Criteria	Yes	No
Diagnosis Discrepancy.		✓
Primary Tumor Site Discrepancy		✓
HIPAA Discrepancy		✓
Prior Malignancy History		✓
Dual/Synchronous Primary (Note)		

Case is (circle): QUALIFIED / DISQUALIFIED

Reviewer Initials: RB Date Reviewed: 9/24

lw 10/21/11

UUID:BEC7EEA9-6DEA-4402-A3A1-07EF33D58174

TCGA-A1-A0SB-01A-PR Redacted

ICD-O-3

carcinoma, adenoid cystic 8200/3

Site: breast, NOS C50.9 lw 10/21/11

Final Pathologic Diagnosis:

A. Sentinel lymph node #1, biopsy: No carcinoma in one lymph node (0/1); see comment.

B. Sentinel lymph node #2, biopsy: No carcinoma in one lymph node (0/1); see comment.

C. Breast, left, wire-guided partial mastectomy:
1. Adenoid cystic carcinoma, SBR Grade 1, 1.2 cm; see comment.
2. Microcalcifications involving benign ducts.
3. Atypical ductal hyperplasia.
4. Apocrine metaplasia.
5. Biopsy site changes.
6. Fibroadenoma.

D. Breast, right, mammoplasty:
1. Intraductal papilloma.
2. Sclerosing adenosis.
3. Apocrine metaplasia.
4. Microcalcifications involving benign glands.
5. Microcysts.

6. Skin with no significant pathologic abnormality.
7. No carcinoma identified.

E. Breast, left, mammoplasty:
1. Usual ductal hyperplasia.
2. Apocrine metaplasia.
3. Fibroadenoma.
4. Skin with no significant pathologic abnormality.
5. No carcinoma identified.

Note: This is an unusual tumor. H&E sections show a relatively circumscribed tumor with large nests of epithelial cells in a cribriform growth pattern. The stroma is sclerotic. The differential diagnosis includes adenoid cystic carcinoma or a cribriform variant of invasive ductal carcinoma. A prior core needle biopsy of the left breast at 6 o'clock ( ) was reviewed.

Immunohistochemical studies were necessary to evaluate this case and establish the correct diagnosis. The following immunohistochemical stains were performed and evaluated:

ER: Positive, 2+ staining in 75% of cells.
PR: Negative, no staining in any tumor cells. (internal positive control present)
CD117: Positive.
SMA: Focally positive, relatively high background.
SMM: No myoepithelial cells present around most nests of tumor cells.
p63: Positive in basaloid cells in most areas.

The above immunohistochemical stains support a diagnosis if adenoid cystic carcinoma. Although ER expression is often negative in adenoid cystic carcinoma, the presence of basal cell immunophenotype (positive p63) and the positive CD117 support this diagnosis. Insofar as adenoid cystic carcinoma represents a dual population of basaloid and epithelial cells, it may be that this example is somewhat rich in the epithelial component thus explaining the ER positivity. The above interpretation may also explain the rather diffuse CD117 staining. The absence of a define myoepithelial layer by the SMM further supports the diagnosis. We recognize that this tumor was also sent for gene expression profiling so correlation with those findings for a basaloid expression profile is also suggested.

Drs. [redacted] and [redacted] have reviewed selected slides form this case and concur with the diagnosis of adenoid cystic carcinoma.

Breast Tumor Synoptic Comment

- Laterality: Left.
- Invasive tumor type: Adenoid cystic carcinoma.
- Invasive tumor size: 1.2 cm.
- Invasive tumor grade (modified Bloom-Richardson):
  - Nuclear grade: 2.
  - Mitotic count: 1 mitotic figures/10 HPF.
  - Tubule/papilla formation: 1.
  - Total points and overall grade = 4 points = grade 1.
- Lymphatic-vascular invasion: None.
- Skin/nipple: No specific pathologic abnormalities.
- Margins for invasive tumor: Negative.
  - Anterior (skin): N/A.
  - Posterior: Negative (tumor is > 1 cm away).
  - Inferior lateral margin (black ink): Negative; (tumor is >1 cm away, on slide C4).
  - Inferior medial margin (green ink): Negative; (tumor is > 1 cm away, on slide C5).
  - Superior margin (blue ink): Negative; (tumor is >1 cm away, on slide C3).
- Microcalcifications: Present, involving benign ducts.

- Lobular carcinoma in situ: None.

- Lymph node status: Negative.
  - Total number sampled: 2.
- AJCC/UICC stage: pT1cN0MX.

Result of HER2/neu test: This carcinoma is negative for HER2/neu oncoprotein over-expression.
An immunohistochemical assay was performed by manual morphometry on block C3 using the CB11 monoclonal antibody to HER2/neu oncoprotein. The staining intensity of this carcinoma was 0 on a scale of 0-3.

Carcinomas with staining intensity scores of *0 or 1* are considered *negative* for over-expression of HER2/neu oncoprotein.

Those with a staining intensity score of *2* are considered *indeterminate*. We and others have observed that many carcinomas with staining intensity scores of 2 do not show gene amplification. All carcinomas with staining intensity scores of 2 are therefore submitted for FISH testing. The results of the FISH test are issued directly from the molecular cytogenetics laboratory.

Carcinomas with staining intensity scores of *3* are considered *positive* for over-expression of HER2/neu oncoprotein. Tumors in this category show an excellent correlation between the results of immunohistochemical and FISH testing, and almost always show gene amplification.

In addition to the above findings, several lymph nodes are enlarged with a fairly monotonous population of small lymphocytes, concerning for lymphoma. Immunohistochemical stains were performed to characterize the small lymphocyte population as follows:
- CD20: Highlights widely scattered aggregates of small lymphoid cells, consistent with primary follicles.
- CD3: Highlights small lymphocytes predominantly in interfollicular areas.
- CD21: Highlights aggregates of dendritic cells underlying B cell aggregates, confirming their identity as B cell follicles.
- CD23: Highlights aggregates of dendritic cells underlying B cell aggregates, confirming their identity as B cell follicles.

Together, these findings are consistent with a diagnosis of benign quiescent nodes, and argue against a diagnosis of lymphoma.

Dr. [redacted] of Hematopathology has reviewed parts A and B and agrees with the above interpretation.

A preliminary diagnosis was given to in Dr. [redacted] clinic on Additional preliminary diagnosis given to in Dr. [redacted] clinic on

Intraoperative Consult Diagnosis

FS1 (A1) Sentinel lymph node #1 (half of the specimen), biopsy: Rare scattered atypical cells. Cannot completely rule out carcinoma. Defer to permanent. Dr. [redacted] concurs. (Dr. [redacted],

FS2 (A2) Sentinel lymph node #1 (other half of the specimen), biopsy: Rare scattered atypical cells. Cannot completely rule out carcinoma. Defer to permanent. Dr. [redacted] concurs. (Dr. [redacted],

FS3 (B) Sentinel lymph node #2, biopsy: Rare scattered atypical cells. Cannot completely rule out carcinoma. Defer to permanent. Dr. [redacted] concurs. (Dr. [redacted],

Clinical History

The patient is a year-old female with adenoid cystic carcinoma of the left breast vs. ductal carcinoma. She has an additional lesion, seen on MRI, suspicious for carcinoma. The patient now undergoes left wire-guided partial mastectomy and sentinel lymph node dissection with bilateral mammoplasty for symmetry.

Gross Description

The specimen is received in five parts, each labeled with the patient's name and unit number. Parts A-C are received fresh. Parts D-E are received in formalin.

Part A, additionally labeled "1 - sentinel lymph node #1 count = 5900," consists of one soft, ovoid, red-yellow, irregular, unoriented fibroadipose tissue fragment that is 3.2 x 2 x 1 cm. It is oriented by a stitch placed by the surgeon marking the hottest spot. The stitch area is inked blue. Adipose tissue is removed. Lymph node candidate is bisected. 50% of the lymph node candidate is submitted for frozen section diagnosis 1, with the frozen section remnant submitted in cassette A1. The remaining 50% of the lymph node candidate is submitted for frozen section diagnosis 2, with the frozen section remnant submitted in cassette A2. The remaining adipose tissue is submitted in cassette A3.

Part B, additionally labeled "2 - sentinel lymph node #2 count = 12700," consists of one soft, red-yellow, irregular, unoriented, ovoid, oriented fibroadipose tissue fragment that is 2 x 1.7 x 0.8 cm. A stitch is placed by the surgeon marking the hottest spot; this area is inked blue. Adipose tissue is removed. The lymph node candidate is bisected and submitted for frozen section diagnosis 3, with the frozen section remnant submitted in cassette B1. The remaining adipose tissue is submitted in cassette B2.

Part C is labeled "left breast needle localization biopsy."
- **SPECIMEN TYPE**: Wire-guided partial mastectomy.
- **SKIN ELLIPSE:** Present.
- **NIPPLE:** Not present.
- **ORIENTATION:**
    - Double long suture: Lateral, on side with Telfa.
    - Short double suture: Superior.
    - Short single suture: Inferior, opposite of needle wire.
- **INKING (for microscopic evaluation):**
    - Black: Lateral (Telfa side).
    - Green: Medial (side opposite wire needle).
    - Blue: Superior (side with wire).
- **SIZE OF SPECIMEN:**
    - Medial-lateral dimension: 6 cm.
    - Superior-inferior dimension: 6 cm.
    - Anterior-posterior dimension: 11.2 cm.
- **TOTAL NUMBER OF SLICES:** 19.
    - First slice (slice 1): Anterior margin (skin).
    - Last slice (slice 19): Posterior margin.
- **GROSS PATHOLOGY:** On serial sectioning, multiple nodules are identified throughout the breast parenchyma. A dominant, rubbery/hard, tan-pink mass is identified in slices 3-4 and measures 1 x 1 x 0.8 cm. This mass is located centrally within the slices and is located 1.1 cm from the blue ink, 1 cm from the green ink, and 1.5 cm from the black ink. Two tan-white rubbery nodules are seen in slice 5; one nodule measures 0.7 x 0.4 x 0.3 cm and is 0.7 cm from the blue ink. The other nodule measures 0.3 x 0.3 x 0.3 cm and is 0.2 cm from the blue ink. A tan-yellow rubbery nodule is identified in slice 7-8, measuring 0.4 x 0.3 x 0.3 cm. In addition, a white-tan rubbery nodular area is seen in slice 8, abutting the black ink and measuring 0.6 x 0.3 x 0.2 cm. A white-tan rubbery nodule is also seen in slice 9, abutting the blue ink, and measuring 0.3 x 0.2 x 0.2 cm. An additional hard, tan-pink nodule is seen in slice 9, measuring 0.3 x 0.3 x 0.3 cm. A tan-white rubbery nodule is seen in slices 15-16, measuring 0.5 x 0.5 x 0.5 cm. This nodule is suspicious for a lymph node. The needle tip is present in slice 15. Representative sections are submitted as follows:

Cassette C1:	Skin (slice 1).
Cassettes C2-C5:	Dominant mass in slices 3-4, entirely submitted.
Cassette C6:	Larger nodule, slice 5.
Cassette C7:	Smaller nodule, slice 5.
Cassette C8:	Nodule, slices 7-8.
Cassette C9:	Nodular area in slice 8, abutting black ink.
Cassette C10:	Both nodules in slice 9.
Cassette C11:	Nodule, slice 11.
Cassettes C12-C13:	Nodule, slices 15-16, entirely submitted.

Cassettes C14-C15: Posterior margin, perpendicularly sectioned.

Part D, labeled "right breast tissue and skin," consists of one fragment of fibrofatty tissue with attached skin and multiple other fragments of skin and fibrofatty tissue measuring, in aggregate, 13 x 10 x 3.5 cm and weighing 170 gm in total. The fragments of skin are grossly unremarkable, with no suspicious lesions or areas. A single tan-yellow nodule measuring 0.1 x 0.1 x 0.1 cm is noted in one of the fibrofatty tissue fragments, which also contains an area that is mostly fibrous. The largest fibrofatty tissue fragment with attached skin, measuring 11.5 x 9.2 x 3.5 cm and the skin ellipse measuring 8 x 7 cm, contains a single white-tan, rubbery, nodular area measuring 0.3 x 0.2 x 0.2 cm. The rest of the specimen is grossly unremarkable, with no other suspicious lesions seen. Representative sections are submitted as follows:

Cassette D1: 0.1 x 0.1 x 0.1 cm nodule from fibrofatty tissue fragment.
Cassette D2: Fibrous area from fibrofatty tissue fragment.
Cassette D3: Nodular area from largest specimen.
Cassette D4: Representative section skin and fibrofatty tissue from largest specimen.

Part E, labeled "left breast tissue and skin," consists of multiple fragments of fibrofatty tissue, as well as multiple fragments of skin, in aggregate measuring 6.5 x 6.5 x 2.2 cm and weighing 154 gm in total. The skin fragments are grossly unremarkable, with no suspicious areas or lesions seen. One fibrofatty tissue fragment contains a tan-white, lobulated, rubbery, nodular area measuring 1.2 x 1.1 x 1 cm. The rest of the fibrofatty tissue fragments are grossly unremarkable, with no suspicious lesions or areas seen. Representative sections are submitted as follows:

Cassette E1: Representative section of skin.
Cassettes E2-E3: Nodule in fibrofatty tissue fragment, entirely submitted.
Cassette E4: Representative section of fibrofatty tissue.

[redacted]/Pathology Resident

[redacted]/Pathologist
Signed:

Fee Codes:

Other Specimens

Specimen Class: Status: Signed Out Accessioned:
Signed Out:

Specimen(s) Received: Consult, Surgical w/ blocks or tissue

Final Diagnosis

Review of from [redacted]

Left breast, 6 o'clock, core needle biopsy: Malignant neoplasm with cribriform growth pattern; see comment.

[redacted] MD
[redacted] MD

Specimen Class: Status: Signed Out Accessioned:
Signed Out:

Specimen(s) Received: Left Breast, Fine Needle Aspiration

Final Diagnosis

Left Breast, Fine Needle Aspiration: **Fibroadipose tissue,** see comment.

[redacted]

__ __Specimen Class: Status: Signed Out Accessioned:
Signed Out:

Specimen(s) Received: Left breast, needle core biopsy 5:00, 5cm from nipple

Final Diagnosis

Left breast, 5:00, 5 cm from nipple, needle core biopsy:
1. Fibroadenoma with microcalcifications see comment.
2. Fat necrosis.

[redacted]

END OF REPORT