## **Case Scenario 1: Breast**

A 63 year old white female presents with a large mass in her left breast.

4/15/13 Mammogram/US:

1. Left breast mammographic and sonographic at 3:00 measuring 7.1 cm highly suggestive of malignancy.
2. Questionable adjacent 3:00 satellite nodule versus cyst was noted.
3. Left breast 2 adjacent 4:00 probable complicated cysts. A cyst aspiration was recommended to exclude satellite nodules.
4. Abnormal left axillary lymph nodes.

4/19/13 Final Diagnosis Breast Biopsy:

* Left breast bx: Invasive ductal ca, grade 3
* Left axillary lymph node biopsy: neg for malignancy
* Estrogen Receptor: POSITIVE.
* Progesterone Receptor: NEGATIVE.
* HER2 IHC Result: EQUIVOCAL (SCORE = 2 +).
* HER2 Gene Amplification by FISH: POSITIVE (AMPLIFIED).

4/25/13-Neoadjuvant Adriamycin, cyclophosphamide, taxol followed by Herceptin

8/20/13 Left breast wire-directed partial mastectomy, SLN biopsy

FINAL DIAGNOSIS

A) LYMPH NODE, LEFT AXILLA - COLD, EXCISIONAL BIOPSY:

- NO TUMOR SEEN IN 1 OF 1 LYMPH NODE.

B) LYMPH NODE, LEFT AXILLA - SENTINEL NODE, BIOPSY:

- NO TUMOR SEEN IN 1 OF 1 LYMPH NODE BY HISTOLOGY OR ANTIKERATIN AE1/AE3

IMMUNOHISTOCHEMISTRY.

C) LEFT BREAST, PARTIAL MASTECTOMY:

HISTOLOGIC TUMOR TYPE: INVASIVE DUCTAL CARCINOMA.

SIZE OF INVASIVE TUMOR: 1.2 x 1.1 x 1.0 CM.

COMPOSITE HISTOLOGIC GRADE: III (POORLY DIFFERENTIATED).

Tubule formation score: 3

Nuclear pleomorphism score: 3

Mitotic count score: 2

Total Nottingham score: 8

DUCTAL CARCINOMA IN-SITU: HIGH-GRADE DCIS ASSOCIATED WITH TUMOR MASS.

LYMPH-VASCULAR INVASION: NONE IDENTIFIED.

MARGINS: ALL MARGINS FREE FROM INVASIVE CARCINOMA AND DCIS; CLOSEST MARGIN IS THE

INFEROPOSTERIOR MARGIN WHICH IS 0.4 CM. FROM TUMOR.

D) LEFT BREAST 6:00 MARGIN, EXCISION:

- NEGATIVE FOR MALIGNANCY.

Diagnostic Comments:

The partial mastectomy specimen shows invasive ductal carcinoma; there is ductal carcinoma in-situ associated with the main tumor mass. The invasive carcinoma and DCIS are free from specimen margins, the closest margin being the inferoposterior margin which is 0.4 cm. from the tumor. In the separately submitted "new 6:00 margin" specimen, there are two stray fragments of cauterized tissue in one of the tissue blocks (one of which contains DCIS); however, these two stray fragments do not appear to be part of the new margin specimen. All margins of the partial mastectomy specimen and the "new 6:00 margin" specimen appear free from malignancy.

9/7/13 Medical Oncology: Completion of neoadjuvant regimen: Adriamycin, cyclophosphamide, taxol followed by Herceptin

10/19/13-1/12/14 Radiation Oncology: The left breast received 50.4 Gy in 28 sessions utilizing 6 and 18 MV photons, tangential portals, and a field-in-field technique. The tumor bed was boosted an additional 10 Gy in 5 treatments for a total of 60.4 Gy in 33 treatments. The tumor bed was treated utilizing 20 MeV electrons and an enface treatment portal.

1/9/14 Medical Oncology: Anastrozole

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## **Case Scenario 2: Lung**

A 54 year white male presents with a recent abnormal CT of the chest. The patient has a history of melanoma, kidney, and prostate cancers.

10/24/13 Chest X-ray: 2.9 cm mass like density in the inferior lingular segment worrisome for neoplasm. Malignancy cannot be excluded.

10/26/13 CT Chest: 2.8 cm speculated soft tissue mass inferior lingular segment consistent with malignancy. This could represent either a primary such as bronchogenic carcinoma or a metastasis. Indeterminate non-calcified sub centimeter soft tissue nodules of unknown malignant potential (one within left upper lobe and one within the right upper lobe).

11/12/13 PET/CT: A 2.9 cm diameter spiculated mass in the lingula demonstrates abnormally increased FDG accumulation (max SUV = 11.9). This is consistent with malignancy. No additional sites of abnormally increased FDG accumulation are visualized elsewhere. Specifically, no abnormal FDG accumulation to correspond to the sub centimeter nodules visualized on the outside CT study in the upper lobes bilaterally. Although the absence of visible FDG accumulation favors a benign etiology, the small size of the nodules reduces the sensitivity of FDG-PET imaging for detecting malignancy.

12/5/13 Operative Report: Left thoracoscopic wedge resection and left upper lobectomy: With the patient under adequate general tracheal anesthesia, bronchoscopy was performed. No endobronchial lesions identified. With the double-lumen endotracheal tube positioned, in the full lateral position with the left side up, patient prepped and draped. Three access ports were utilized, through which a 10 mm rigid thoracoscope was introduced. There were no significant adhesions. The lesion was identified in the lingular area in the upper lobe. A generous wedge resection was performed using the endoscopic stapler. The specimen was removed in a sterile bag and sent for frozen section evaluation, which proved to be an adenocarcinoma. It did not appear to be metastatic. Therefore, the upper lobe was resected in standard fashion. The heavy black load was used to cross the bronchus, purple loads across the other vascular structures. The specimen was removed. The bronchial stump was checked and was air tight. The area was irrigated out. Mediastinal nodes were sampled.

Path: Final Diagnosis:

A) LUNG, LEFT UPPER LOBE, WEDGE BIOPSY:

-HISTOLOGIC TUMOR TYPE: INVASIVE MODERATE DIFFERENTIATED ADENOCARCINOMA.

-HISTOLOGIC TUMOR GRADE: GRADE 2 (OF 4).

-TUMOR FOCALITY: UNIFOCAL.

-TUMOR SIZE: 2.9 X 2.5 X 2.3 CM.

-VISCERAL PLEURA INVOLVEMENT: PRESENT (PL1 HIGHLIGHTED WITH VVG STAIN).

-VASCULAR INVASION: NOT IDENTIFIED.

-MARGINS: SURGICAL MARGIN IS NEGATIVE FOR TUMOR.

-ADDITIONAL PATHOLOGIC FINDINGS: EMPHYSEMATOUS CHANGES AND BRONCHIECTASIS.

B) LYMPH NODE (1), MEDIASTINAL, EXCISION:

- NEGATIVE FOR MALIGNANCY.

C) LUNG, LEFT UPPER LOBE, LOBECTOMY:

- NO RESIDUAL TUMOR IDENTIFIED.

- THE SURGICAL MARGINS ARE NEGATIVE.

- A SINGLE BENIGN LYMPH NODE IS IDENTIFIED.

D) LYMPH NODE (1), AP WINDOW, EXCISION:

- NEGATIVE FOR MALIGNANCY.

E) LYMPH NODE (1), INFERIOR PULMONARY LIGAMENT, EXCISION:

- HYALINIZED GRANULOMATOUS INFLAMMATION.

- NEGATIVE FOR MALIGNANCY.

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## **Case Scenario 3: Prostate**

2/4/13 HISTORY: 68-year-old white male with elevated PSA, 3.99, on routine screening in January.

DRE: On digital rectal exam the sphincter tone is normal and there is a 1 cm nodule involving less than half of the left lateral lobe of the prostate gland. The prostate is otherwise smooth and firm.

3/8/13 TRUS: The prostate gland had a normal sonographic appearance throughout. The height, width and length method were used to estimate the volume, which was 26.7 cm3. Using ultrasound guidance lidocaine 1%, 5 mL was injected posterolaterally near each seminal vesical. After a few minutes, systematic biopsies were performed. Using ultrasound guidance, two needle core biopsies were obtained from the lateral edge, and three were obtained medially on each side of the gland. One of the medial biopsies on each side traversed the apex of the prostate.

3/8/13 PROSTATE BIOPSY:

* Prostate, left, needle biopsy: Adenocarcinoma, Gleason score 3+4=7, involving 5 of 5 cores and 90% of specimen. Perineural invasion is present. No lymphovascular invasion identified. No extraprostatic extension identified. No seminal vesicle tissue present for evaluation.
* Prostate, right, needle biopsy: Adenocarcinoma, Gleason score 3+4=7, involving 4 of 5 cores and 30% of specimen. No perineural or lymphovascular invasion identified. No extraprostatic extension identified. No seminal vesicle tissue present for evaluation.

4/19/13 BONE SCAN: No scintigraphic findings to suggest skeletal metastases.

4/20/13 CT A/P: There are multiple cystic like lesion within the liver with one indeterminate lesion in the inferior aspect of the left lobe of the liver. If there is a high clinical suspicion for metastatic disease, recommend further evaluation with MRI of the abdomen.

5/27/13 PROSTATE GLAND, ROBOTIC-ASSISTED LAPAROSCOPIC PROSTATECTOMY AND

BILATERAL PELVIC LYMPHADENECTOMY:

1. Prostate

* Histologic tumor type: Adenocarcinoma
* Histologic tumor grade: Gleason score 3+4=7
* Tumor quantitation: Tumor involves right and left lobes with predominant involvement of the left lobe. Tumor involves approximately 60% of the left lobe and approximately 30% of the right lobe.
* Extraprostatic tumor extension: Not identified.
* Perineural invasion: Extensive perineural invasion is present.
* Lymph vascular invasion: Not identified.
* Margins: Apical, bladder neck and peripheral soft tissue inked margins are free of tumor.
* Seminal vesicle muscle wall invasion: No evidence of malignancy right and left seminal vesicles.
* Right pelvic lymph nodes (part C): No evidence of malignancy, 6 lymph nodes.
* Left pelvic lymph nodes (part D): No evidence of malignancy, 10 lymph nodes.

1. Left posterior lateral margin: No evidence of malignancy.
2. Lymph nodes, right pelvic lymph node dissection: No evidence of malignancy, 6 lymph nodes.
3. Lymph nodes, left pelvic lymph node dissection: No evidence of malignancy, 10 lymph nodes.

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