MULTIPLE CHOICE

BREAST - MIXED EXAM - ANSWER KEY

PROPOSED FOR REVIEW - questions are the author's verbatim Q&A; distractors are auto-selected from other answers in the same bank and must be checked by a subject-matter reviewer (a distractor could coincidentally be correct). Not authoritative assessment content.

1. Which sonographic finding is most characteristic of a normal Cooper ligament?

A. Thin echogenic linear band producing posterior acoustic shadowing when perpendicular to the beam
B. Hypoechoic round mass with internal vascularity
C. Anechoic tubular structure with through-transmission
D. Hyperechoic curvilinear band deep to the pectoralis muscle

2. The orientation of normal ducts and Cooper ligaments creates which expected sonographic pattern in a healthy breast?

A. Ducts radiate from the nipple and Cooper ligaments form thin echogenic septa traversing the fat
B. Ducts and Cooper ligaments both run parallel to the pectoralis muscle
C. Ducts run parallel to the chest wall and Cooper ligaments parallel to the skin
D. Ducts run circumferentially around the nipple and Cooper ligaments run radially

3. Which structure produces the small bumps on the areola known as Montgomery tubercles?

A. Sebaceous (areolar) glands
B. Lymphatic vessels
C. Smooth muscle bundles
D. Lactiferous ducts

4. The standard recommended management for a BI-RADS 4 lesion is which of the following?

A. Tissue diagnosis (biopsy)
B. Six-month follow-up ultrasound
C. Surgical excision without biopsy
D. Routine annual screening

5. Which feature distinguishes a complex cystic and solid mass from a complicated cyst?

A. Presence of a discrete solid component, thick wall, or thick septation
B. Posterior acoustic enhancement
C. Mobile internal echoes on real-time imaging
D. Anechoic appearance

6. On strain elastography, a malignant breast lesion most commonly demonstrates which feature relative to its B-mode size?

A. Appears larger on the elastogram than on B-mode
B. Appears identical in size on both
C. Appears smaller on the elastogram than on B-mode
D. Cannot be measured on the elastogram

7. Which transducer is most appropriate for routine breast ultrasound in an average-sized breast?

A. Phased-array sector, 2 to 4 MHz
B. High-frequency linear array, at least 10 MHz
C. Curved array, 3 to 5 MHz
D. Intracavitary transducer, 8 to 10 MHz

8. A patient who recently underwent breast surgery presents with a palpable lump at the surgical bed. Ultrasound shows an anechoic to hypoechoic collection with internal septations and no internal flow. The most likely diagnosis is:

A. Hematoma
B. Seroma

C. Recurrent tumor
D. Abscess

9. In which quadrant of the breast are normal intramammary lymph nodes most commonly identified?

A. Upper outer quadrant
B. Lower outer quadrant
C. Lower inner quadrant
D. Subareolar region

10. The most common distant metastatic site for breast cancer is which of the following?

A. Bone
B. Brain
C. Pancreas
D. Spleen

11. A patient with a history of recent breast trauma or surgery presents with a palpable lump. Ultrasound shows an irregular, hyperechoic mass with posterior shadowing in the superficial subcutaneous tissue. The most likely diagnosis is:

A. Invasive ductal carcinoma
B. Fat necrosis
C. Hamartoma
D. Lipoma

12. Several years after breast-conservation therapy with radiation, expected sonographic and physical findings include:

A. Skin thickening, increased parenchymal echogenicity, and architectural distortion at the lumpectomy site
B. Decreased skin thickness with loss of all parenchymal echogenicity
C. A new hypoechoic, taller-than-wide mass with spiculated margins
D. Diffuse anechoic dilation of the ductal system

13. The milk-ejection (let-down) reflex during nursing is mediated by:

A. Estrogen acting on Cooper ligaments
B. Progesterone acting on alveolar cells
C. Prolactin acting on ductal smooth muscle
D. Oxytocin acting on myoepithelial cells

14. Which feature on color or power Doppler imaging is most suspicious for malignancy in a solid breast mass?

A. Flow confined to surrounding normal parenchyma
B. Penetrating vessels and a feeder vessel within the lesion
C. A single peripheral vessel running along a smooth capsule
D. No detectable internal flow

15. How is the location of a breast lesion most commonly documented in the radiology report?

A. By quadrant only (UOQ, UIQ, LOQ, LIQ)
B. By measurement from the sternal notch
C. By the patient's subjective description of where she feels it
D. By clock-face position, distance from the nipple, and depth

16. Which sonographic finding is most characteristic of a simple breast cyst?

A. Hypoechoic mass with posterior acoustic shadowing and angular margins
B. Anechoic, well-circumscribed, thin imperceptible wall, with posterior acoustic enhancement
C. Hyperechoic mass with central calcifications and distal attenuation
D. Heterogeneous mass with thick irregular walls and internal septations

17. A 1.5 cm breast mass with both anechoic cystic spaces and a discrete solid mural nodule is best described by which BI-RADS lexicon term?

A. Simple cyst
B. Clustered microcysts
C. Complicated cyst
D. Complex cystic and solid mass

18. A breast mass demonstrates the following: marked hypoechogenicity, taller-than-wide orientation, spiculated margins, dense posterior shadowing, and internal microcalcifications. Which entity is most consistent with these findings?

A. Simple cyst
B. Lipoma
C. Invasive ductal carcinoma
D. Fibroadenoma

19. A breast lesion with internal echoes equal in brightness to surrounding fat is described as which echo pattern?

A. Hypoechoic
B. Anechoic
C. Hyperechoic
D. Isoechoic

20. A simple breast cyst is causing pain and the patient requests aspiration. Which finding on aspirated fluid generally does NOT require cytologic analysis?

A. Aspirate from a complex cystic and solid mass
B. Aspirate from a cyst that does not resolve
C. Bloody aspirate
D. Clear or greenish straw-colored fluid with complete cyst resolution

21. Which breast cancer accounts for approximately 85% of all breast malignancies?

A. Medullary carcinoma
B. Ductal carcinoma in situ
C. Invasive ductal carcinoma, not otherwise specified
D. Invasive lobular carcinoma

22. A solid breast mass that is taller than wide on ultrasound is most consistent with which BI-RADS orientation descriptor?

A. Parallel
B. Indeterminate
C. Horizontal
D. Not parallel

23. On sonography, Paget disease of the nipple most often appears as which of the following?

A. A simple anechoic retroareolar cyst with posterior enhancement
B. A hyperechoic well-circumscribed retroareolar lipoma
C. A normal-appearing nipple with no underlying mass
D. A retroareolar mass with irregular margins, heterogeneous internal echoes, and posterior shadowing

24. Which of the following associated features in the BI-RADS lexicon suggests malignancy?

A. Eggshell calcifications around a mass
B. Architectural distortion
C. Edge shadowing of a cyst
D. Posterior enhancement of a cyst

25. Which of the following is the BI-RADS lexicon term used to describe an indistinct, echogenic boundary around a hypoechoic mass that suggests infiltration into surrounding tissue?

A. Eggshell calcification
B. Echogenic halo
C. Posterior enhancement
D. Edge shadow

26. A common pitfall in evaluating a small simple cyst on ultrasound is:

A. Color flow within the lesion
B. Echogenic capsule mimicking a hamartoma
C. Posterior acoustic shadowing simulating a solid mass
D. Internal echoes from slice thickness artifact mimicking a complicated cyst

27. When scanning a patient with breast implants, which technique helps optimally evaluate the breast parenchyma anterior to the implant?

A. Increase the time-gain compensation deep to the implant

B. Scan only through the implant to evaluate parenchyma
C. Use the implant-displacement (Eklund) principle to push the implant posteriorly and image the parenchyma anteriorly
D. Use a low-frequency curved transducer to penetrate through the implant

28. Which hormone is primarily responsible for ductal proliferation in the breast during puberty?

A. Prolactin
B. Oxytocin
C. Progesterone
D. Estrogen

29. Which BI-RADS lexicon descriptor refers to the long axis of a mass relative to the skin line?

A. Orientation
B. Echo pattern
C. Shape
D. Margin

30. True or false: A taller-than-wide orientation of a solid breast mass is considered a benign sonographic feature.

A. True
B. False

31. Which is a classic sonographic pitfall when scanning a hyperechoic intramammary lymph node?

A. Confusing it with mammary duct ectasia
B. Mistaking it for a focal area of fibroglandular tissue
C. Mistaking it for a malignant mass with shadowing
D. Confusing it with a galactocele

32. Which margin descriptor in the BI-RADS lexicon is most strongly associated with malignancy?

A. Smooth
B. Spiculated
C. Circumscribed
D. Macrolobulated

33. In the BI-RADS US lexicon, an anechoic mass with imperceptible wall, posterior acoustic enhancement, and thin edge shadows is classified as which of the following?

A. Complicated cyst
B. Complex cystic and solid mass
C. Simple cyst
D. Solid mass

34. Inflammatory carcinoma of the breast produces its characteristic clinical appearance because tumor cells obstruct which structure?

A. Lactiferous ducts
B. Internal mammary artery
C. Dermal lymphatic channels
D. Cooper ligaments

35. A breast lesion shows homogeneous low-level internal echoes, no septations, no solid components, and posterior acoustic enhancement. This is most consistent with which finding?

A. Simple cyst
B. Complex cystic and solid mass
C. Complicated cyst
D. Fibroadenoma

36. Mucinous (colloid) carcinoma is most commonly seen in which patient population?

A. Women older than 75 years
B. Adolescent girls
C. Pregnant women in the third trimester
D. Women in their early 20s

37. Which sonographic appearance is most typical of a fibroadenoma?

A. Oval, circumscribed, hypoechoic, parallel orientation, with thin echogenic pseudocapsule

B. Anechoic, thin-walled, with posterior enhancement
C. Hyperechoic, ovoid, with central echogenic hilum
D. Irregular, hypoechoic, taller-than-wide, with spiculated margins

38. The most appropriate management for a small, well-defined breast abscess is typically:

A. Ultrasound-guided needle aspiration with antibiotics
B. Observation only
C. Core needle biopsy
D. Open surgical excision as first-line therapy

39. Mastitis on ultrasound is most often characterized by:

A. A discrete oval hypoechoic mass with parallel orientation
B. A circumscribed mass with internal fat-fluid level
C. Anechoic ducts without surrounding tissue changes
D. Skin thickening, increased echogenicity of subcutaneous fat, and hyperemia on color Doppler

40. Which structure represents the dilated portion of the lactiferous duct just beneath the nipple, where milk pools during lactation?

A. Acinus
B. Areolar gland of Montgomery
C. Terminal ductal lobular unit
D. Lactiferous sinus

41. A patient presents with a red, warm, swollen, hard breast and ipsilateral axillary adenopathy. Sonography shows diffuse skin thickening and increased echogenicity of the subcutaneous fat without a discrete mass. Which condition mimics this presentation and must be differentiated by biopsy?

A. Lipoma
B. Fibroadenoma
C. Mastitis
D. Simple cyst

42. Which feature of a breast lesion would shift its BI-RADS category from probably benign (BI-RADS 3) to suspicious (BI-RADS 4)?

A. Posterior acoustic enhancement
B. Mild lobulation of margins
C. Stability of size on six-month follow-up
D. Development of a nonparallel orientation or irregular margins on follow-up

43. A cluster of tiny anechoic foci, each less than 2 to 3 mm, with thin intervening septations and no discrete solid component is identified in the breast. This finding is best described as:

A. Ductal ectasia
B. Intraductal papilloma
C. Galactocele
D. Clustered microcysts

44. The Rotter nodes (interpectoral nodes) are located:

A. Within the axillary tail of Spence
B. Along the internal mammary chain
C. Between the pectoralis major and pectoralis minor muscles
D. Posterior to the pectoralis minor in the subclavicular region

45. Following an ultrasound-guided core biopsy, why is a clip or marker commonly deployed at the biopsy site?

A. To deliver brachytherapy to the lesion
B. To allow MRI screening of the contralateral breast
C. To prevent hematoma formation
D. To localize the biopsy site if surgery or further imaging is needed

46. A 60-year-old presents with a hard, fixed, firm breast mass with nipple retraction and skin flattening; biopsy demonstrates extensive fibrous proliferation around invasive ductal cells. Which subtype is most consistent with these findings?

A. Scirrhous carcinoma
B. Tubular carcinoma
C. Mucinous carcinoma

D. Medullary carcinoma

47. After ultrasound-guided core biopsy of a breast mass yields a benign result, the next standard step is:

A. Immediate surgical excision regardless of concordance
B. Radiologic-pathologic concordance review and imaging follow-up if concordant
C. Repeat biopsy of the same lesion every 3 months indefinitely
D. No further follow-up of any kind

48. A solid breast mass that measures greater in its anteroposterior dimension than in its transverse dimension is best described as having which feature suspicious for malignancy?

A. Posterior acoustic enhancement
B. Wider-than-tall orientation
C. Taller-than-wide orientation
D. Parallel orientation to the skin

49. Compared with invasive ductal carcinoma, invasive lobular carcinoma generally has which prognostic profile?

A. A better prognosis with rare nodal involvement
B. An identical prognosis with no difference in laterality patterns
C. A poorer prognosis with higher rates of bilateral and multifocal disease
D. An excellent prognosis approaching that of tubular carcinoma

50. Which orientation of a solid breast mass is considered a benign feature?

A. Perpendicular to the skin (taller-than-wide)
B. Oblique to the chest wall
C. Vertical along the duct axis
D. Parallel to the skin (wider-than-tall)