

Lung 2022 Case Scenario/Jeopardy

Case #1

12/02/2021 Outside Facility – CT lung screening – No pulmonary nodules seen throughout the lungs bilaterally. Moderate to severe emphysema with an upper lung predominance. No adenopathy, no pleural effusions.

01/02/2021 Outside facility – Chest xray for SOB – questionable 1.9 cm nodular density in the left mid lung, followup studies may be helpful to further evaluate.

1/10/2021 – Outside Facility – CT chest – Moderate size nodular mass 31 x 30 mm, seen in the lingula, possibility of this representing neoplastic process needs to be considered. No other findings.

02/01/2021 A 72-year-old female with an 85-pack-year history of cigarettes presents with a newly discovered lingular mass. Pt had CT lung screening scan 12/02/2020 that showed no nodules, but presented to her primary care in January with worsening shortness of breath, chest xray was done followed by CT chest. She has moderate emphysema, no pulmonary nodules. The lingular mass has not been biopsied, but is most likely a malignancy. Discussed the natural history of lung neoplasms and diagnostic treatment options. She does not want to proceed with surgery (and is not a good candidate as she likely would not tolerate lung resection well). Recommend completing diagnostic workup and consult with radiation oncology about SBRT.

PET SCAN – Lingular mass 4.1 x 3.5 cm with SUV max 22.5 and appears to abut the lingular bronchus. No definite PET evidence of additional FDG Avid lung nodules. Few scattered left axillary level 1-2 nodes without pathologic anatomic features.

EBUS with biopsy - LUL endobronchial biopsy – Poorly differentiated squamous cell carcinoma.

FNA Station 7 node – lymphoid elements (no malignancy)

FNA Station 11L node – scant lymphoid elements and bronchial cells (no evidence of malignancy)

MRI brain negative

Patient found not to be a surgical candidate due to emphysema. Recommend to proceed with radiation to the left lung with 60 Gy in 8 fractions delivered on the MR linac with daily adaptive therapy given the central location.

Treatment Summary: Radiation Oncology - Course: 1 Protocol:						
Treatment Site	Current Dose	Modality	From	To	Elapsed Days	Fx.
L Lingula	6,000 cGy	x06	xx/2021	xx/2021	9	8

Dose was very high, so must check to see if SBRT or something else

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RADIATION TREATMENT PLANNING NOTE:

The patient is to be treated to a total dose of 60 Gy in 8 fractions of 7.5 Gy each using IMRT. IMRT is necessary so as to achieve acceptable Dose Gradient and Conformity Index and reduce dose to critical surrounding normal structures. A MR-gated approach will be taken to limit dose to normal organs at risk.

Note in the EMR from each of the 8 days the patient received radiation

A new MRI was obtained today. Upon review, I recontoured all structures and determined that there were anatomic and tumor changes. I then predicted the original dose on today's images and a new IMRT plan was required based on poor tumor coverage by the prescription dose. IMRT was required due to close proximity to normal structures, dose escalation, and narrow margins. I reviewed the new optimized plan and it was acceptable for treatment. QA was performed and patient was treated with the new optimized plan.

Patient with high risk stage IIA PD NSCLC, SCC histology, cure rate is significant for XRT alone but because of her high risk features chemotherapy can offer additional benefit in our goal of curative intent. Discussed the use of carboplatin + gemcitabine every 3 weeks for 4 cycles (completed all 4 cycles but dose reduced due to thrombocytopenia).

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Case #2

Patient with a history of CLL, followed with scans. Recently presented to the ER for hemoptysis and SOB. Based on imaging findings, patient had biopsy of LUL nodule c/w NSCLC/SCC. He has a history of recurrent pleural effusions associated with the treatment for the CLL.

1/8/2021 – PET CT – Interval increased hypermetabolic uptake involving malignant mediastinal and hilar nodes from prior PET CT. New peripheral nodules and cavitory lesions demonstrating increased uptake, suspicious for septic embolism. Malignancy is also a possibility. Small right greater than left loculated pleural effusions, decreased from recent chest CT. No malignant adenopathy in the neck, abdomen or pelvis.

02/03/2021 CT CHEST – Left upper lobe mass, not apparent on prior CT from 2020, 3.9 x 2.7 x 2.5 cm. Associated with occlusion or possible invasion of LUL bronchus suggesting either post obstructive pneumonia or lymphangitic carcinomatosis. (PET positive mass 01/08/21 has increased in size and infiltrates were not present on prior PET). Right apical lung 8 mm pulmonary nodule (4.4 mm on January scan), RUL anterior segment subpleural nodule 7 mm (not seen on prior imaging). LUL 15 mm pulmonary nodule (prior scan was only 5 mm), LUL 9 mm pulmonary nodule not apparent on prior imaging. Mediastinal and hilar adenopathy not present in 2020, some are increased in size compared to January PET. Persistent at least partially loculated right greater than left pleural effusions, no significant change in overall size.

02/04/2021 LUNG, LEFT UPPER LOBE NODULE, BIOPSY:

Non-small cell carcinoma, consistent with squamous cell carcinoma (see comment).

Comment

Immunohistochemical stains received for review with adequate controls show tumor cells positive for CK7, CK5/6, p40 and negative for CK20, TTF-1 and synaptophysin.

SCC highly suspicious for metastatic disease and lung primary. Interval imaging showed worsening. Additional contralateral pulmonary nodules are seen consistent with likely M1a lesions at least. Awaiting PD-L1 staining and additional molecular testing, plan for Guardant360, discussed immunotherapy (possible combination with chemotherapy), will complete staging workup.

02/28/2021 – CTA – Numerous lung masses, dominant one noted in the left upper lobe region. No evidence of pulmonary embolism.

03/01/2021 – CT head – no evidence of mets.

03/02/2021 – PET SCAN Progression of multiple bilateral lung masses and nodules. New nodular and interstitial LUL infiltrate is likely related to lymphangitic spread of tumor. Bilateral pleural effusions with compressive lower lobe atelectasis.

Patient is s/p Guardant360 testing (negative).

precision medicine noting limited mutations amenable to on label targeted therapy, otherwise PD-L1 CPS 30%. Given his overall performance status along with clinical findings will proceed with IO monotherapy, Keytruda. Re-reviewed data from Keynote-42 [Mok, et al Lancet 2019] including median OS 17.7m, ORR 33% in TPS >20% group. Re-addressed adverse effects of immunotherapy treatment,

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including autoimmune phenomenon, fatigue, rash, thyroiditis, hypophysitis, pneumonitis, hepatitis, colitis, etc. Of note patient does not have any documented auto-immune conditions.

Of note, per NCCN guidelines Keytruda can cross cover for recurrent or metastatic SCC. Patient recently completed re-staging CT imaging in June 2021. We re-addressed goals of care including disease control and symptom management.

06/11/2021 CT TAP – Favorable treatment response, resolved or smaller bilateral pulmonary nodules and smaller thoracic lymphadenopathy, persistent small to moderate loculated pleural effusions. No new sites of disease

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JEOPARDY

The answer is next to each number. Select the scenario that best reflects the answer.

1. Pathologic grade 2
 - Patient with biopsy showing a moderately differentiated adenocarcinoma, resection showed poorly differentiated adenocarcinoma.
 - Patient with biopsy showing a moderately differentiated adenocarcinoma, resection showed no residual tumor.
 - Patient with biopsy showing a poorly differentiated adenocarcinoma, resection showed moderately differentiated adenocarcinoma
 - Patient with biopsy showing a moderately differentiated adenocarcinoma, patient proceeded with XRT

2. Pathologic Grade 3
 - Patient with lung biopsy revealing a poorly differentiated squamous cell carcinoma, patient with liver and bone metastasis seen on scans.
 - Patient with lung biopsy revealing a poorly differentiated squamous cell carcinoma, patient with suspected hilar node metastasis seen on scans, proceeded to treatment with Keytruda.
 - Patient with lung biopsy revealing a poorly differentiated squamous cell carcinoma, patient had resection of the primary tumor with anaplastic squamous cell carcinoma identified.
 - Patient with lung biopsy revealing a poorly differentiated squamous cell carcinoma, patient with liver and bone metastasis seen on scans, liver biopsy showed moderately differentiated squamous cell carcinoma.

3. Lung – separate tumor nodules Code 1 (Separate tumor nodules of same histologic type in ipsilateral lung, same lobe)
 - Patient presents for screening lung CT – 2 nodules are identified in the RUL, resection revealed synchronous primary tumors (lepidic adenocarcinoma and acinar adenocarcinoma)
 - Patient presents for screening lung CT – 1 nodule identified in the RUL and one in the RLL, biopsies revealed synchronous primary tumors (lepidic adenocarcinoma and acinar adenocarcinoma)
 - Patient presents for screening lung CT – 2 nodules are identified in the RUL, biopsy of the larger tumor revealed adenocarcinoma
 - Patient presents for screening lung CT – 1 nodule identified in the RUL and one in the RLL, biopsy of the RUL tumor revealed adenocarcinoma

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4. Visceral/Parietal Pleural Invasion coded as 0 (No evidence of visceral pleural invasion identified; Tumor does not completely traverse the elastic layer of the pleura)
 - Patient with new lung nodule noted in the peripheral LLL, patient with wedge resection – pathology report shows a 2.2 cm mucinous adenocarcinoma. At the postop visit, the MD states the tumor extended to the elastic layer.
 - Patient with new lung nodule noted in the peripheral LLL, scans were suspicious for parietal pleural invasion.
 - Patient with new lung nodule noted in the peripheral LLL, patient with FNA – pathology report shows a mucinous adenocarcinoma that appeared to invade the visceral pleura.
 - Patient with new lung nodule noted in the peripheral LLL, patient with wedge resection – pathology report shows a 2.2 cm mucinous adenocarcinoma that invaded the visceral pleura only.

5. Tumor Size Summary 008
 - Patient with new lung nodules seen on CT chest in the RUL, 3 nodules measured as 8 cm, 4 cm and 2 cm, patient placed on Keytruda
 - Patient with new lung nodules seen on CT chest in the RUL, 2 nodules 8 mm and 6 mm, wedge resection performed with both nodules removed, pathology states 7 mm and 5 mm.
 - Patient with new lung nodules seen on CT chest in the RUL, one nodule was between 7 and 9 mm; the other was between 6 and 8 mm, patient given radiation.
 - Patient with new lung nodules seen on CT chest in the RUL, patient taken to surgery and had a right upper lobectomy, tumor size 8 cm and 1.4 cm.

6. Clinical Staging cTX cN0 cM0 Stage group unknown
 - Patient presents with ongoing cough and congestion. Chest CT showed infiltrates but no discrete tumor, bronchoscopy did not identify any sites of concern, bronchial washings revealed malignant cells.
 - Patient presents with ongoing cough and congestion. Chest CT showed infiltrates and a 1 cm RUL nodule, bronchoscopy did not identify any sites of concern, bronchial washings revealed malignant cells.
 - Patient presents with ongoing cough and congestion. Chest CT showed infiltrates but no discrete tumor, bronchoscopy with FNA of a level 10R node. Node was positive for adenocarcinoma.
 - Patient presents with ongoing cough and congestion. Chest CT showed infiltrates and a RUL nodule-1 cm, bronchoscopy with biopsy of the nodule was positive for adenocarcinoma.

7. Pathological Staging pT1b(m) pN0(f) cM0 Stage group IA2
 - Patient with 2 RLL tumors, FNA of a level 10R node was negative, wedge resection performed along with dissection of 6 regional nodes and identified synchronous primary tumors.
 - Patient with 2 RLL tumors, FNA of a level 10R node was negative, wedge resection performed and identified one primary tumor and one intrapulmonary mets.
 - Patient with 2 RLL tumors, FNA of a level 10R node was neg. Wedge resection and removal of 6 regional nodes; 1 RLL primary tumor, 1 intrapulmonary met, and 6 negative nodes.
 - Patient with 2 RLL tumors, FNA of a level 10R node was negative, wedge resection performed and identified synchronous primary tumors.

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8. Primary site: C34.1 (Lung, upper lobe)
 - Patient with a chest CT scan that identified a Pancoast Tumor
 - Patient with a chest CT scan that identified a mass at the carina.
 - Patient with a chest CT scan that identified a mass extending up to the hilum
 - Patient with a chest CT scan that identified a suprahilar mass

9. Histology: 8257/3 (minimally invasive mucinous adenocarcinoma)
 - Patient with a single tumor in the RUL: Biopsy report identifies a probable minimally invasive mucinous carcinoma, resection confirms mucinous carcinoma
 - Patient with a single tumor in the RUL: Pathology report identifies a mucinous carcinoma and minimally invasive mucinous carcinoma.
 - 3. Patient with a single tumor in the RUL: Pathology report identifies a mucinous adenocarcinoma with a minimally invasive pattern
 - Patient with a single tumor in the RUL: Pathology report identifies a minimally invasive adenocarcinoma and a mucinous adenocarcinoma.

10. Summary Stage 2018 3 (Regional lymph node(s) involved only)
 - Patient presents with cough, Chest CT revealed a RUL mass and atelectasis extending to the hilar region.
 - Patient presents with cough, Chest CT revealed a RUL mass with invasion of the parietal pleura
 - Patient presents with cough, Chest CT revealed a RUL mass and superior vena cava syndrome.
 - Patient presents with cough, Chest CT revealed no evidence of tumor in the lungs, but malignant cells in the bronchial washings.