Rad-Path Clinical Correlation: Lung Nodules in a 76 y.o. Man with HCC

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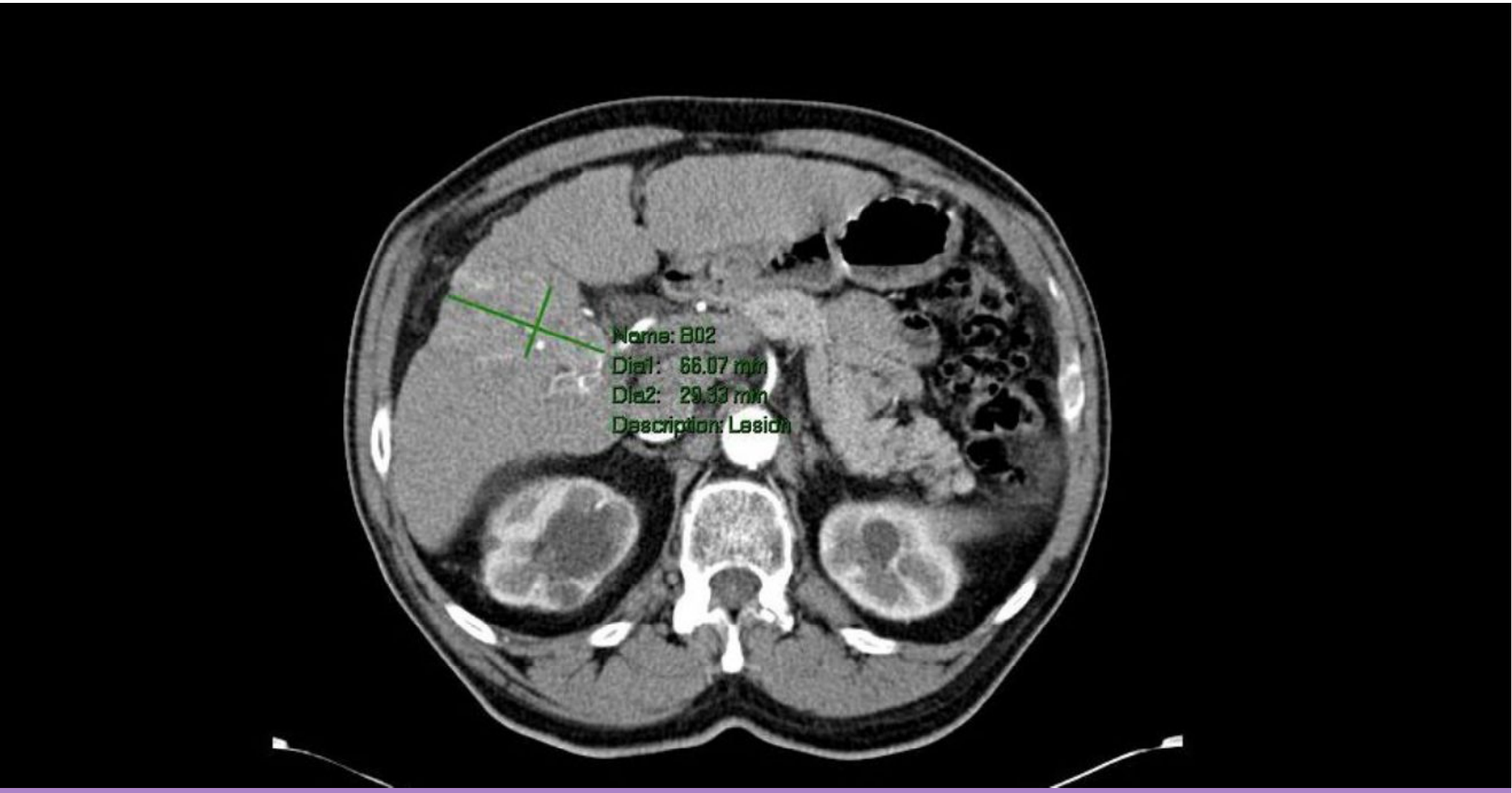
Presentation (June)

76 y.o. man with PMH significant for chronic Hep B presenting to UVA GI in June for liver mass detected on routine RUQ U/S surveillance and followed up with CT. Outside CT was read at UVA:

"Liver: **Ill-defined arterially enhancing mass** within hepatic segment 5/8 (6.6 cm x 2.9 cm). This mass **extends to the right portal vein near the main portal vein bifurcation with adjacent thrombus in the right portal vein**. There is suggestion of enhancement within the thrombus on delayed imaging as can be seen with tumor thrombus. **Nodular surface contour of the liver**."



5/24/17 CT Abdomen

PMH

Patient reports diagnosis of Hepatitis B over 10 years ago and estimates he's been treated with Tenofovir for 4-5 years. Denies prior symptoms of liver disease including jaundice, dark urine, pale stools, abdominal pain, and abdominal swelling.

Emphysema secondary to smoking.

June labs:

- AST 39
- ALT 30
- Bilirubin 0.5
- Alkaline Phosphatase 120
- Albumin 4.2
- HBV DNA: Not detected

Social History and Family History

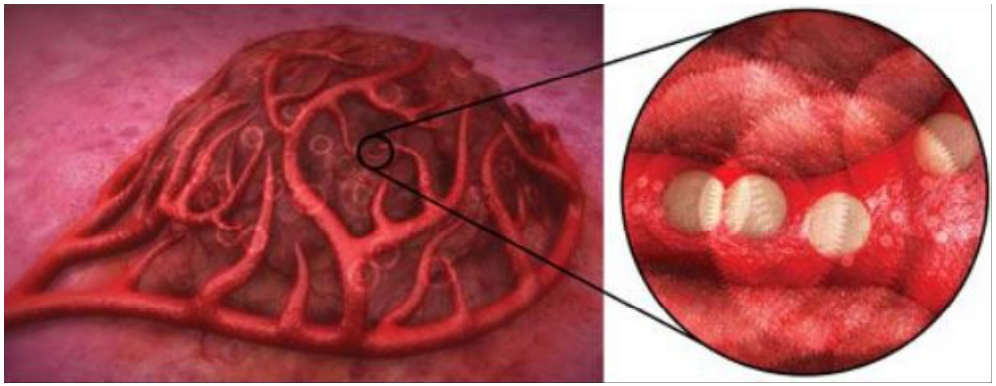
- Smoker: ¼-1 PPD. Years not reported.
- Occasional alcohol: 1-2 beers/week.
- No illicit drug use
- Occupation: Navy aircraft mechanic; later drove tractor trailors; retired 2 years ago.

- Family history negative for liver disease, lung disease, and cancer.

Referred to Rad-Onc and IR (July)

- Patient's primary treating physician is in Lynchburg, so no biopsy or pathology is on file for liver, but diagnosis of HCC was made. July labs notable for **AFP of 3513** (Ref Range <10).
- Referred back to UVA for Rad-Onc and IR consults. Options discussed include surgery, transplant, Y-90 and external beam radiation. IR decides to proceed with Y-90.
- CT chest was obtained for staging.

Y-90 Therapy for Unresectable HCC

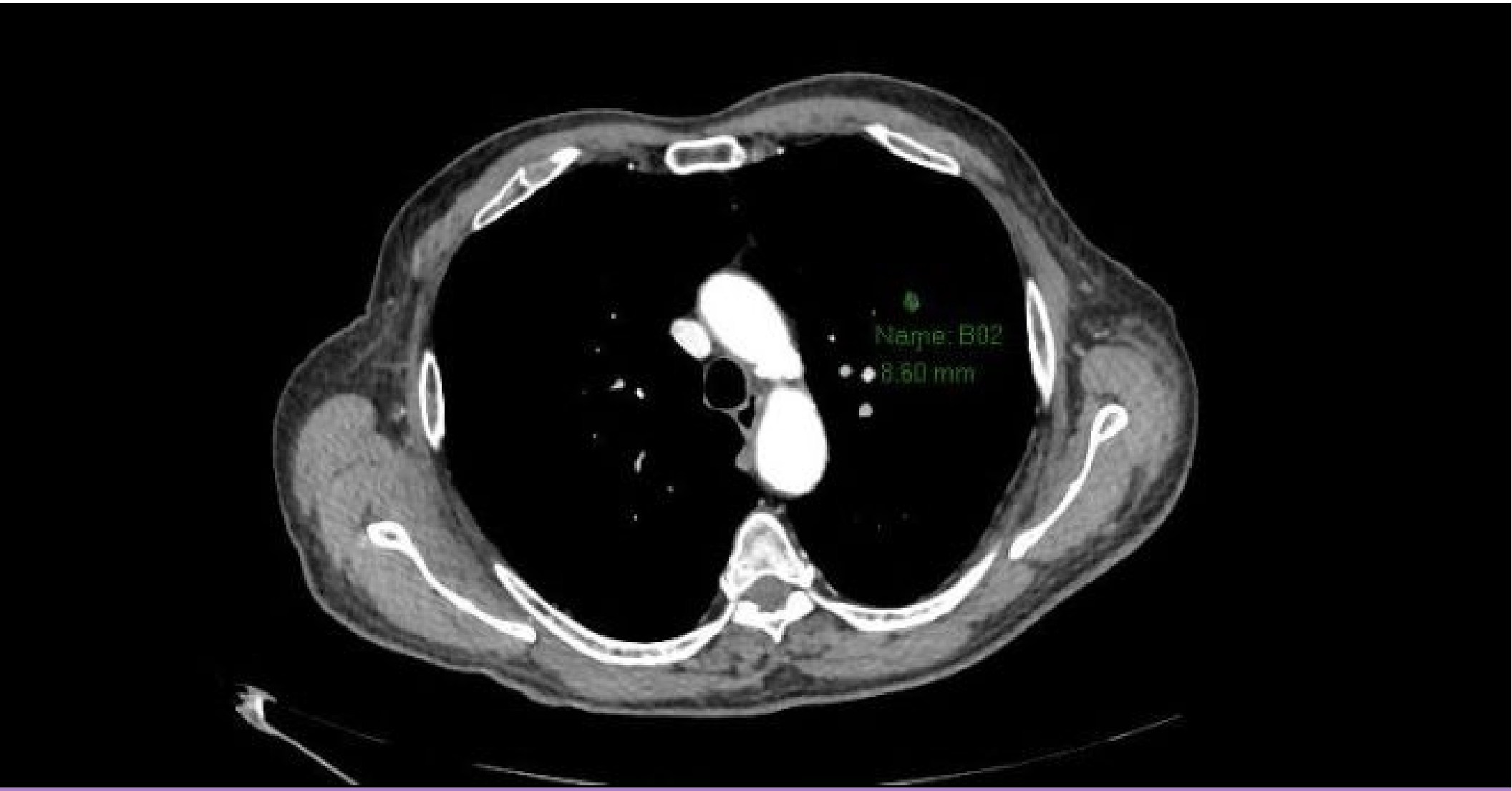


Y-90 resin microspheres are injected into hepatic artery. They become trapped in vessels around tumor and emit radiation.

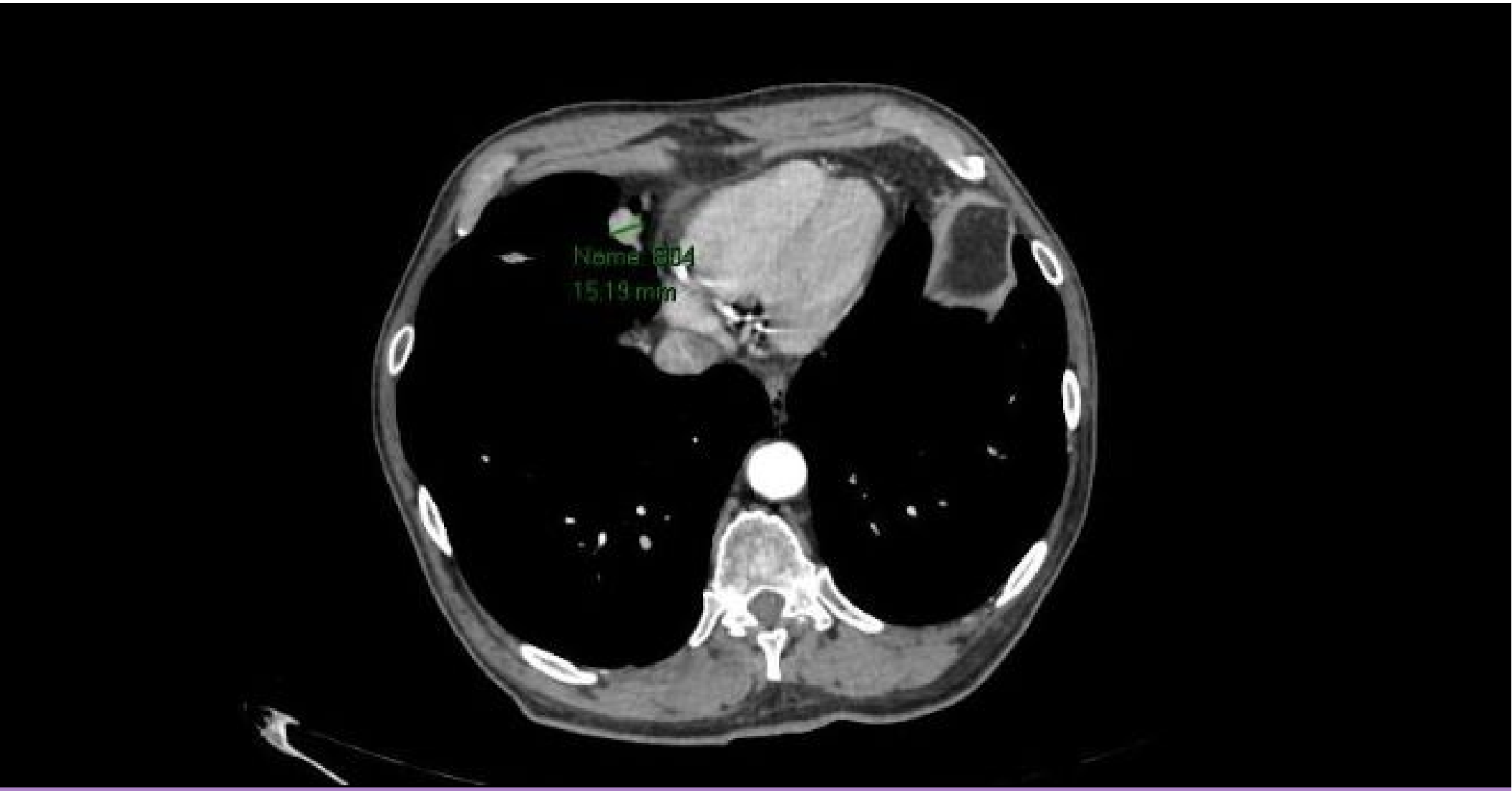
- Liver resection, liver transplantation, and ablation are considered potentially curative in select patients with HCC.
- Radioablation accepted to "bridge" patient to transplant, down-stage disease, and treat pt w/macrovascular invasion. Definitive in pts w/HCC limited to single liver segment.
- Survival benefit over chemoembolizaiton has not been demonstrated.

Image credit: Sirtex.com

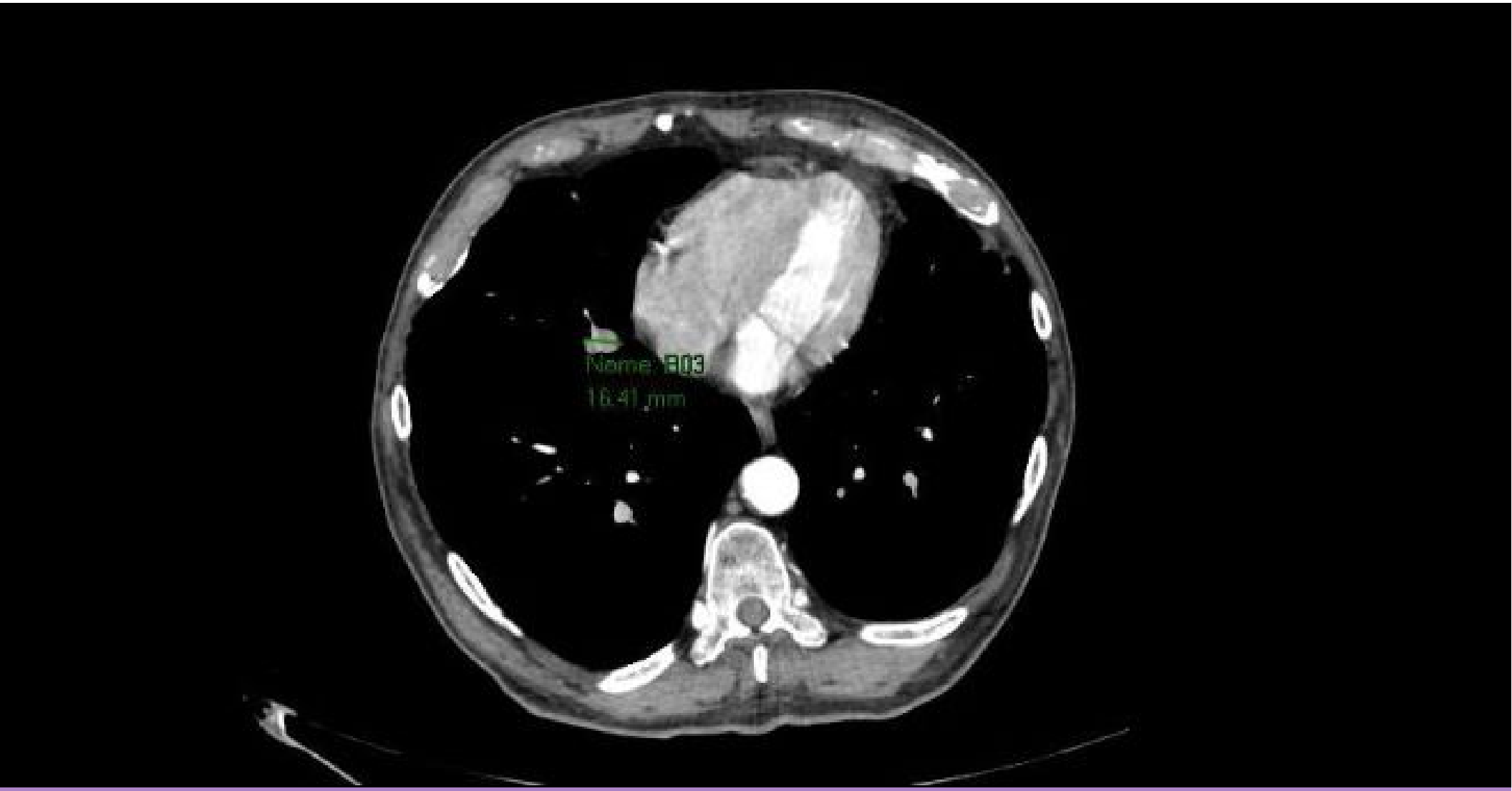
Padia SA, et al. Radioembolization of hepatic malignancies: Background, quality improvement guidelines, and future directions. *J Vasc Interv Radiol*. 2017.



7/17/17 CT Chest: LUL nodule (0.9 cm) w/internal fat density, no change since 2015, likely hamartoma.



7/17/17 CT Chest: RML nodule (1.5 cm) slowly increasing over past 2 years.



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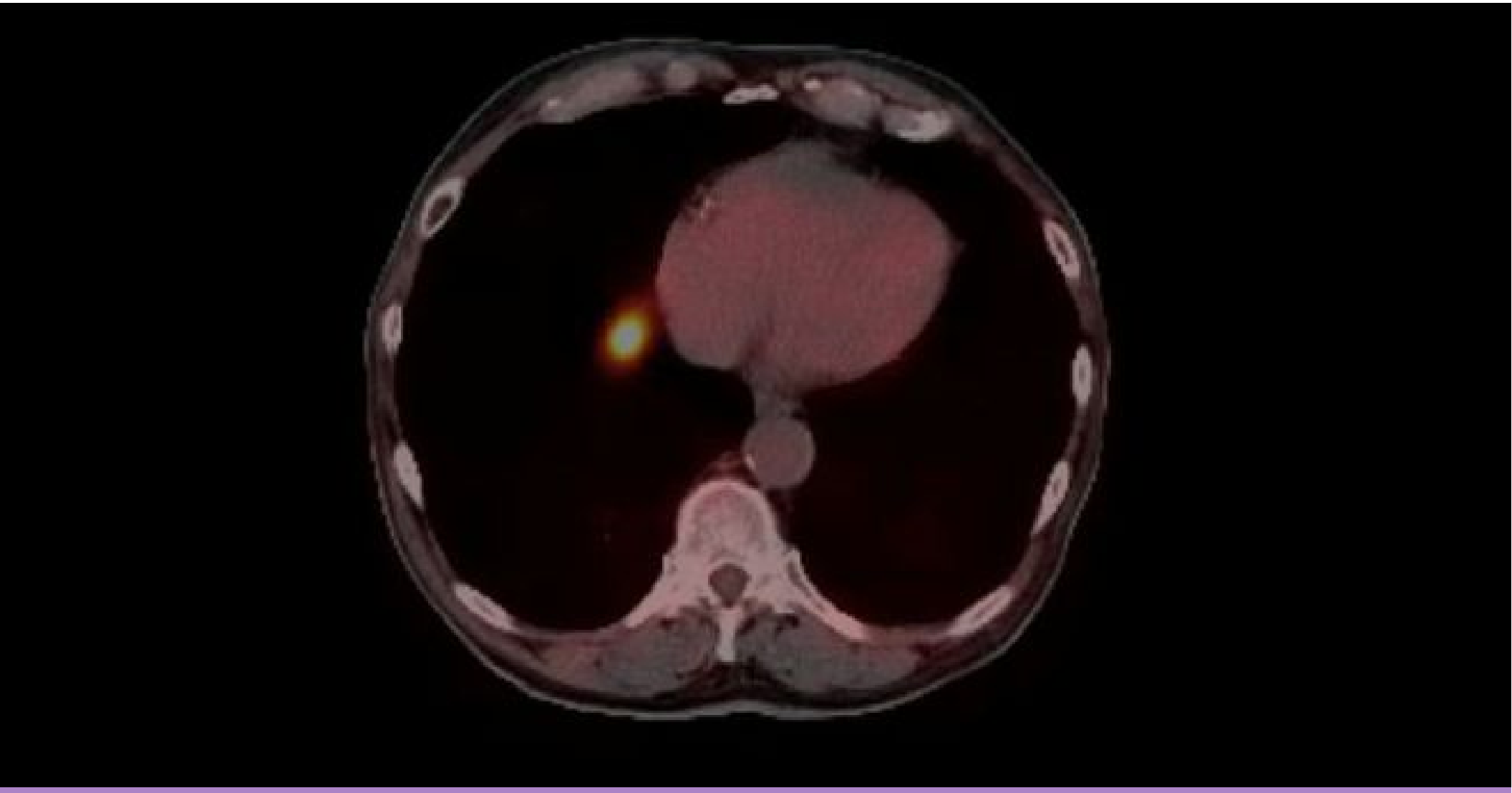


7/24/17 PET CT Chest: RML nodule (1.6 cm), slowly increasing over past 2 years, increased FDG uptake.

Differential Diagnosis

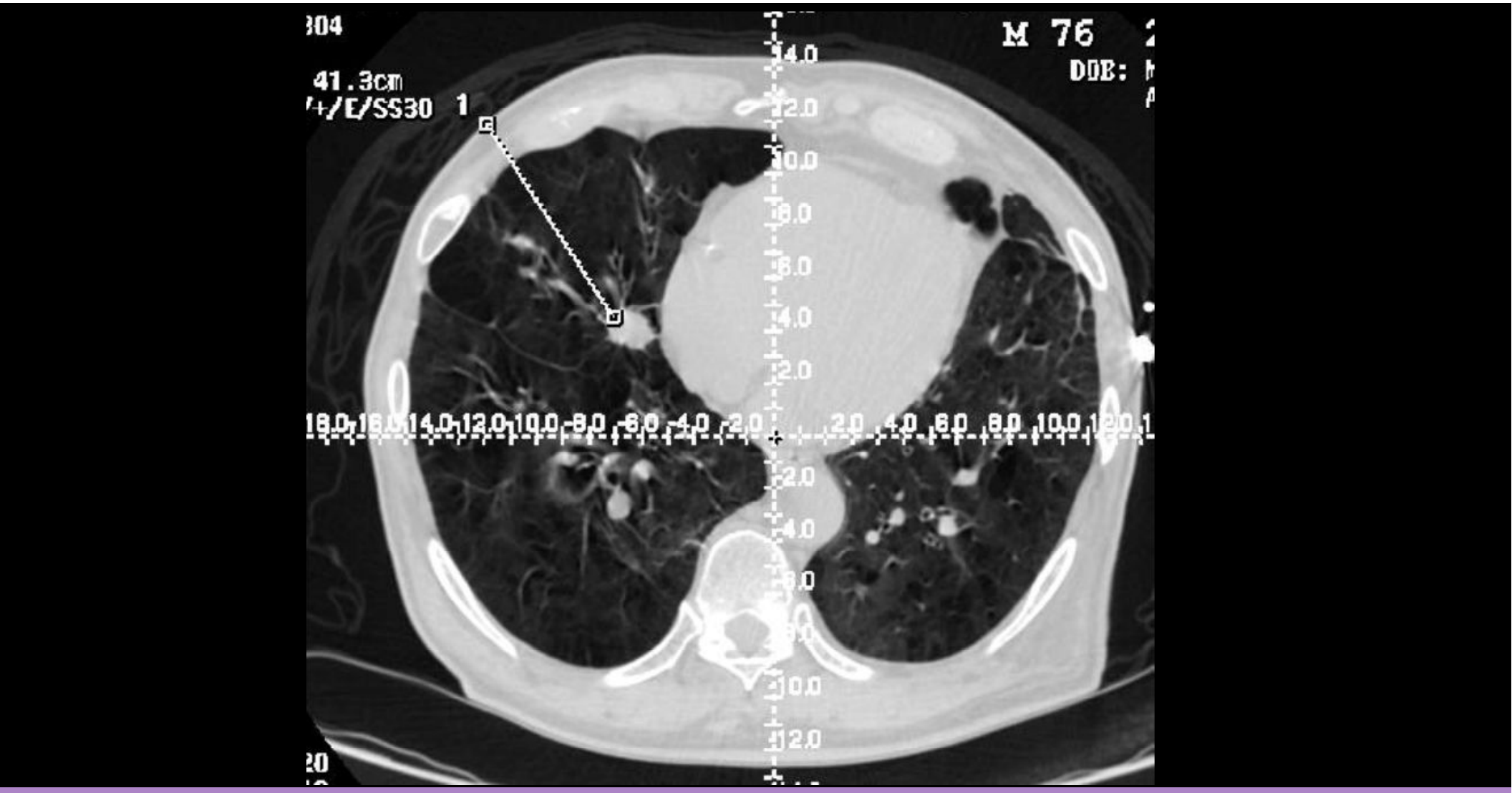
- Metastatic HCC
  - Most frequent site of first detectable met is lung (76% in this study of CT scans in 148 HCC patients (Extrahepatic Metastases of Hepatocellular Carcinoma, Gastrointestinal Imaging, 2000).
  - Multiple lesions may suggest mets; however, these have been present for 2 years and patient reports regular liver screening during that time w/o detection of HCC.
  - Mets from another unknown primary is also on the DDx.

Differential Diagnosis

- Primary Lung Cancer
  - Risk factors: smoker, emphysema, age (76) (though older than peak incidence 55-65)
  - 2nd most common cause of cancer overall
  - No reported symptoms (SOB, hemoptysis, weight loss, infection)
  - The 2 suspicious nodules are located centrally, classic location of squamous cell carcinoma. Small cell also classically central and with endobronchial growth. Small cell: fast growth → presents often with widely metastatic disease. Bronchogenic carcinoma also on DDx, as well as adenocarcinoma (most common in both smokers and non-smokers).
  - Infectious granuloma low on DDx: slow-growing w/o infx sx.

Procedure (August)

- CT-guided FNAs (x2) followed by core biopsies (x3).
- Patient developed a pneumothorax (high risk due to emphysema) immediately post-biopsy in spite of blood patch. Treated successfully with chest tube. Discharged home same day.



8/16/17 CT-Guided Lung Biopsy

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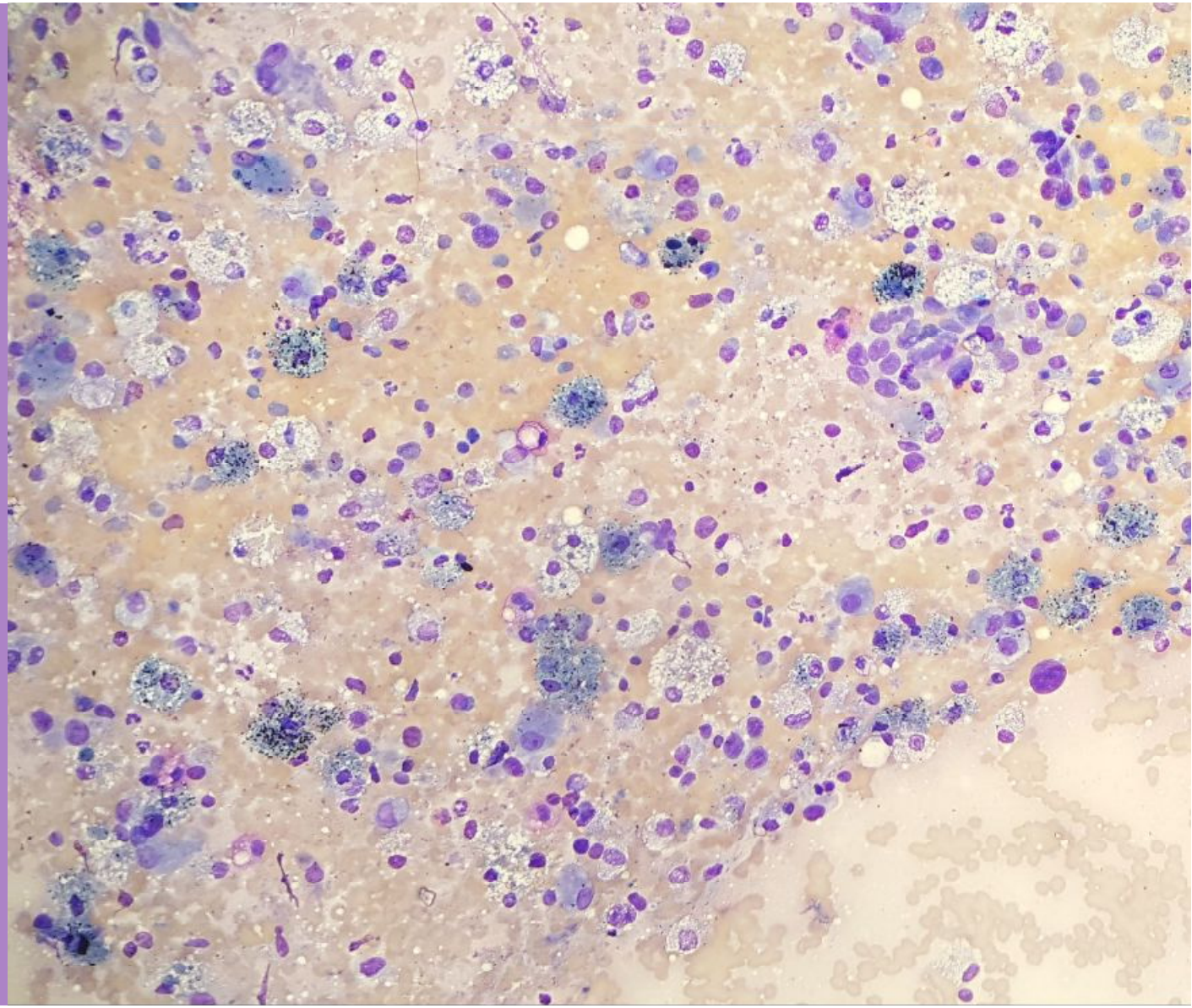
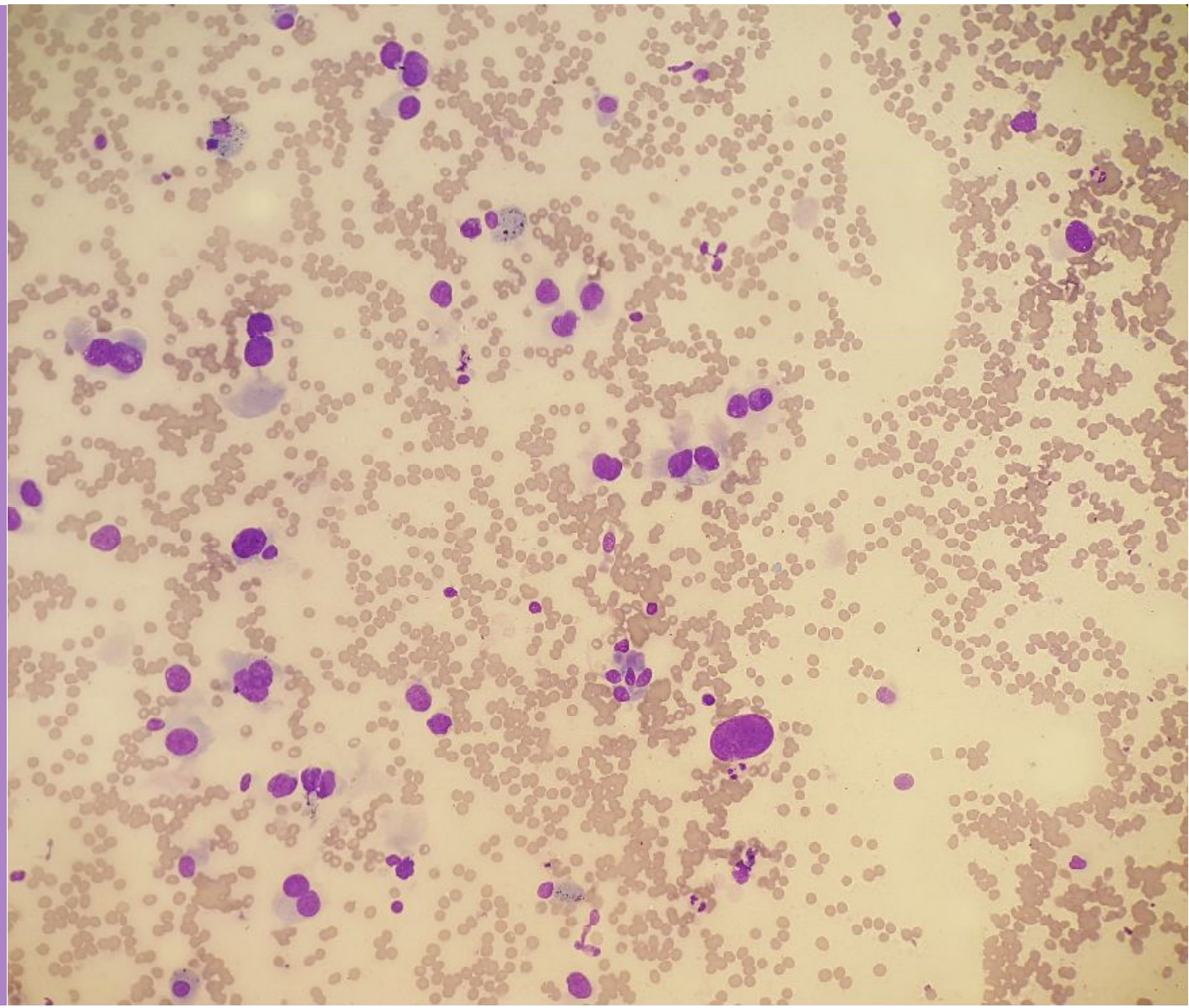
FNA

Pathologist interpretation on-site: Background of macrophages and bronchial cells with scattered large atypical cells, some with visible nucleoli. “Malignant.”



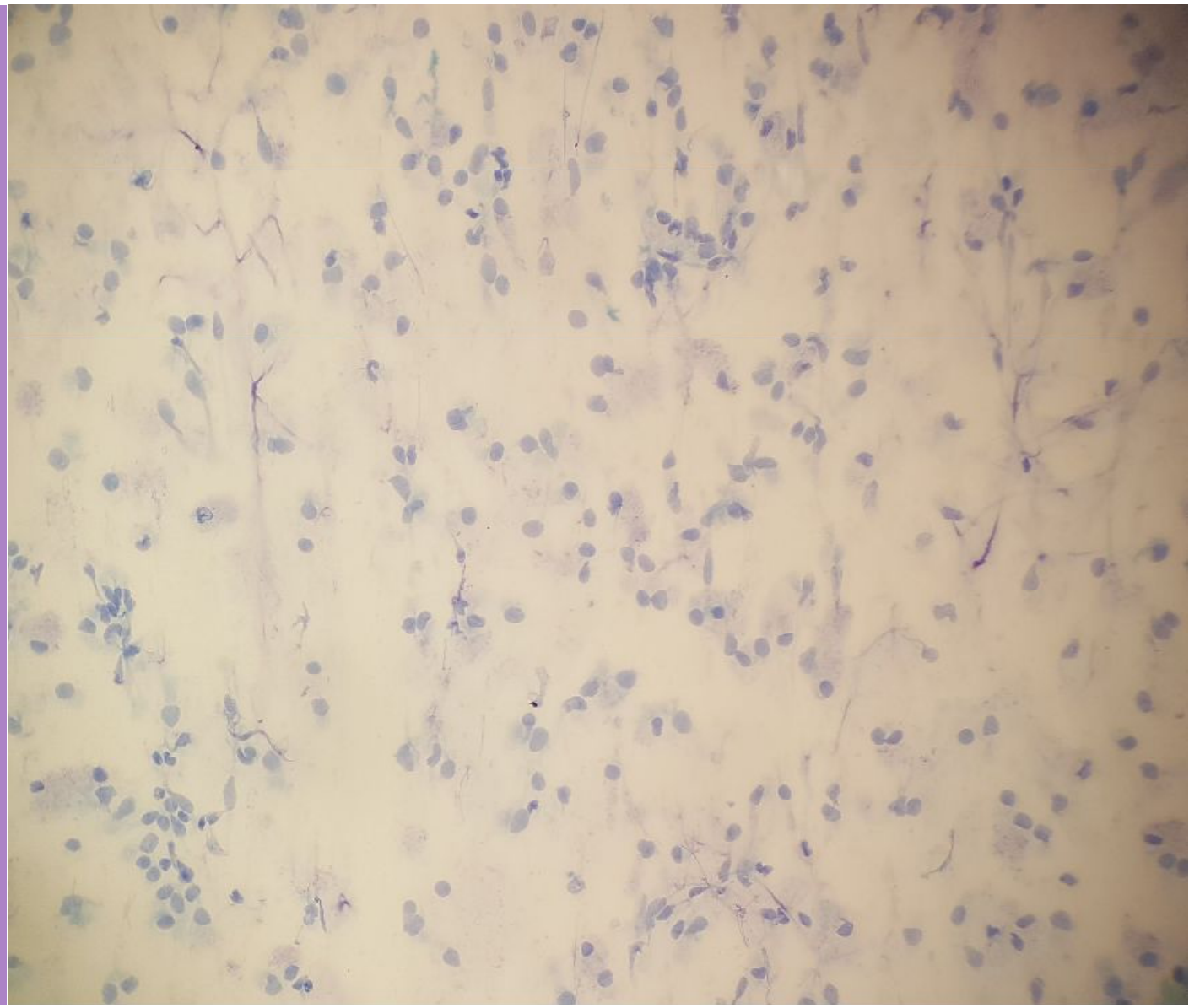
FNA

Large, pleomorphic nuclei. DDx includes poorly differentiated squamous cell carcinoma vs. melanoma vs. lymphoma (though probably too pleomorphic for lymphoma).



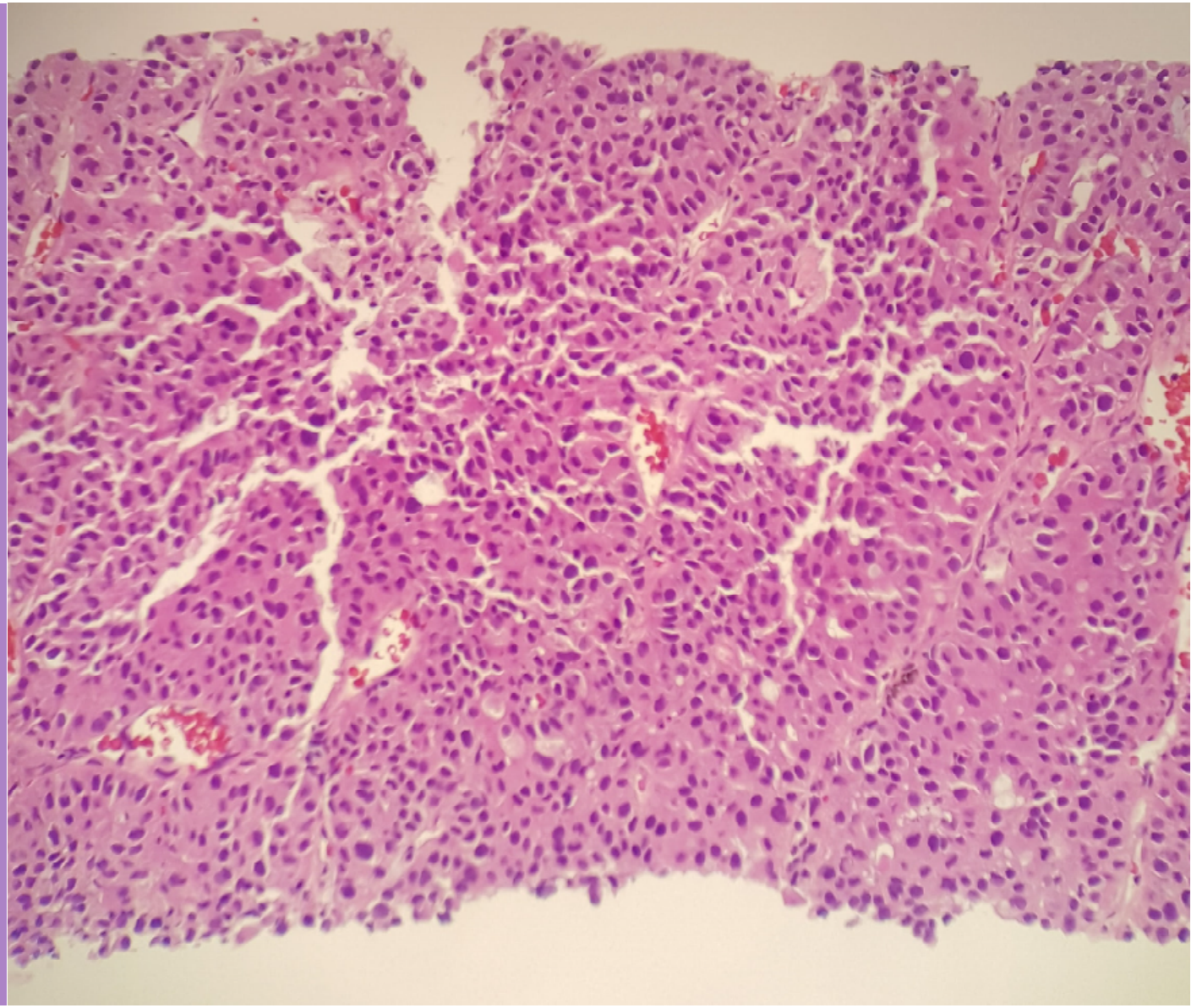
FNA

Normal bronchial cells (“bronchial contaminant”): discohesive, columnar cells with small nuclei. No cilia seen but presumably there.



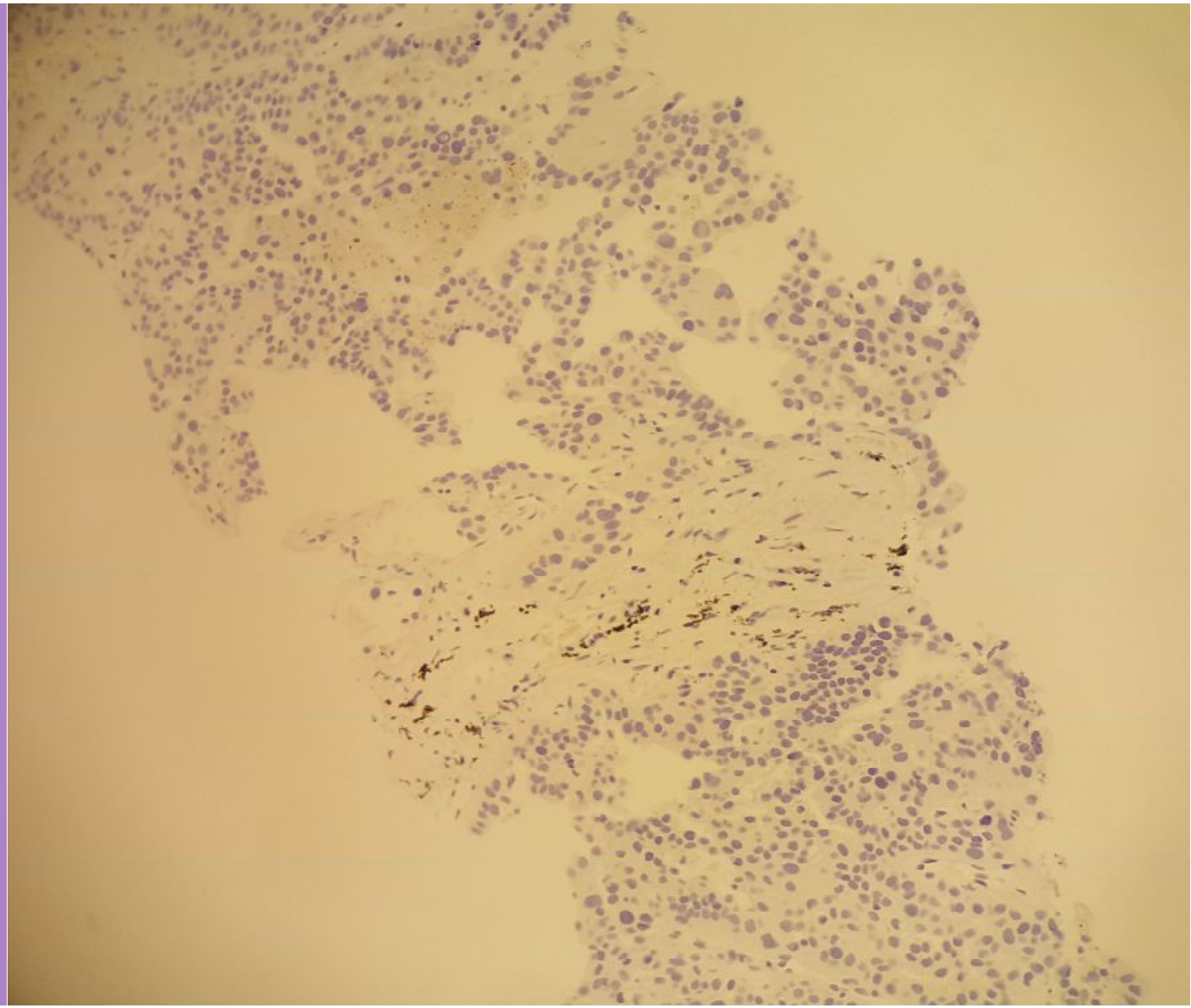
Core H&E

Does not look like normal lung (no air spaces). Ugly nuclei. Cells are gland-forming, suggesting adenocarcinoma. Eosinophilic cytoplasm looks hepatoid.



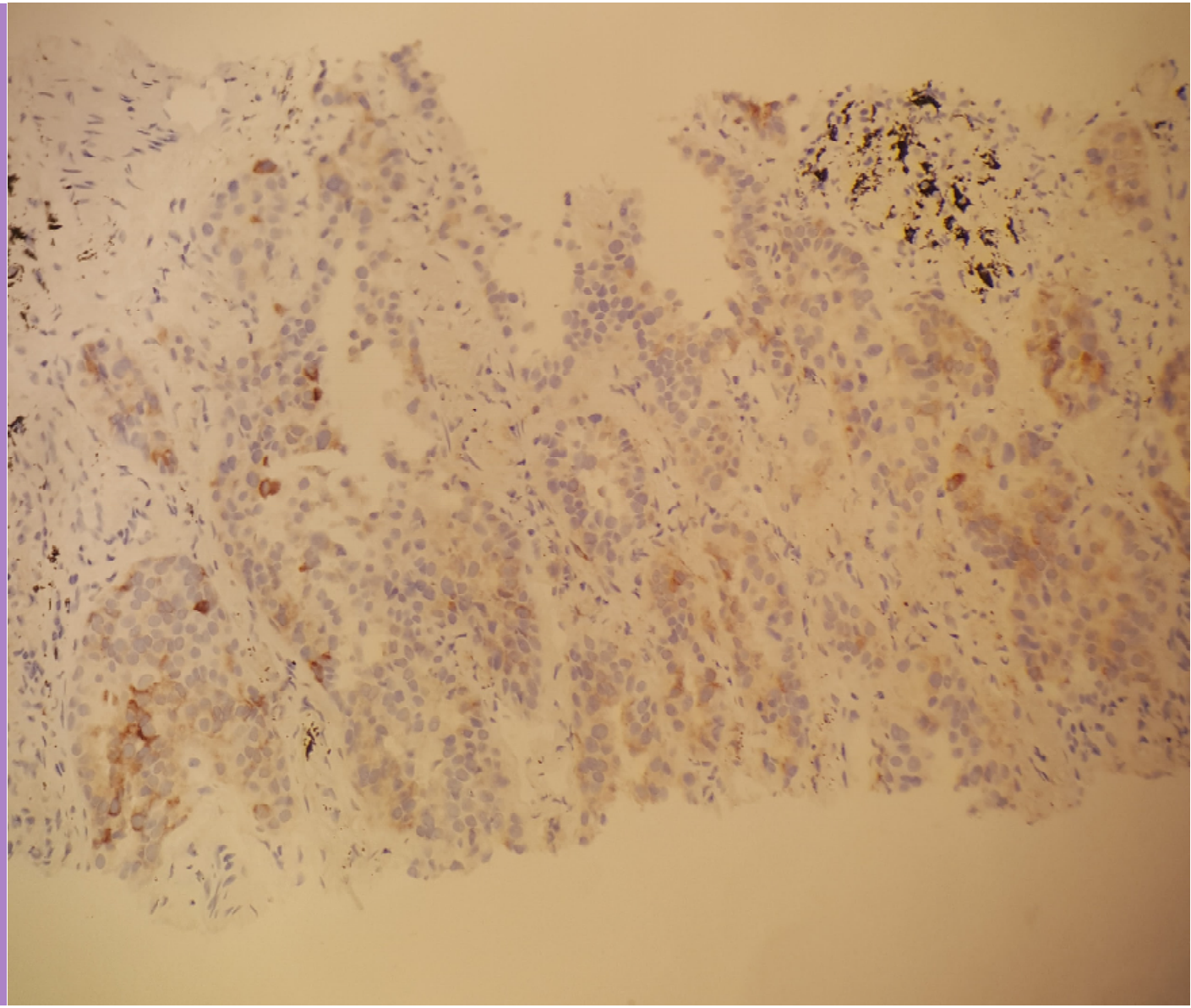
HEPPAR1

Negative. Stains normal and neoplastic liver.



Glypican

Weakly positive → interpreted as negative. Stains neoplastic but not normal liver.

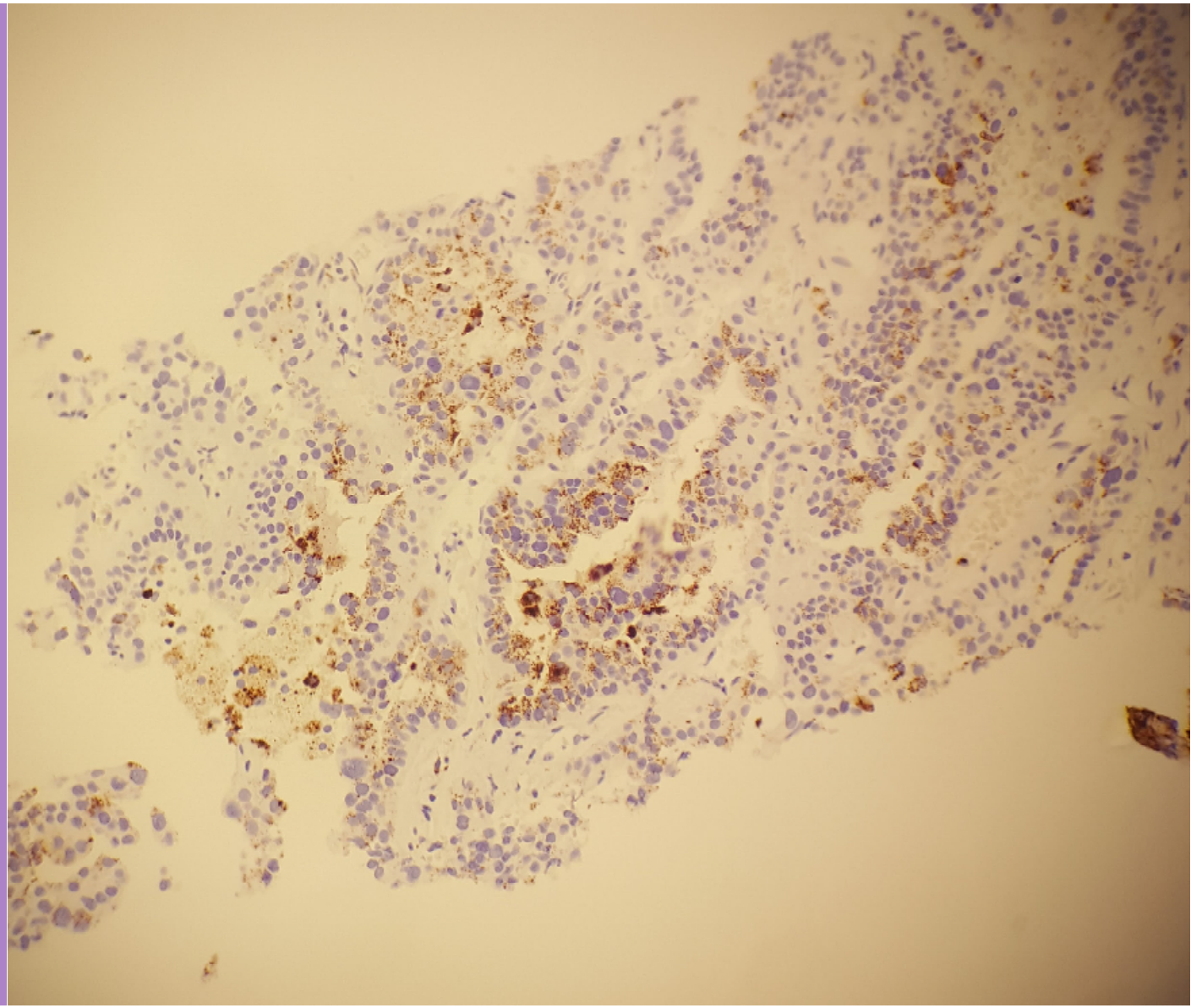


TTF

Strongly positive. Stains nuclei of lung adenocarcinoma but not squamous cell carcinoma.

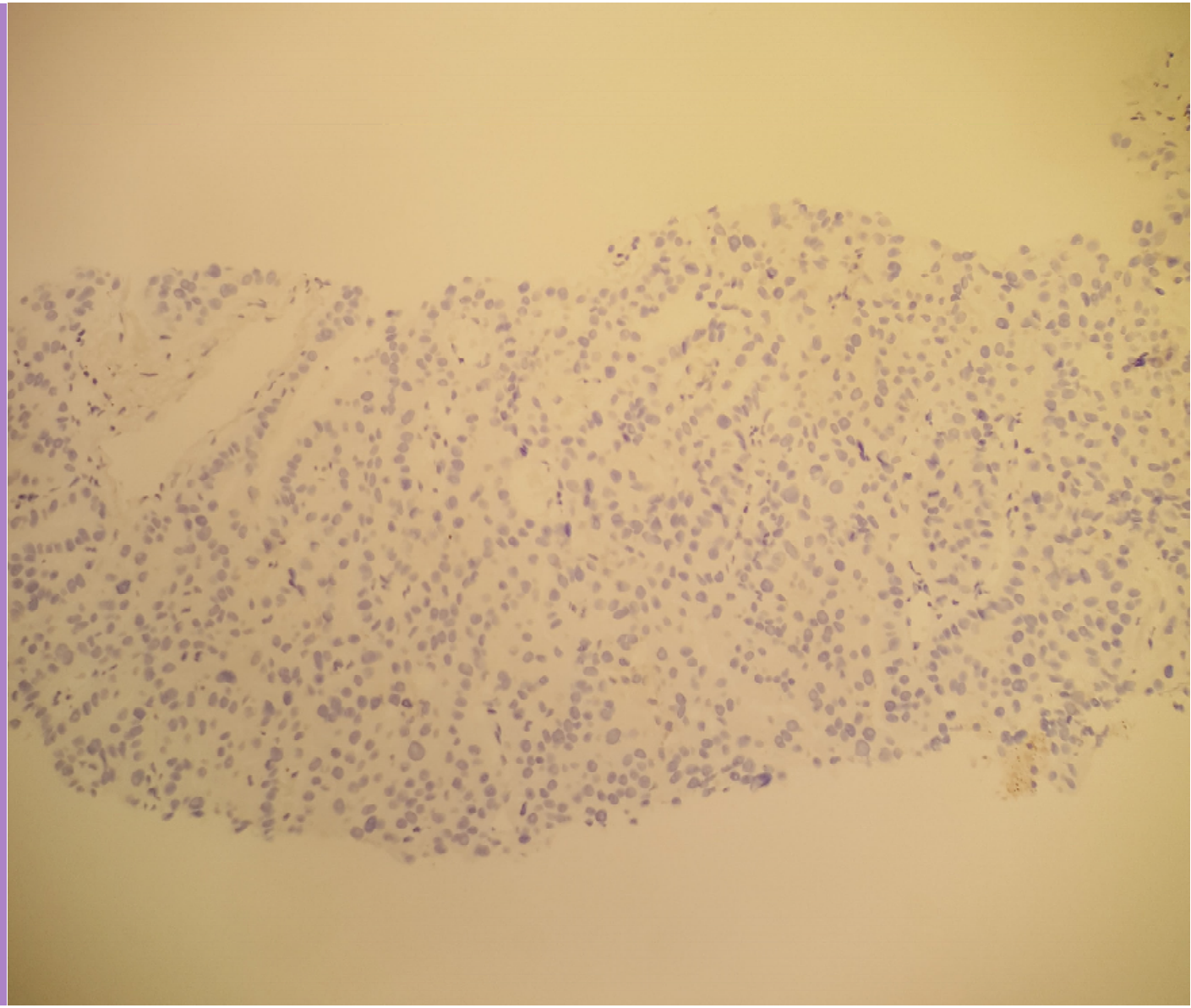
Napsin A

Positive. Stains lung adenocarcinoma.



PDL1

Negative. 0% show membranous staining. Potential target of immunotherapy against non-small cell lung cancers (and other cancers).



Final Diagnosis

- **Adenocarcinoma, compatible with primary lung adenocarcinoma.**
- Patient met with oncologist for biopsy results yesterday (no note yet in EPIC).
- Genomics Trusight Tumor Panel has sent to outside laboratory.