Answers: Chapter 16

Matching
1. f  5. j  9. l  13. a
2. c  6. n  10. d  14. i
3. h  7. b  11. m
4. k  8. g  12. e

Image Labeling
1A. Pectoralis major muscle
1B. Skin
1C. Subcutaneous fat layer
1D. Deep fascial layer
1E. Superficial fascial layer
1F. Lactiferous duct
1G. Lactiferous sinus
1H. Nipple
1I. Areola
1J. Parenchymal layer
1K. Cooper’s ligaments
1L. Retromammary layer
1M. Rib
1N. Pectoralis minor muscle
2A. TDLU
2B. Extralobular terminal duct
2C. Lactiferous duct
2D. Terminal ductules
2E. Intralobular terminal duct
2F. Intralobular stroma
2G. Lobule
3A. Skin
3B. Premammary zone
3C. Mammary zone
3D. Retromammary zone
3E. Pectoralis major muscle
4A. SAG
4B. TRV
4C. RAD
4D. ARAD
5A. 12:00
5B. RUIQ
5C. 3:00
5D. RLIQ
5E. 6:00
5F. RLOQ
5G. 9:00
5H. RUOQ
5I. 12:00
5J. LUOQ
5K. 3:00
5L. LLOQ
5M. 6:00
5N. LLIQ
5Q. 9:00
5P. LUIQ

Multiple Choice
2. d  7. b  12. b  17. b  22. c
3. b  8. b  13. c  18. c  23. d
5. c  10. d  15. a  20. d  25. b

Fill-in-the-Blank
1. Mammography
2. Microcalcifications; fatty; dense
3. Cystic; solid; young; pregnant; lactating
4. Subcutaneous fat; mammary or parenchymal; retromammary fat
5. 15 to 20; radial; 20 to 40
6. Pectoralis; pectoralis minor
7. 2 mm; areola; inframammary fold
8. Retromammary fat
9. Radial; antiradial
10. Location; scan plane; nipple
11. Craniocaudal; medial; lateral; medial lateral oblique; axilla; inframammary; pectoralis
12. Fibrocystic change; tenderness or pain; nodularity; cysts
13. Mastitis; pregnant; lactating; abscess
14. Fat necrosis; increased; oil cyst
15. Lactating adenoma
16. Lactiferous duct; obstruction
17. Eight; 50; TDLU; upper outer
18. In situ; lobular carcinoma in situ; ductal carcinoma in situ
19. Basement membrane; IDC NOS or invasive ductal carcinoma not otherwise specified
20. Hard; fixed; painless; reactive fibrosis
21. Multifocal; multicentric; desmoplasia
22. Bloody nipple discharge
23. Inflammatory; red; warm; edematous
24. Ipsilateral axillary; sentinel; bone; liver; lung; brain
25. Fremitus; void

Short Answer
1. Mammography is the only widely used screening tool proven effective at reducing breast cancer mortality. Mammography is effective at detecting suspicious microcalcifications, which may be the first imaging sign of early malignancy. Mammography is not as effective in dense breasts as it is in fattier breasts. It cannot detect all breast lesions and may sometimes diagnose a pseudomass. Mammography cannot determine if a lesion is cystic or solid, and if a mass can only be visualized in one view, it can be difficult to determine the exact location of the mass.
2. Breast sonography is used to evaluate younger patients with palpable mass; patients who are pregnant or lactating; or patients with trauma, recent breast surgery, and inflammatory or postirradiation changes. Sonography is also used to evaluate the male breast. Sonography is often used to follow up a lesion seen on mammography to further characterize the lesion or determine if the lesion is cystic or solid. Sonography is also used to guide biopsy or other interventional procedures.

Sonography does not use ionizing radiation and it is widely available at a lower cost than MRI. It is painless and provides a real-time evaluation of the breast. Sonography can distinguish cystic versus solid lesions and can aid in detection of lesions in radiographically dense breasts. Sonography can help localize a mass that is only visualized in one mammographic view.

3. Patient positioning depends on the location of the lesion and breast size. The patient is typically evaluated in the supine or supine-oblique position. With the supine oblique position, the patient is rolled onto his or her side at 30 degrees to 45 degrees. The adjacent arm is extended over the head. This position is especially helpful when evaluating lesions in the outer breast. Reducing the thickness of the breast in the area of the lesion is important. If the patient can only feel the mass in a certain position, such as sitting upright, then the patient can be scanned in that position.

The images are labeled with the side that is being imaged, the location of the image, typically a clock position, and the scan plan of the image. For example: RT Breast 1:00 Radial. The location of the mass from the nipple may also be included.

4. Suspicious characteristics include a mass that is taller than wide, has irregular or indistinct margins, or is angular in shape. Suspicious masses may have spiculations or cause architectural distortion. Skin thickening, nipple retraction, shadowing, and microcalcifications are also suspicious for malignancy.

5. Sonographically, capsular contracture will appear as a thickened capsule-shell complex and poor compressibility of the implant with transducer pressure. Post-surgery, an abscess, seroma, or hematoma may form and may be seen as a fluid collection. Intracapsular rupture is seen sonographically as stepladder or parallel-line sign within the silicone gel contained by the fibrous capsule. Extracapsular rupture will demonstrate an echogenic noise sign, which describes a discrete region of intense hyperechogenicity with dirty distal shadowing coming from tissue containing free silicone.

### IMAGE EVALUATION/PATHOLOGY

1. Oval shape; smooth, circumscribed margin; thin echogenic wall; anechoic; increased through transmission; bilateral edge shadowing

2. This cystic structure is well-defined with internal echoes and debris along the posterior wall. Bilateral edge shadowing is noted. The arrow is pointing to a fat-fluid level that is nondependent. The galactocele is located in the right upper outer quadrant of the breast.

3. A hyperechoic area with irregular margins and acoustic shadowing is seen, as well as architectural distortion, all of which are suspicious for malignancy. However, when the transducer is turned in the second image, the appearance of the linear dimensions change, which is a characteristic of a surgical scar and not a malignancy. Applying pressure with the transducer will reduce or eliminate the shadowing behind a scar, whereas malignant shadowing will persist. Color Doppler can be used to evaluate for flow in the area as well.

4. The large, hyperechoic, solid mass is well-circumscribed with smooth borders and is wider than tall. The likely diagnosis is a fibroadenoma.

5. This superficial mass is located directly under the skin line and is hyperechoic when compared to the surrounding tissue. It is wider than tall and has well-defined borders. It would be located in the left upper inner quadrant.

### CASE STUDY

1. This image represents a 3D image of the breast in the multiplanar view. The sagittal, transverse, and coronal planes are imaged here simultaneously. The mass is hypoechogenic with irregular, angular margins and acoustic shadowing. The mass is taller than wide and has spiculations. There is visible architectural distortion. The mass is located in the upper outer quadrant.

2. The arrow is pointing to an echogenic area that is characteristic of free silicone found within the breast tissue at the edge of the implant. This is called the echogenic noise sign or the snowstorm sign. This represents an extracapsular rupture of the implant.