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Radiology Pathology Correlation

Case Presentation

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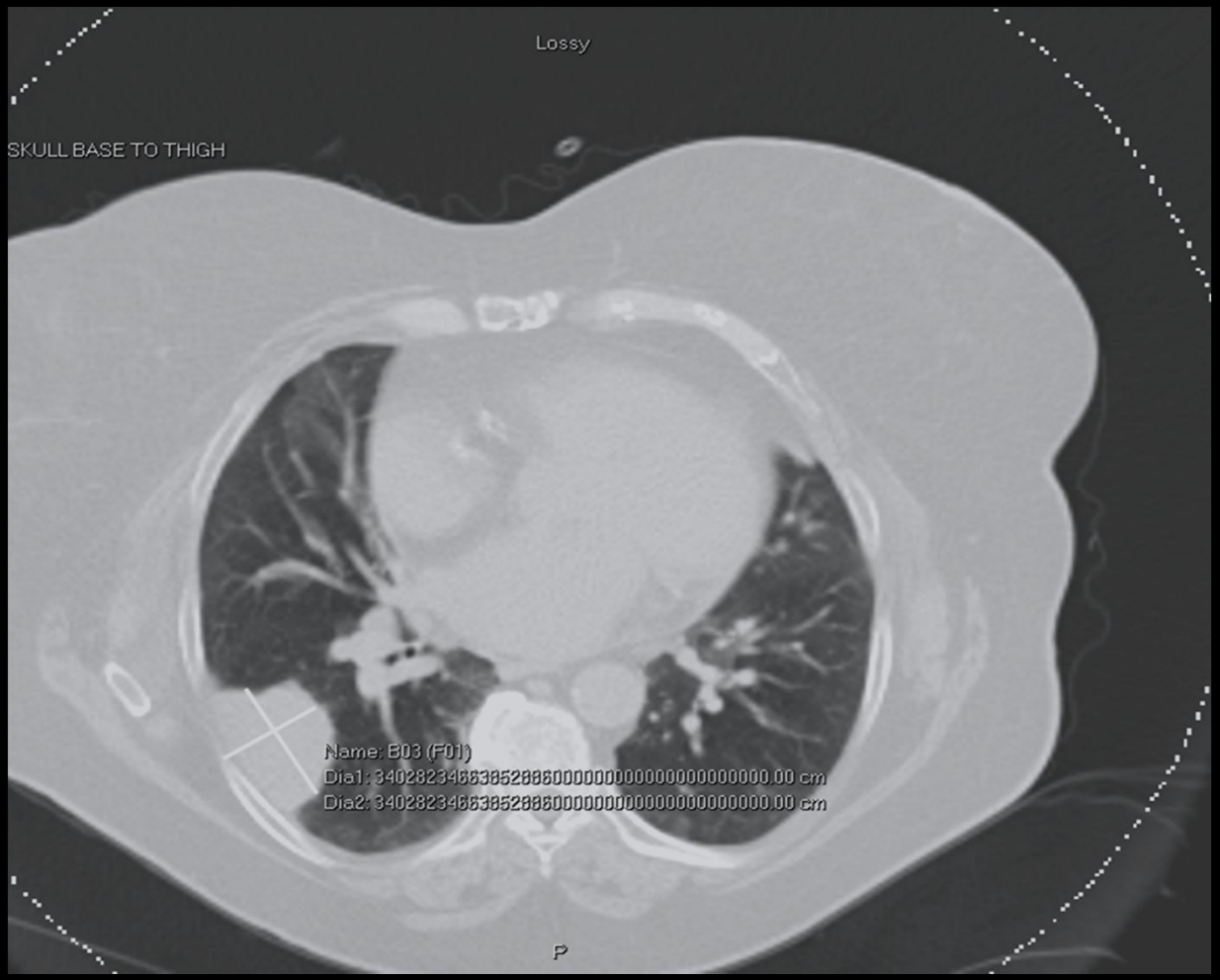
October 6, 2017

Patient: Ms. DR is a 62 yoF with history of tobacco use

- Initial presentation at outside ED
  - Chest discomfort with deep respiration
  - Negative for hemoptysis or sputum production
- Imaging work-up in the ED
  - Right lung mass, with possible mediastinal/hilar metastatic disease seen on CT chest
- Past Medical History
  - DM, HTN, HLD
  - Coronary artery disease s/p MI and stents x2, on ASA & Plavix
  - COPD/ chronic respiratory failure on home O2 since Nov. 2016
  - Atrial fibrillation (not on anti-coagulation)
- Social History
  - Smoked for 42 years; quit 6 years ago. No EtOH use

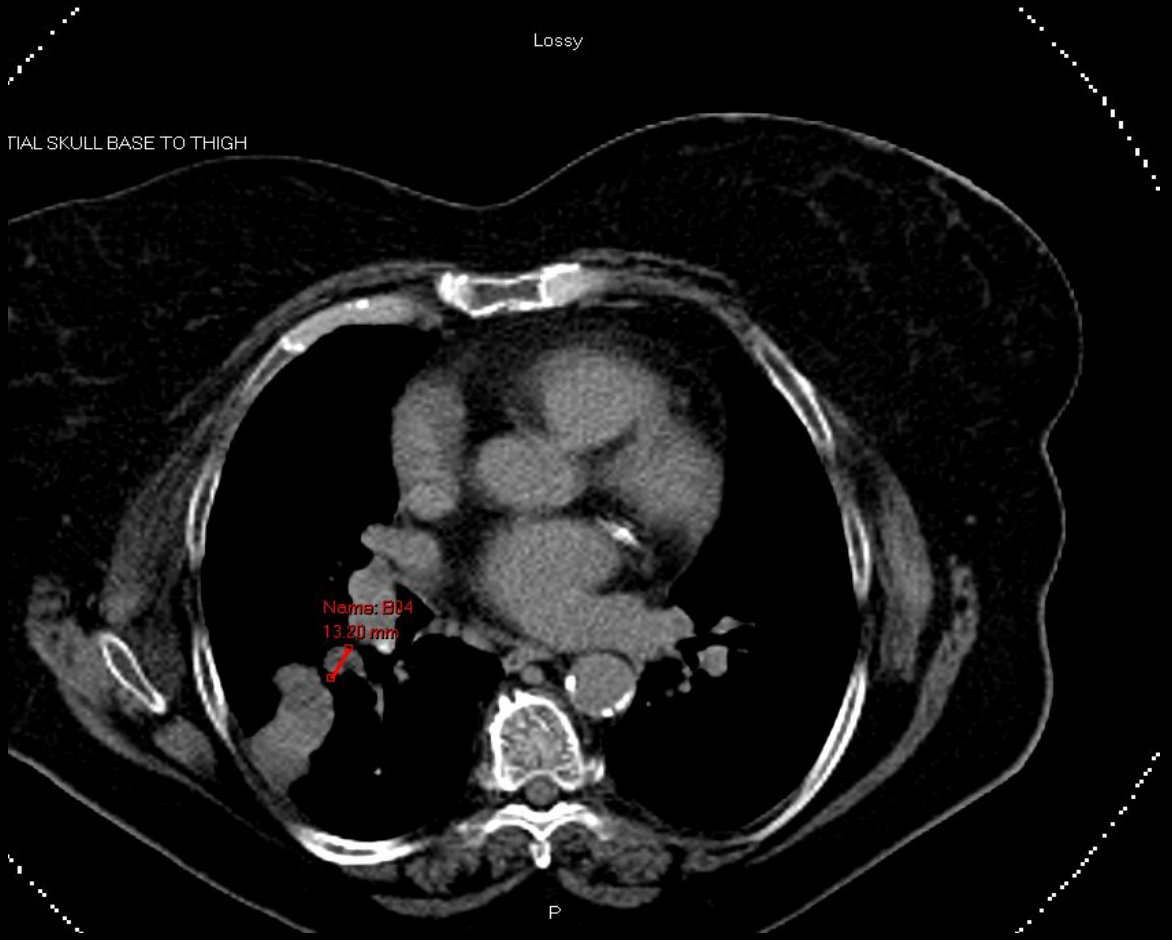
Imaging

Whole Body CT 9/6/17



- RLL subpleural 4.9 cm x 3.9 cm mass (previously 3.4 x 2.9 cm on June 11, 2017)

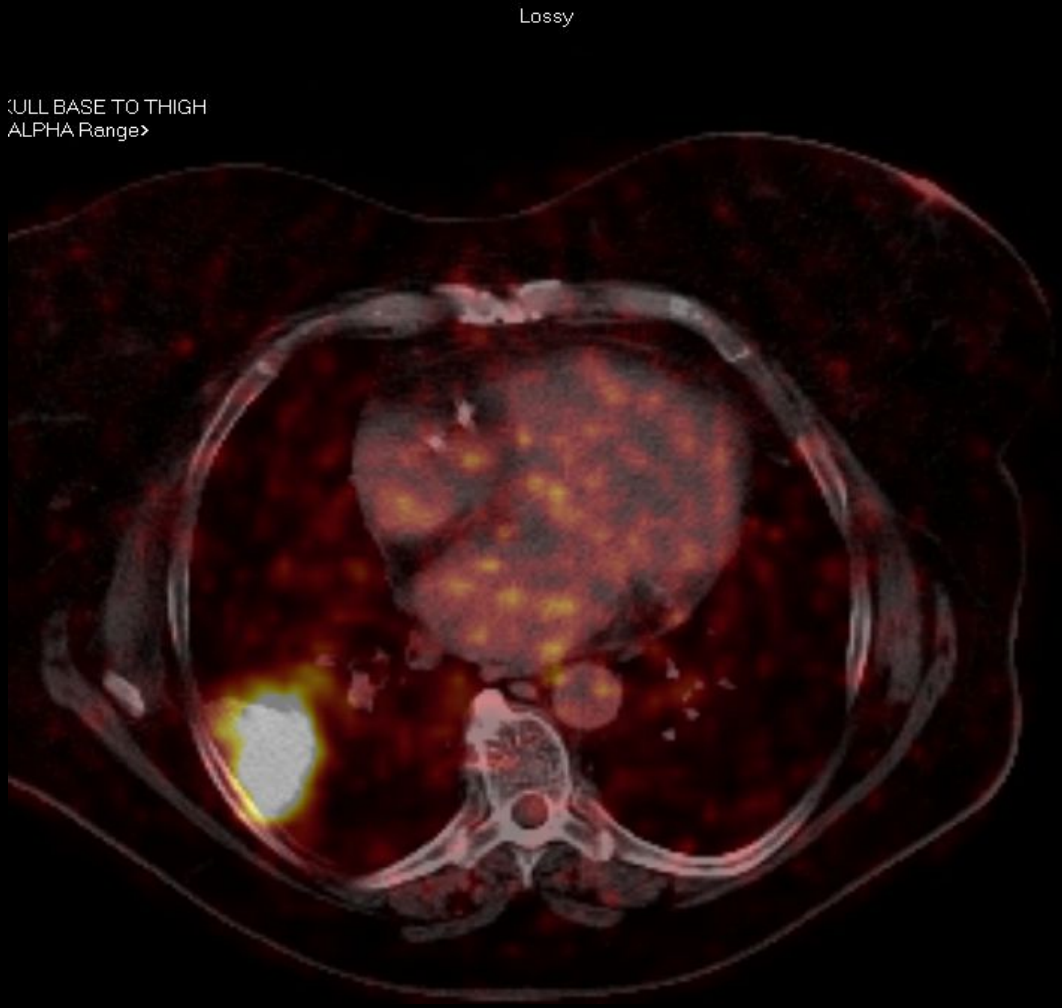
Imaging



- Perihilar solid nodule adjacent to the aforementioned mass, concerning for contiguous metastatic focus

Imaging

PET CT



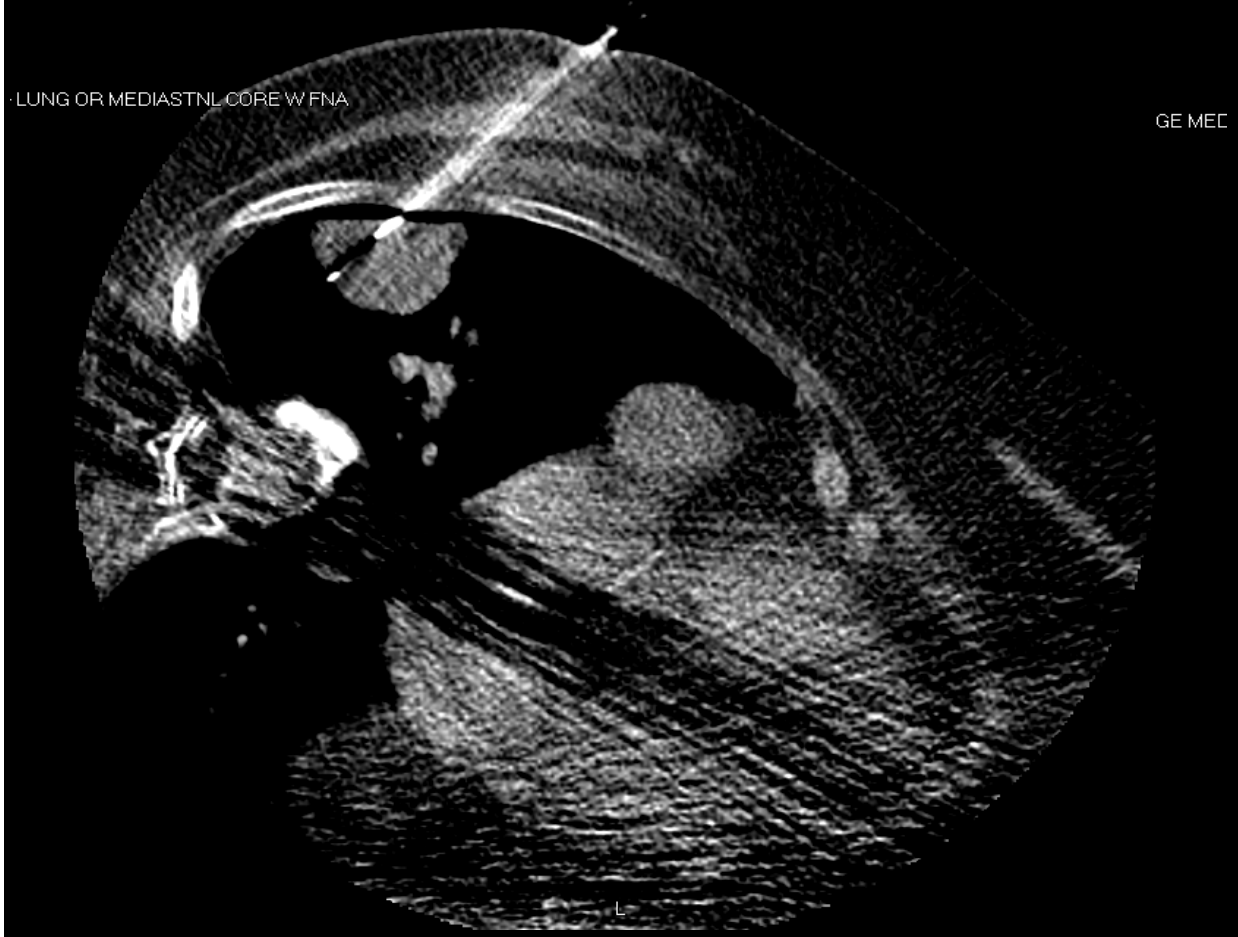
Right lower lobe FDG avid lung mass, increased in size from the prior, highly suspicious for primary malignancy.
No evidence of suspicious mediastinal or hilar adenopathy.

Pre-Procedure

- Informed consent obtained
- Labs:
  - INR 0.9
  - Platelets 122
  - Hb 11.8/ HCT 27.2
- Patient had panic attack right before biopsy; evaluated by attending
- Received conscious sedation; became calm
- Confirmed her wish to proceed with lung biopsy

Biopsy

9/25/17



- CT-guided core biopsy with FNA of RLL subpleural mass
- Posterolateral approach
- Patient on left side
- FNA x 1, 22-gauge
- Core x 5, 18-gauge

- Post-Procedure: pt monitored for 1 hr, no complications

FNA Results

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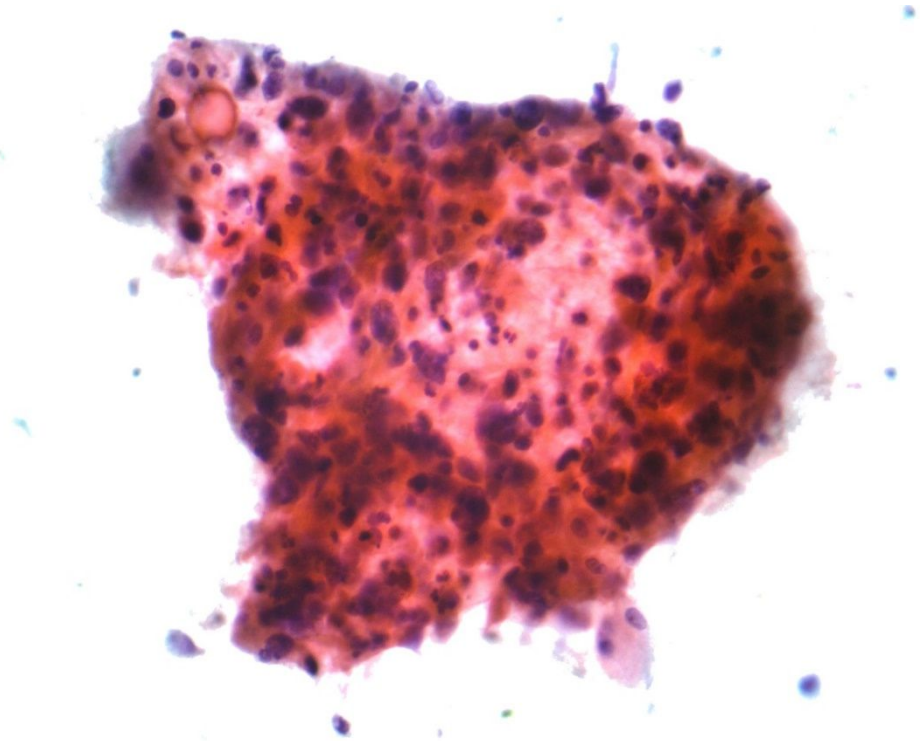
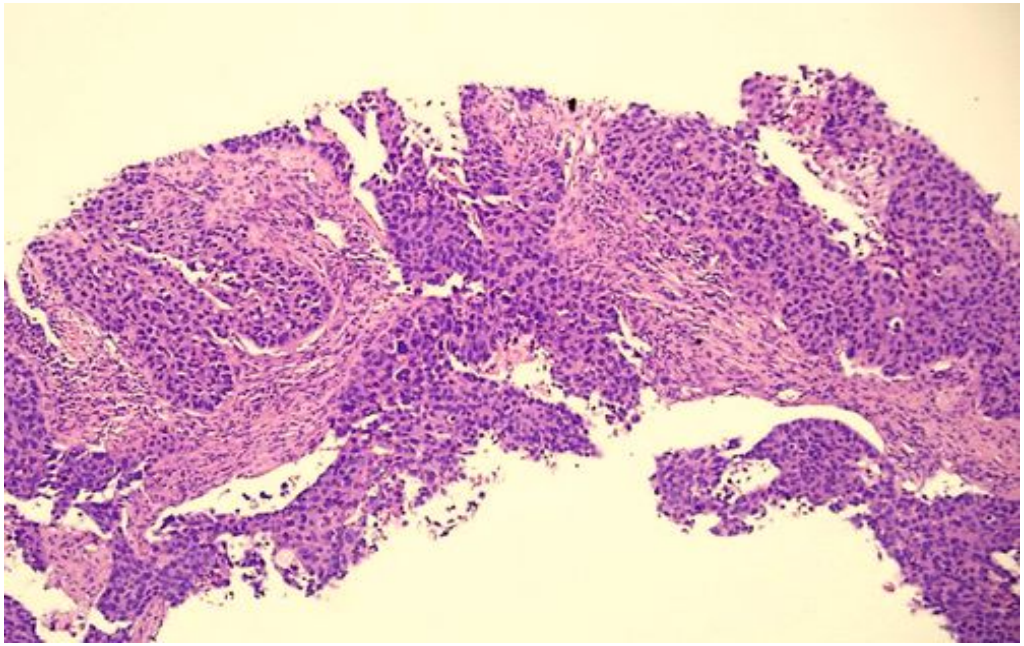
- Cohesive, medium-sized cells
- Arranged in clusters
- Abundant cytoplasm, eosinophilic
- Moderate pleomorphism
- Coarse, hyperchromatic nuclei



Core Biopsy Results



- Nests of cells
- Intercellular bridges
- Keratinization
- Final diagnosis: squamous cell carcinoma
- *No additional staining needed for diagnosis*

Immunohistochemistry

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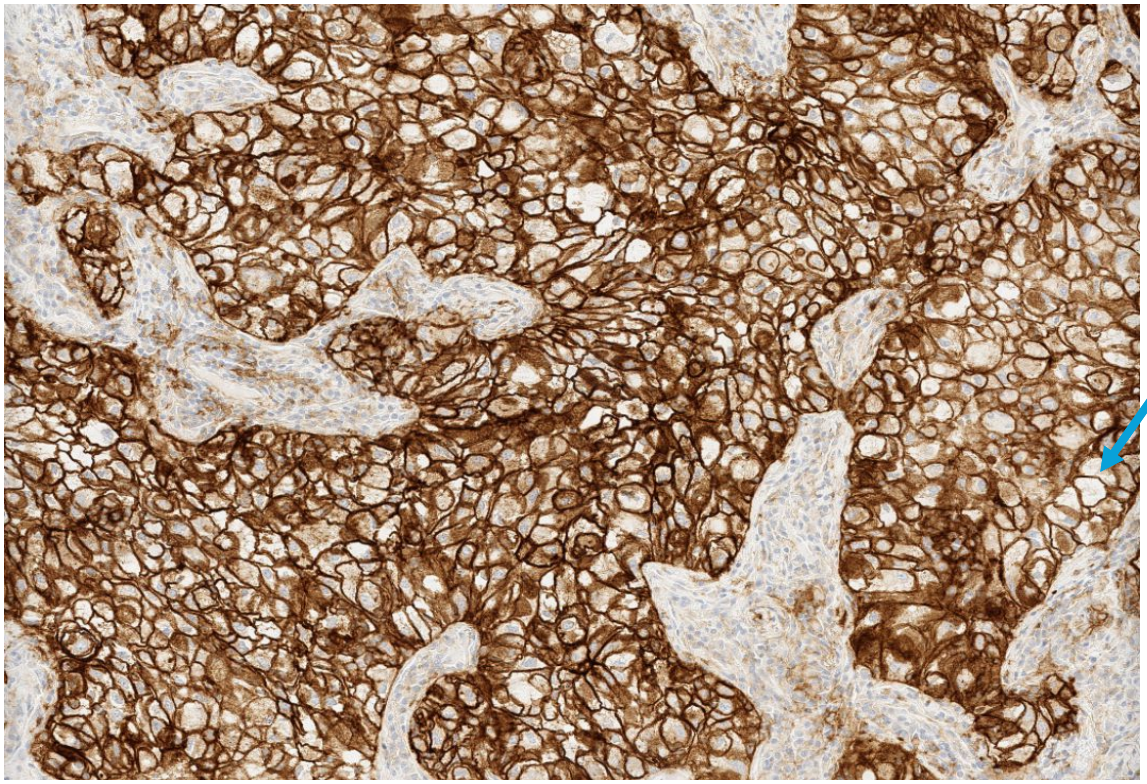
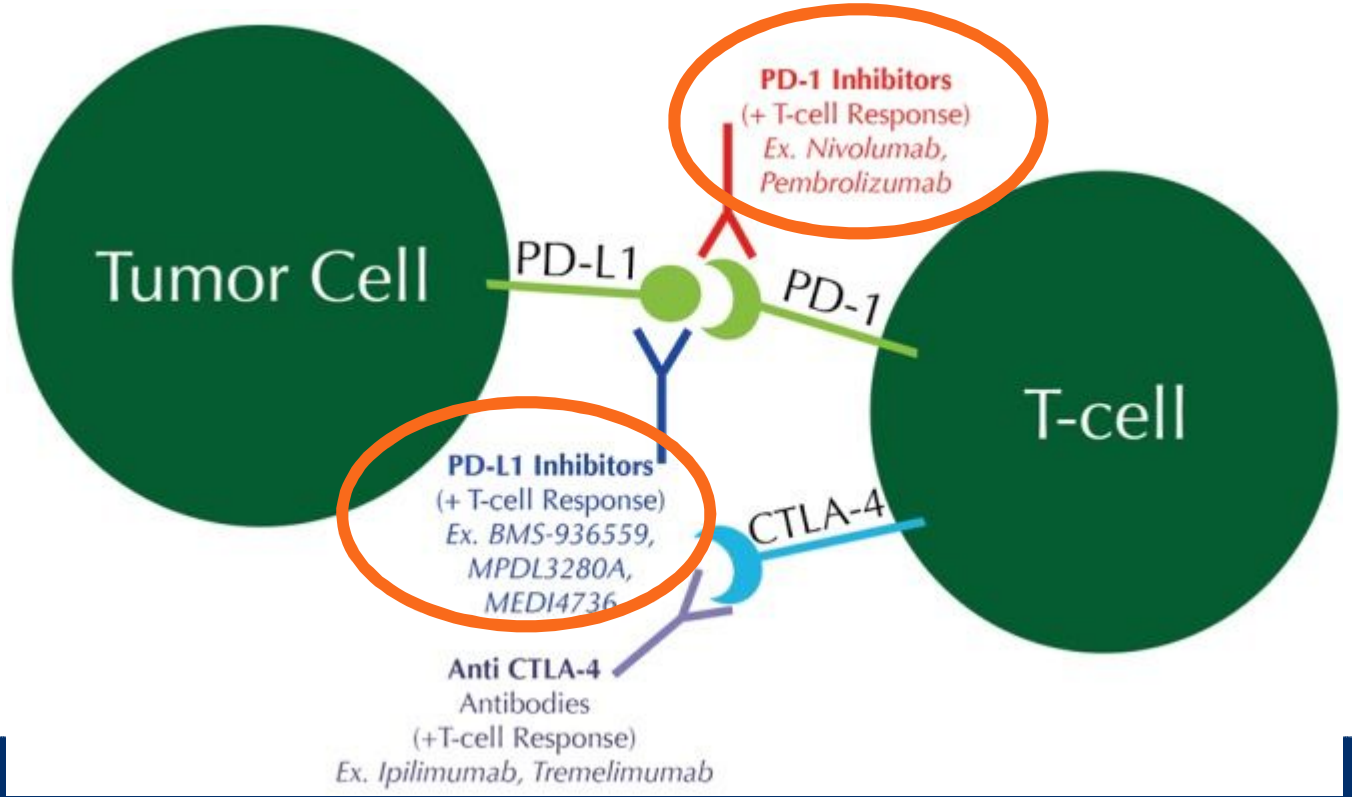
PD-L1



- Strong positivity (3+/3) in approximately 100% of tumor cells

PD-L1

- Programmed cell death ligand-1
- Expressed by tumor cells, interacts w/ PD-1 on T cells, triggers CTLA-4 pathway
- Leads to suppression of anti-tumor T-cell response
- Tumor escapes immune surveillance



Squamous Cell Carcinoma

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- High correlation with smoking history; more common in men
- Gross pathology:
  - Tend to arise centrally in major bronchi, eventually spread to local hilar nodes; may be peripheral!
    - Predominant in peripheral: emphysema, interstitial fibrosis, entrapped pneumocytes inside tumor
  - Large lesions may undergo central necrosis, leading to cavitation
  - Symptomatic stage: mass obstructs lumen of major bronchus → distal atelectasis & infection; lesion also invades surrounding lung parenchyma
  - Extra-thoracic dissemination takes longer than other histologic types do
  - Histologically, ranges from well-differentiated (keratin pearls, intercellular bridges) to poorly differentiated

Squamous Cell Carcinoma

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- TNM Staging
- Our patient:
  - Tumor: 4.9 cm in greatest dimension = T2b
  - Nodes: N0
  - Metastases: M0
  - At least Stage IIa
- Treatment:
  - Surgical resection is standard treatment for Stage I & II in surgical candidates
  - Adjuvant chemotherapy indicated for Stage II disease
    - E.g. Platinum-based (cisplatin)

Squamous Cell Carcinoma

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- New, promising treatments:
  - Immunotherapy (e.g. anti-PD-L1 & anti-PD1)
  - Most clinical trials so far study response in advanced disease, post platinum-based therapy

Results of randomised phase III trials of immune checkpoint inhibitors (ICIs) for advanced non-small-cell lung cancer (NSCLC).

Line of treatment	Drug	Trial	PDL1 selection	ORR	PFS (months)		OS (months)	
					Median	HR	Median	HR
L1	Pembrolizumab	Keynote-024	≥50%	45%	10.4	0.50	NR	0.60
	Nivolumab	Checkmate-026	≥5%[a]	26%	4.2	1.15	14.4	1.02
L2 and beyond	Pembrolizumab[b]	Keynote-010	≥1%	18%	4	0.79	12.7	0.61
	Pembrolizumab[b]	Keynote-010	≥50%	29%	5.2	0.59	17.3	0.50
	Nivolumab	Checkmate-017	No	20%	3.5	0.62	9.2	0.59
	Nivolumab	Checkmate-57	No	19%	2.3	0.92	12.2	0.73
	Atezolizumab	OAK	No	14%	2.8	0.95	13.8	0.73

Abbreviations: ORR, overall response rate; PDL1, programmed death-ligand 1; PFS, progression-free survival; OS, overall survival; HR, hazard ratio; L1, first-line; L2, second-line.

Case Follow-Up

- Followed by UVA Pulmonology
- In contact with Emily Couric Cancer Center
- Referred to Cardiothoracic Surgery on 9/28/17

Thank you!

References

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Questions?