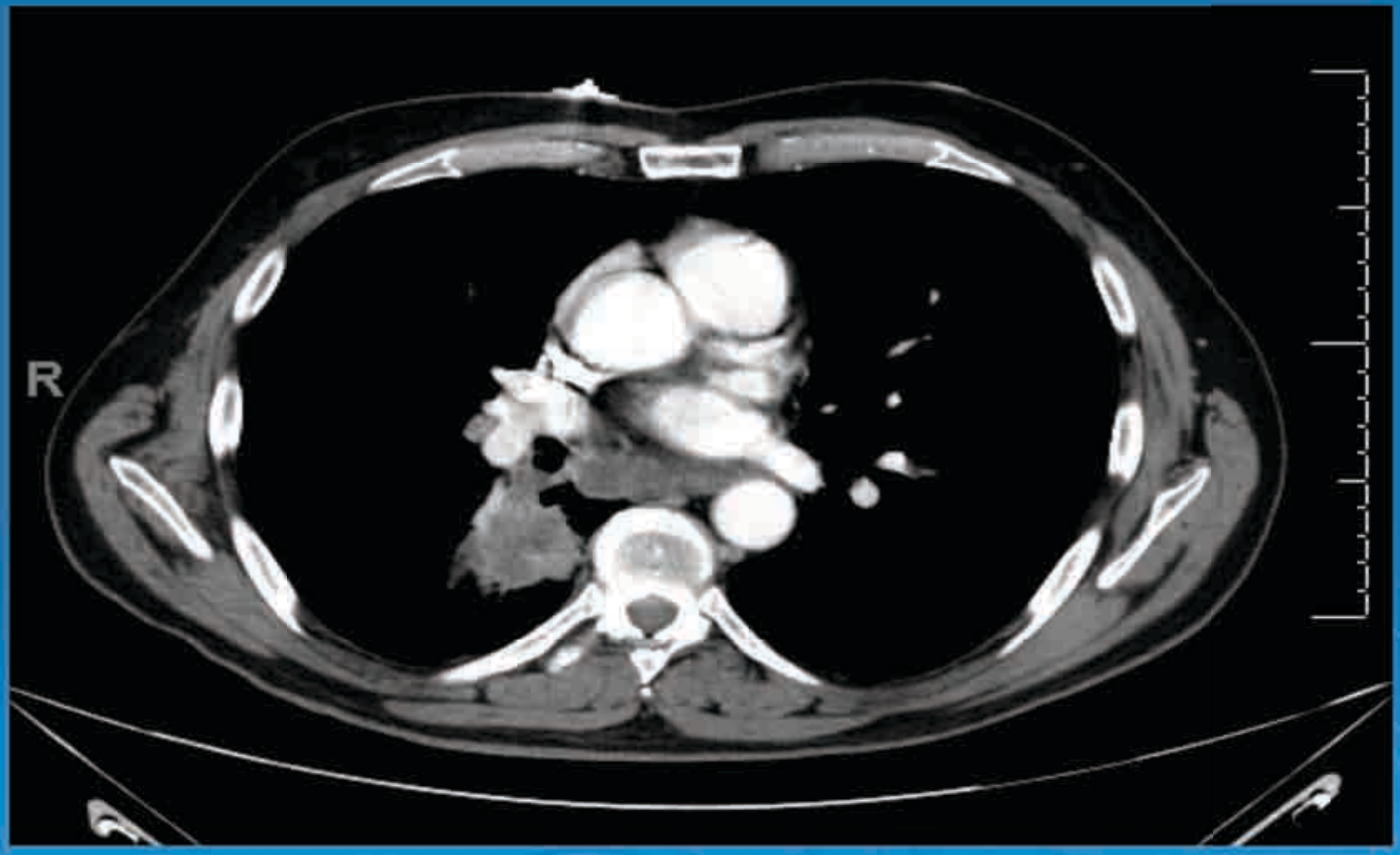


Head CT with contrast

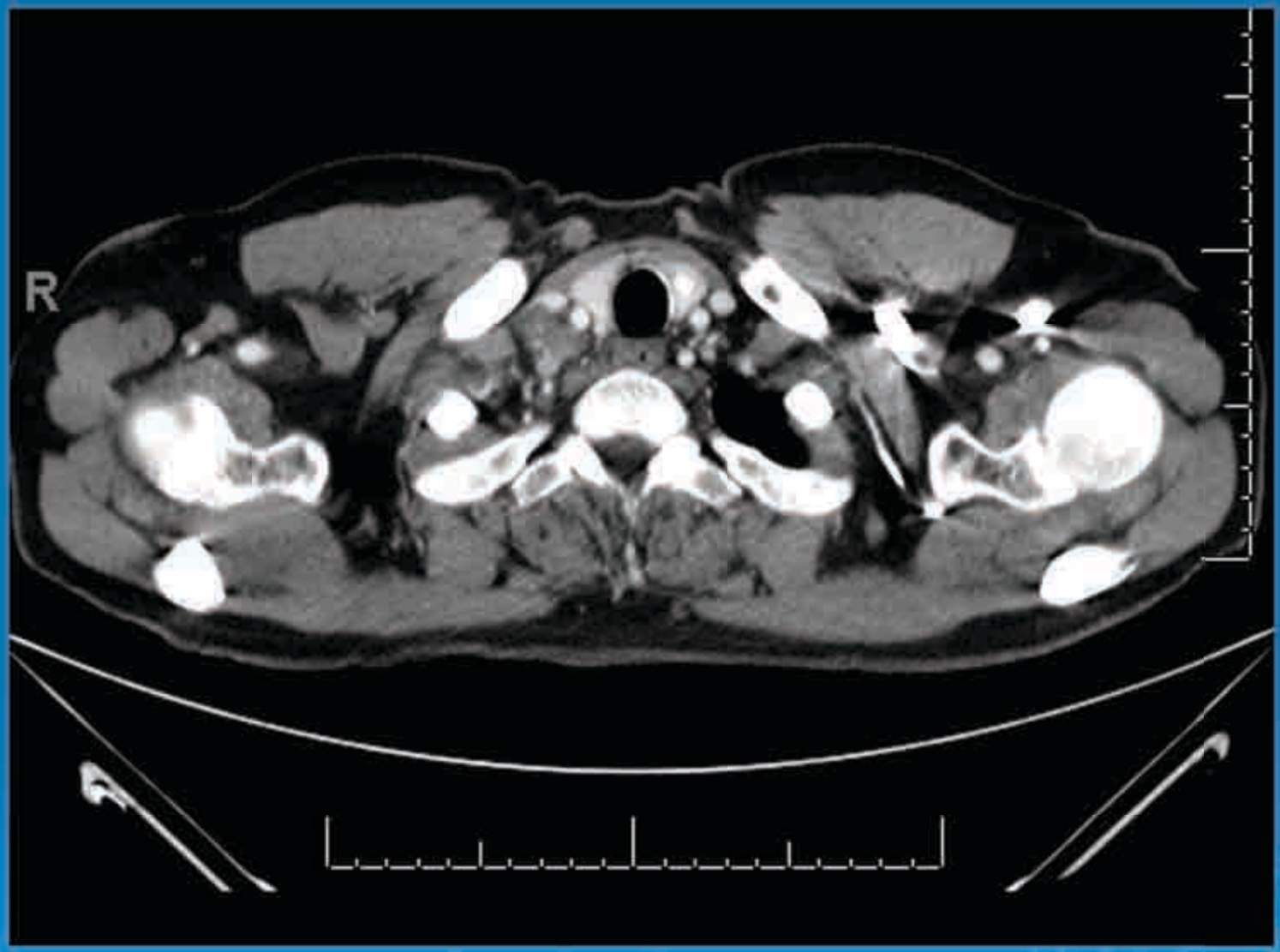




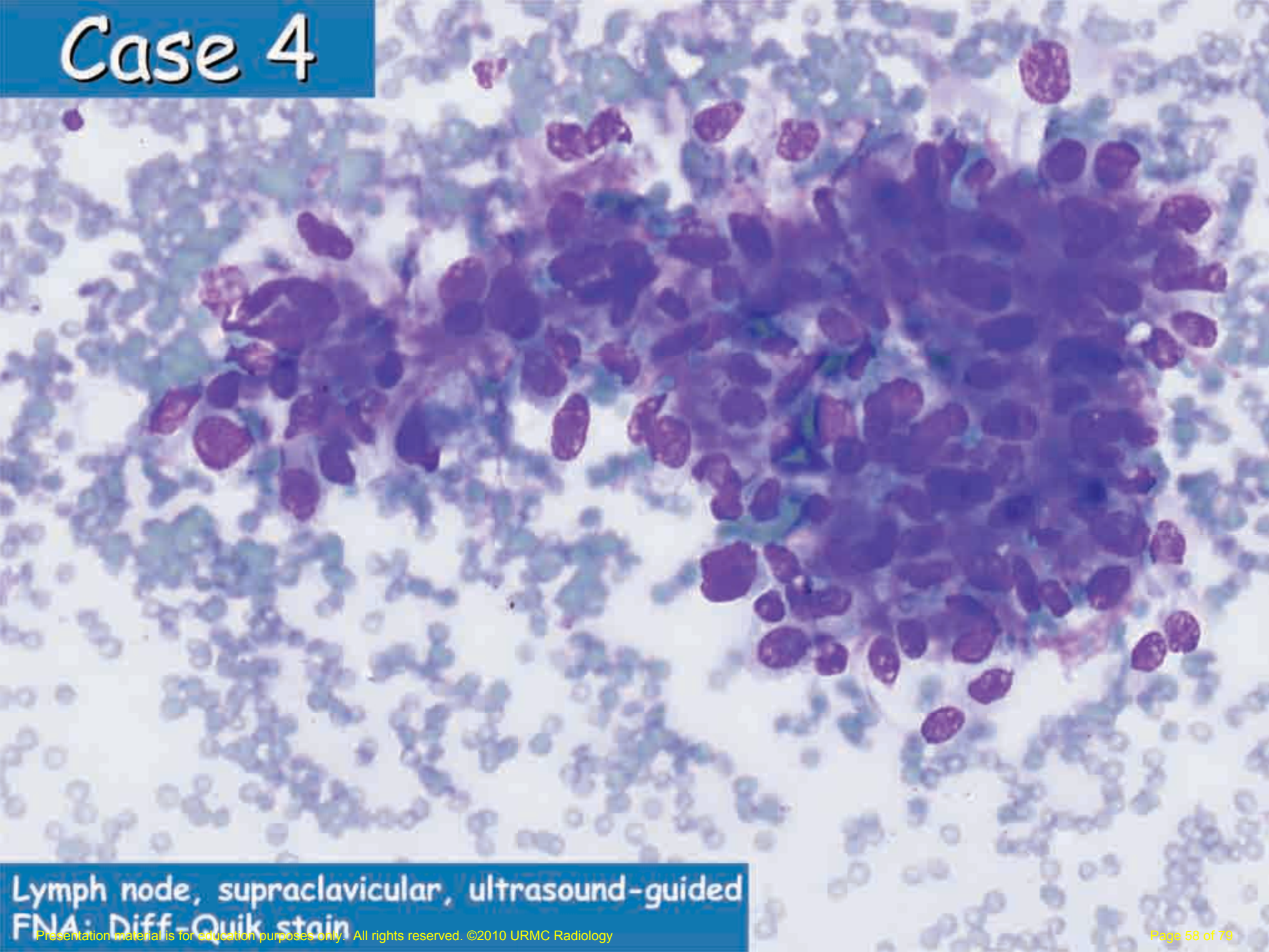
Evaluation for source of abscess or met



Look for source to biopsy

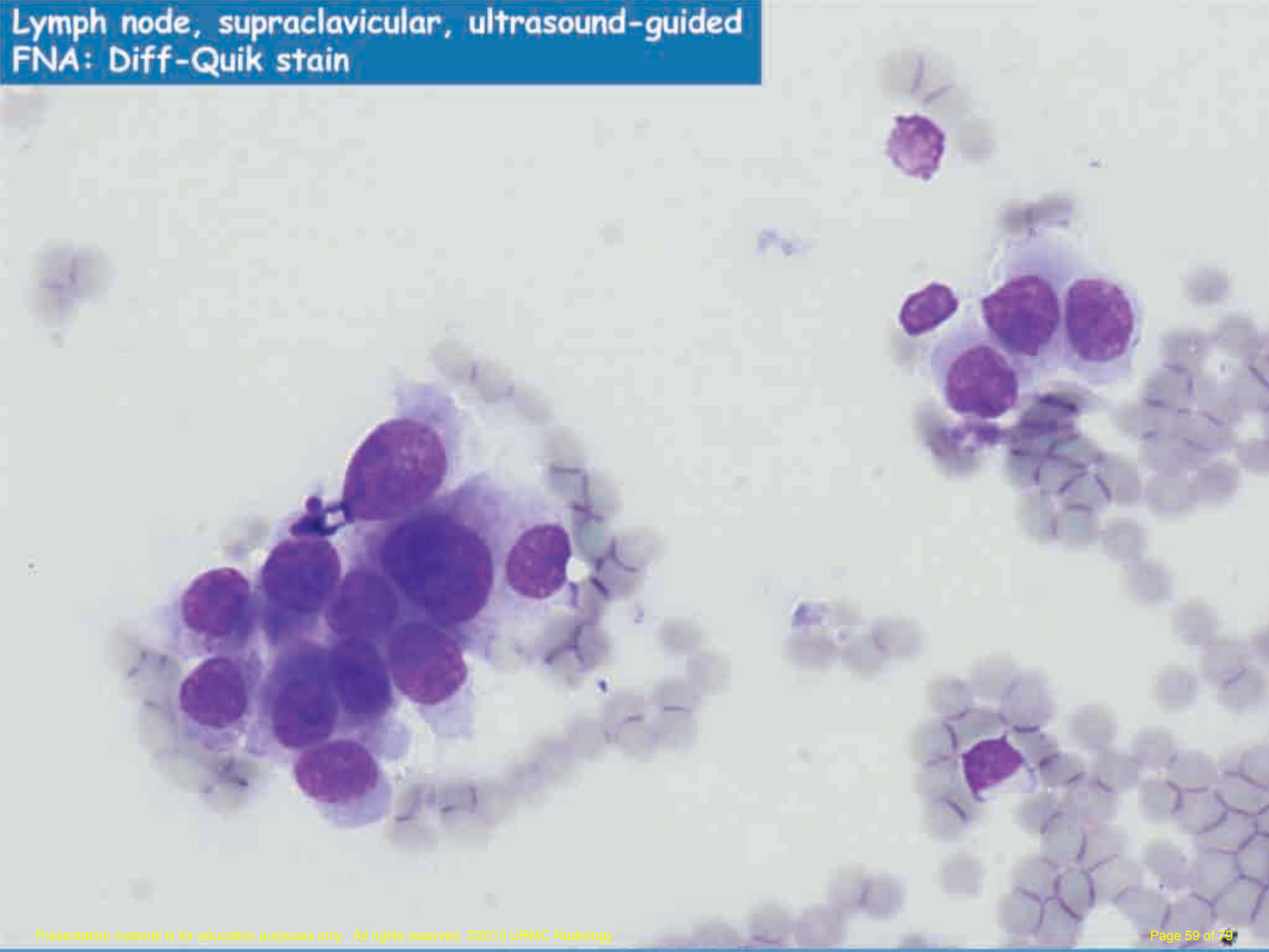


Case 4

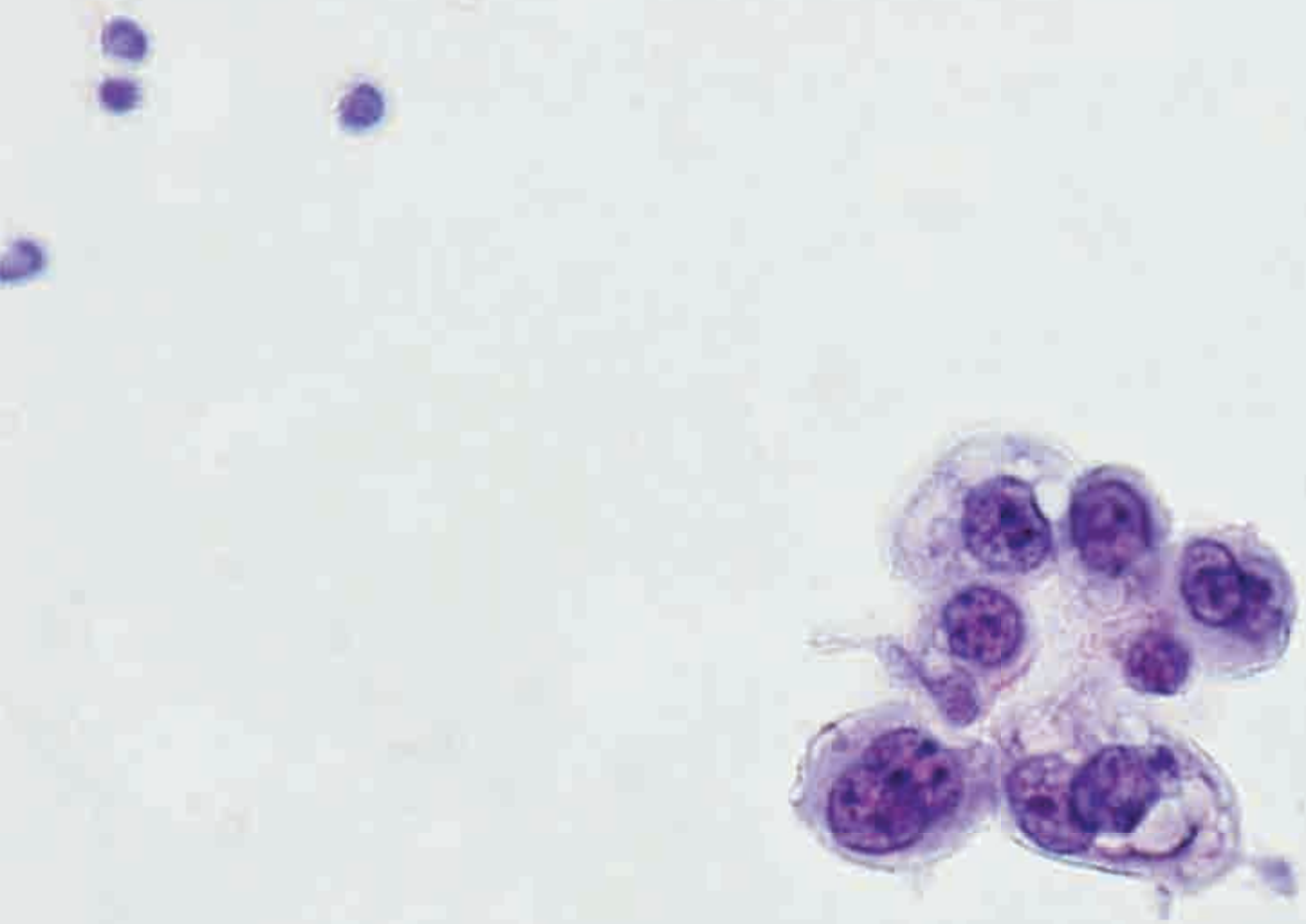


Lymph node, supraclavicular, ultrasound-guided FNA; Diff-Quik stain

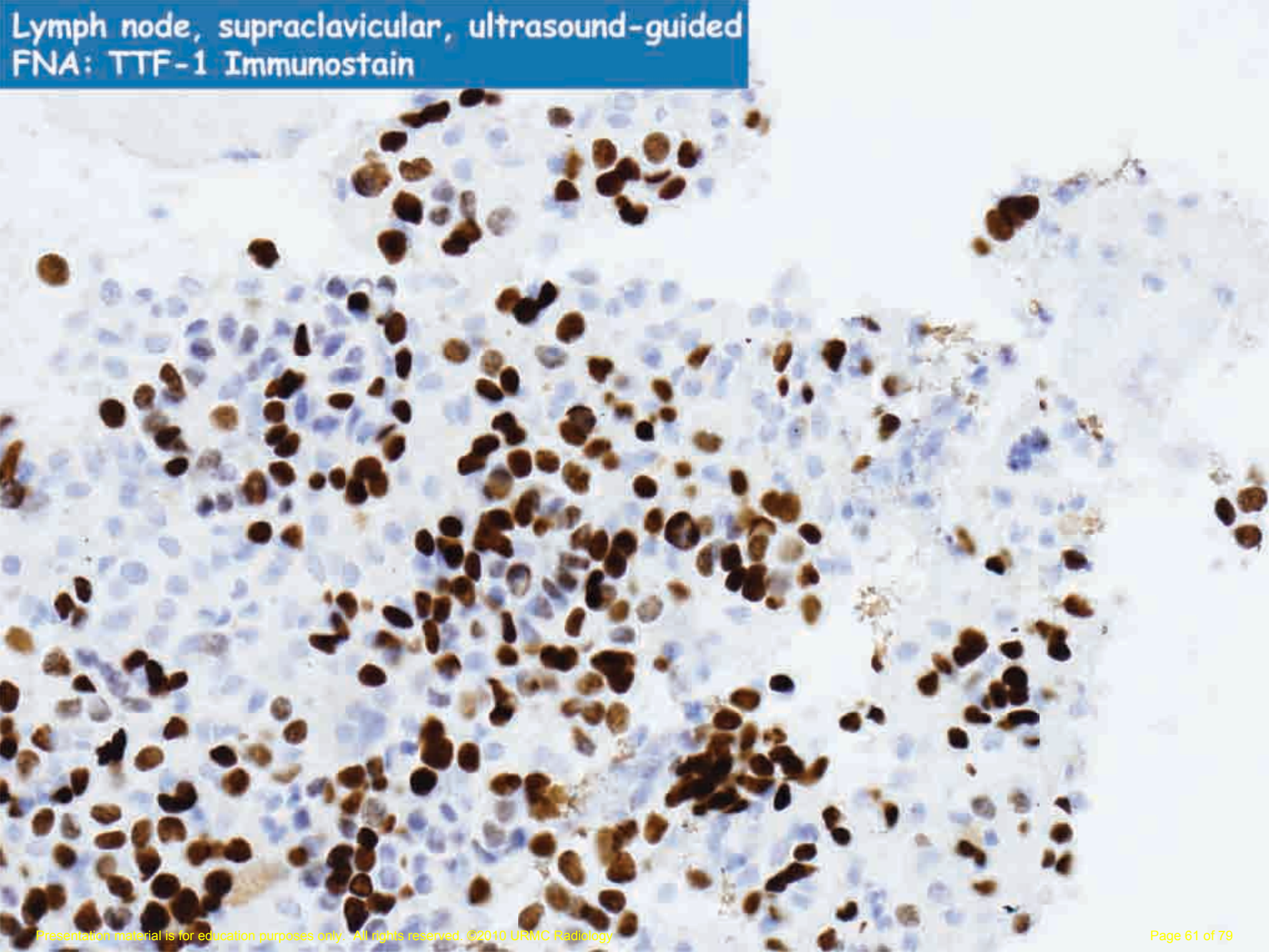
Lymph node, supraclavicular, ultrasound-guided FNA: Diff-Quik stain



Lymph node, supraclavicular, CT-guided FNA: Papanicolaou stain



Lymph node, supraclavicular, ultrasound-guided FNA: TTF-1 Immunostain



TTF-1

Thyroid transcription factor:

- Expression in lung and thyroid tumors
- Differentiates lung carcinoma from: breast carcinoma, mesothelioma, colonic carcinoma and other malignancies

Lymph node, supraclavicular, ultrasound-guided fine needle aspiration:

Metastatic adenocarcinoma consistent with a lung primary.

Comment: Immunohistochemical stain for TTF-1 is positive, p63 immunostain is negative.

Cell block and cytologic preparations examined

Metastatic Adenocarcinoma -Lung

- Most common lung carcinoma in females and non-smokers
- Positive immunostaining for CK-7, TTF-1, Napsin A, EMA, CEA and negative for CK-20
- Differential diagnoses include breast, stomach, colon, pancreas, GI tract

Take home Rad messages

- Abscess vs. brain metastasis are often indistinguishable on CT.
- However, if you don't include abscess, and it is ….

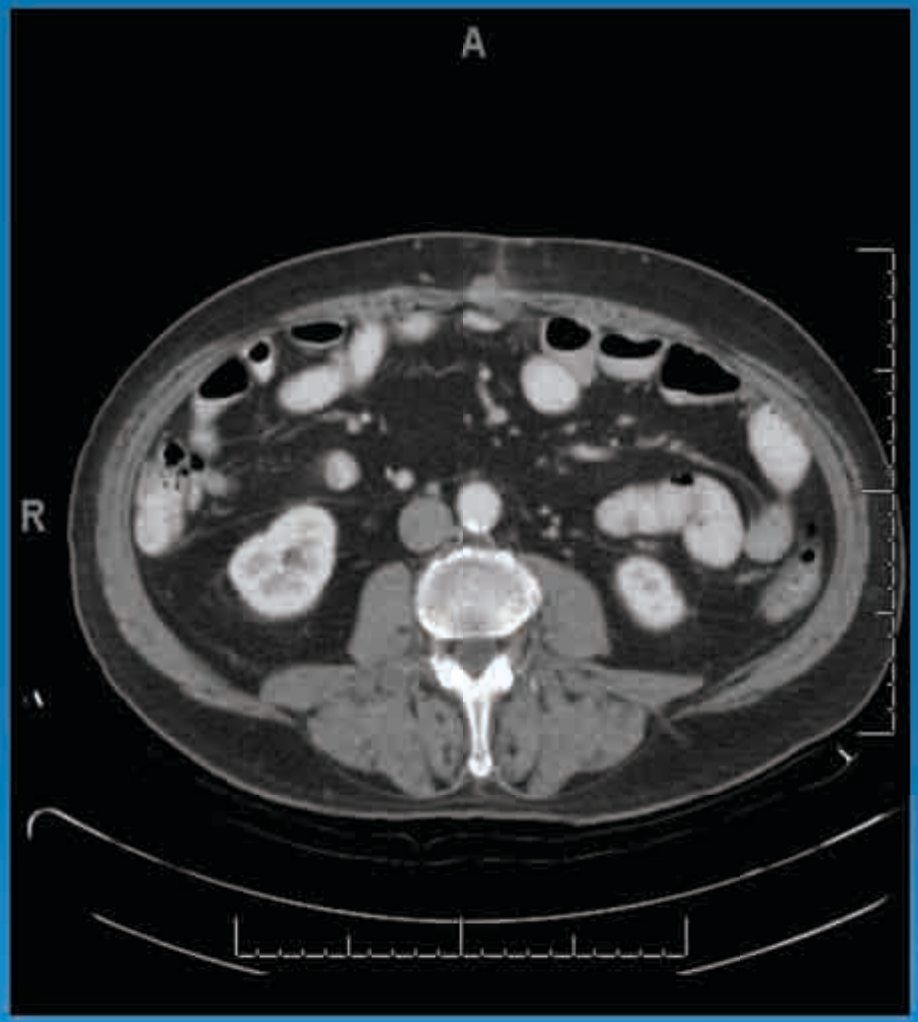
  Delay in antibiotics could be deadly.

Case 5

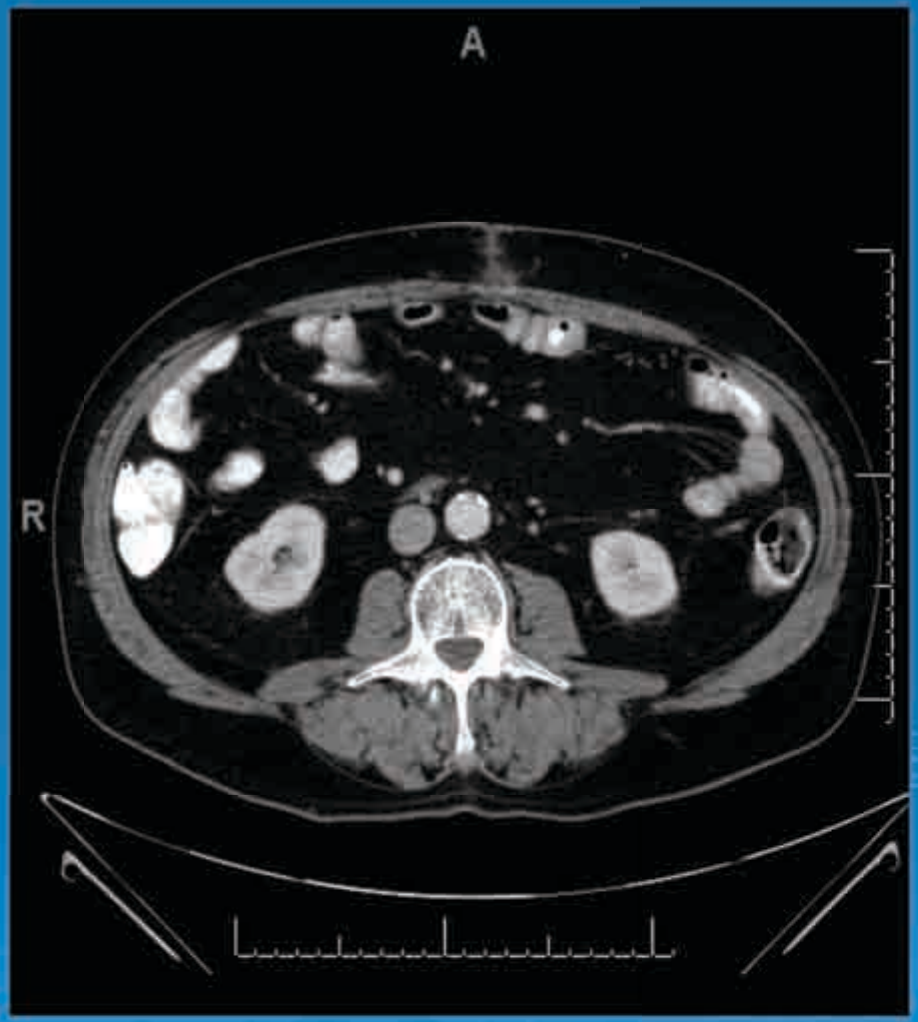
63 y/o male status post esophojejeunostomy for gastric adenocarcinoma

4 months post surgery

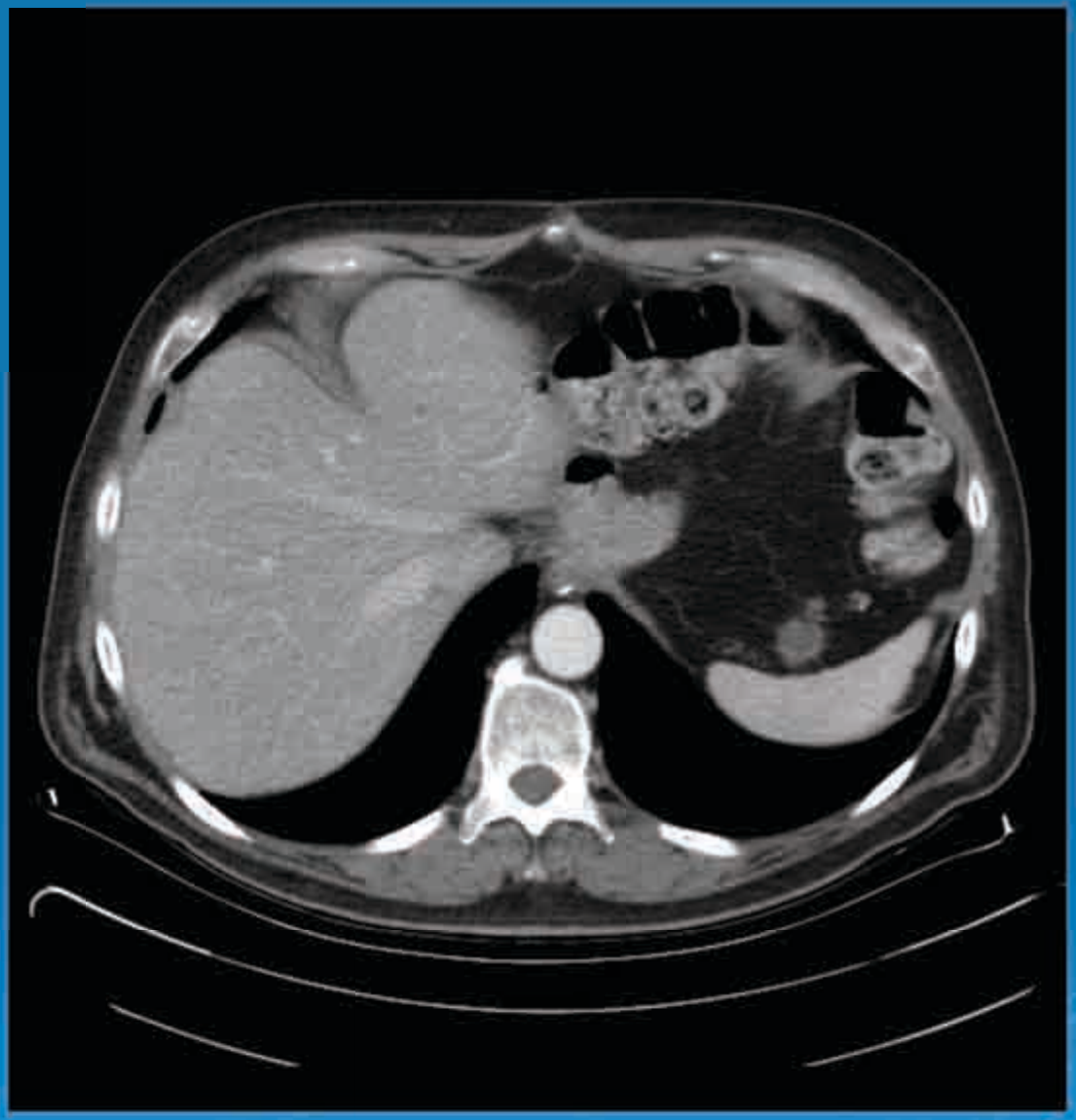
4 months post surgery



1 month post surgery

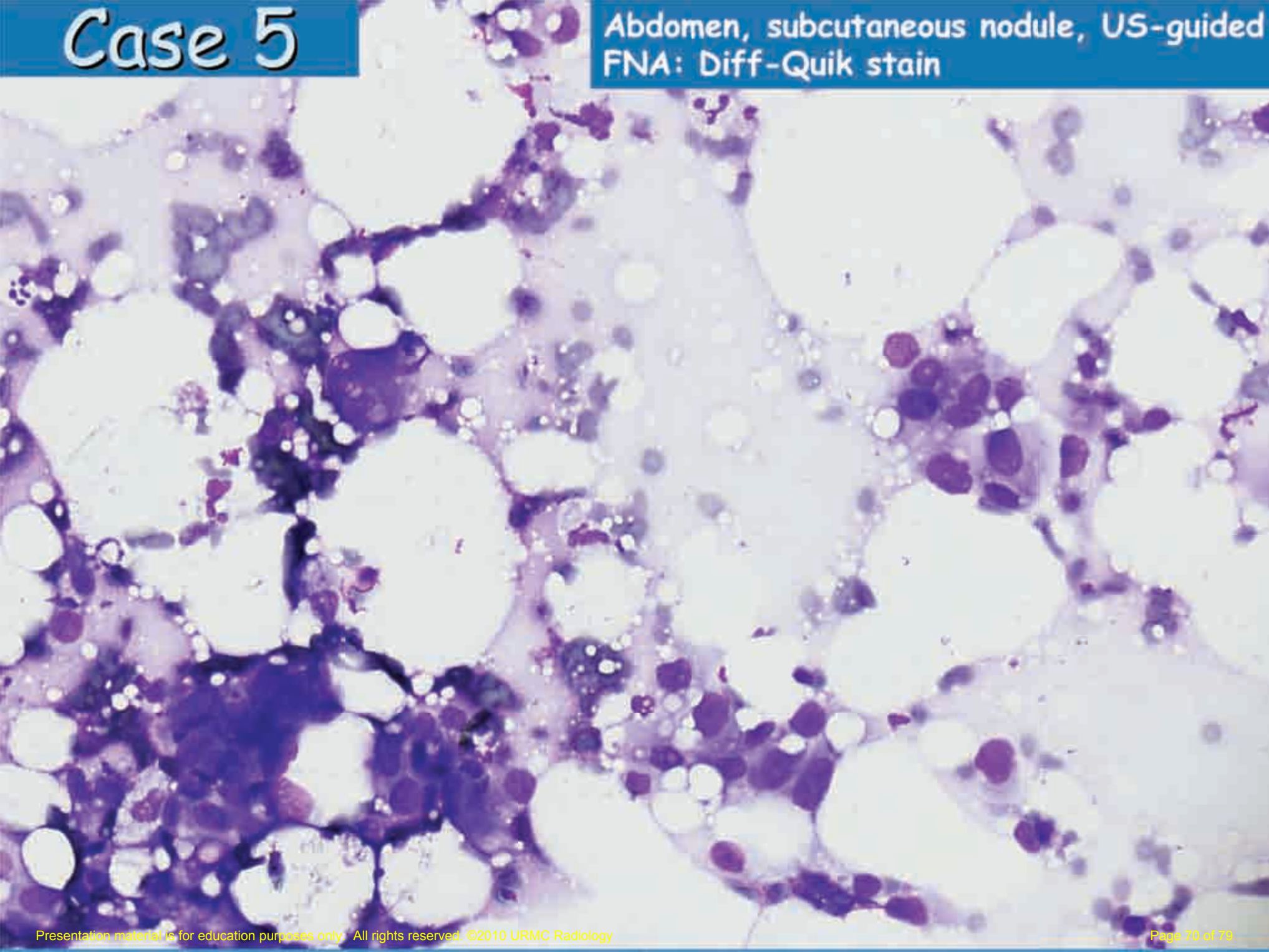


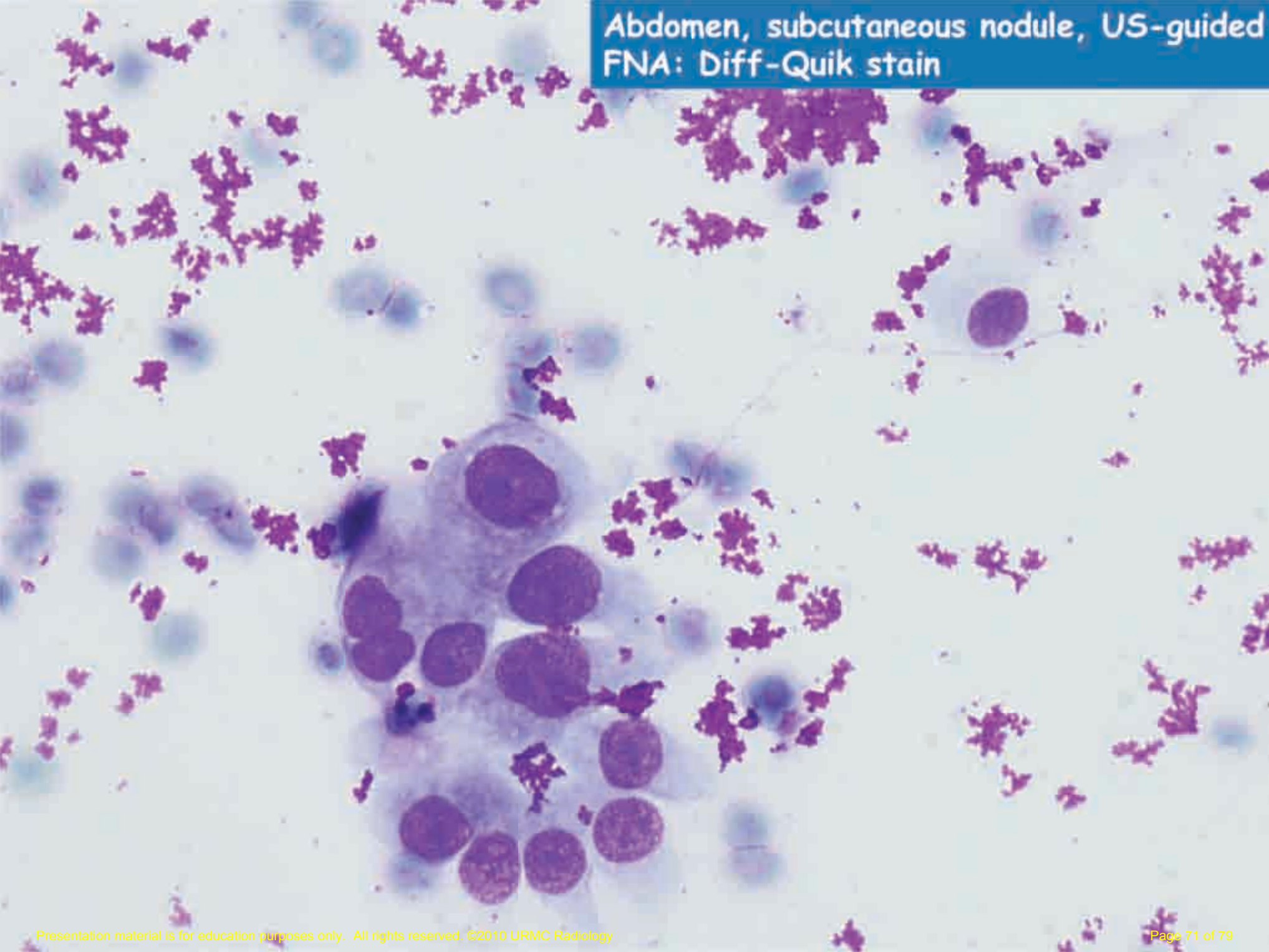
Also 4 months post surgery



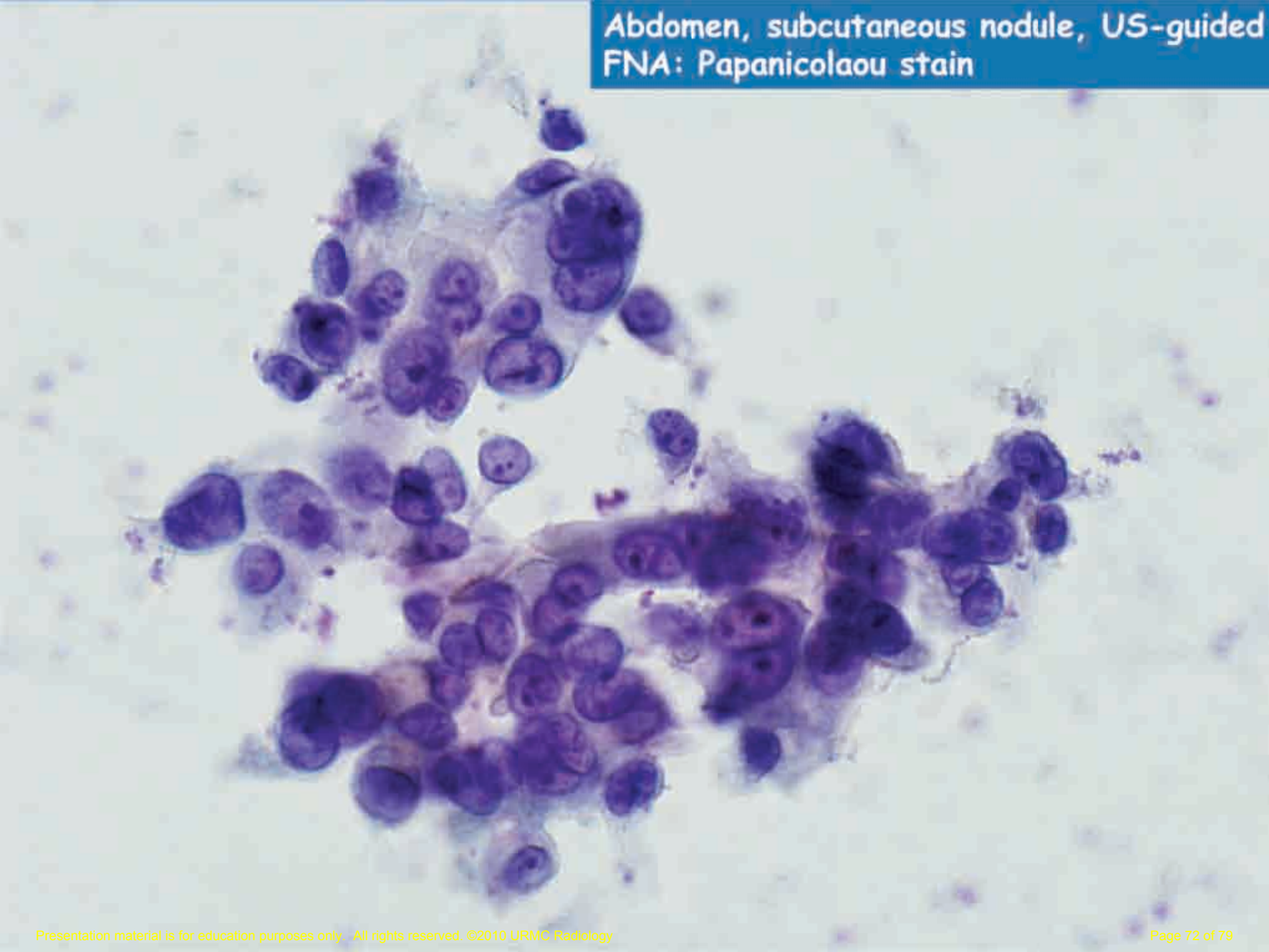
Case 5

Abdomen, subcutaneous nodule, US-guided FNA: Diff-Quik stain





Abdomen, subcutaneous nodule, US-guided FNA: Papanicolaou stain



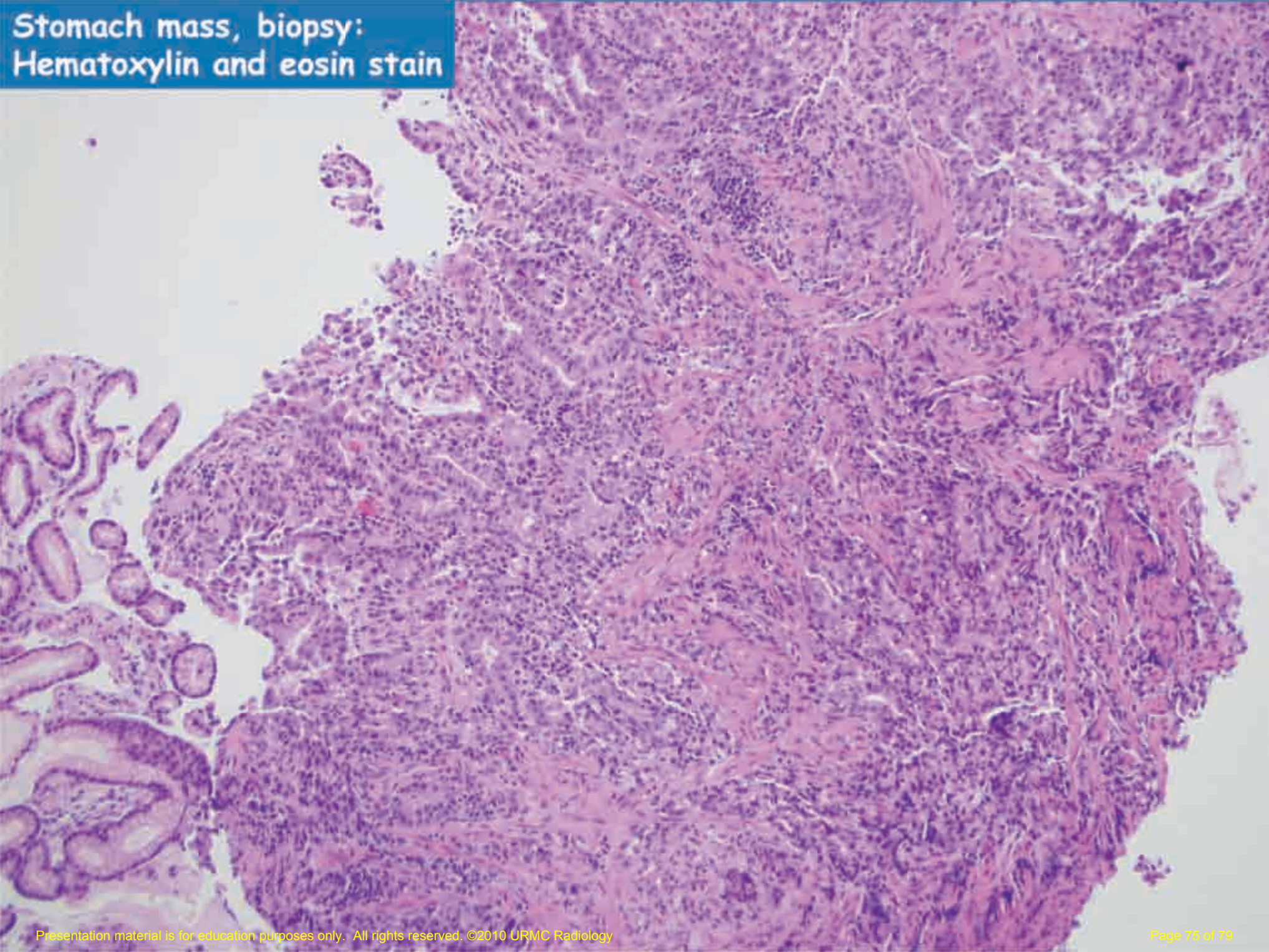
Abdomen, subcutaneous nodule, ultrasound-guided fine needle aspiration:

Malignant tumor cells present derived from adenocarcinoma, compatible with gastric primary

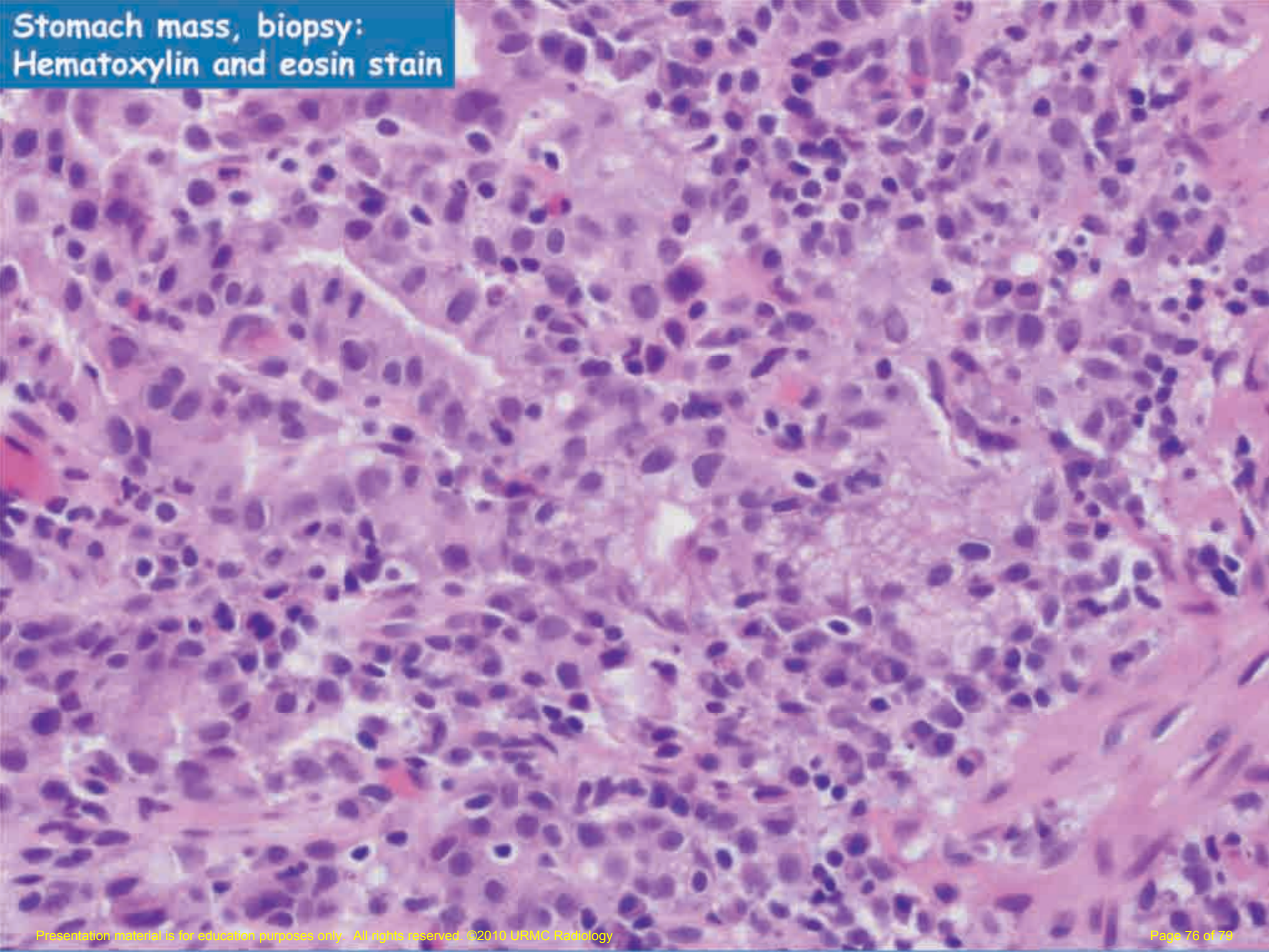
Stomach mass, biopsy:

Invasive moderate to poorly differentiated adenocarcinoma

Stomach mass, biopsy: Hematoxylin and eosin stain



Stomach mass, biopsy:
Hematoxylin and eosin stain



Metastatic Adenocarcinoma - Gastric

- Surgical eradication of primary tumor combined with resection of region LN – only curative treatment for gastric CA
- Local or regional recurrence occurs in 40-65% of patients with curative treatment
- Gastric CA 2nd cause of cancer related deaths worldwide, wide geographic variability in incidence
- High incidence in Japan, China, Costa Rica, Chile, Eastern Europe and Portugal; low incidence in the US and England

Esophagus and stomach , proximal esophagogastrectomy:

Adenocarcinoma, moderately differentiated

- Tumor size – 5 cm
- Tumor extent – invades into esophageal adventitia and gastric subserosal fat
- Lymphovascular invasion – present
- Treatment effect – no definite response, extensive residual CA
- Margins – negative

Suggested Panels for the Classification of Various Tumors

Tumor Type	Common Immunomarkers
Carcinomas (Epithelial Tumors)	Pankeratin, CK 7 and CK 20, TTF-1, Napsin-A, CDX-2, CalR, CK 5/6, CEA, EMA, B72.3, Hep-Par1
Lymphomas	CD45, CD 3, CD 20, CD 30, CD 15, Kappa, Lambda, CD138 (plasma cell)
Sarcomas (Mesenchymal Tumors)	S-100, Myogenin, MSA, SMA, Vimentin CD 99, CD 31, CD 34, C-kit
Melanoma	S-100, HMB-45, Melan-A, Cytokeratin (-)
Neural/NE	Chromogranin, Synaptophysin, CD 56, GFAP