
TITLE OF SAM **The New 5th Edition of BI-RADS: Changes in Mammography, Ultrasound, MRI Sections with Asymmetry Case Review**

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ASSESSMENT QUESTIONS & REFERENCES

Lecture 1: The New 5th Edition of BI-RADS: Changes in Mammography, US, MRI Sections

QUESTION 1: What is the most appropriate BI-RADS assessment for the following case scenario: suspicious palpable lump with no mammographic or sonographic correlate?

- A. BI-RADS 0 B. BI-RADS 1 C. BI-RADS 2 D. BI-RADS 3 E. BI-RADS 4
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ANSWER: B. BI-RADS 1

For a given case, when there is apparent or potential discordance between the assessment and the associated management recommendation, the correct BI-RADS approach is to choose the assessment that reflects the imaging findings, provide a concordant management recommendation for that assessment, and then add a sentence explaining why the specific circumstances of the case suggest different management. In this case, there are neither mammographic nor sonographic findings, so the appropriate BI-RADS assessment is negative (category 1), which should be accompanied by the concordant management recommendation of routine screening mammography in 1 year. However, because of the associated history of a suspicious palpable lump, the additional recommendation for surgical consultation might be appropriate. The other choices are incorrect for the following reasons.

BI-RADS 0: There are no mammographic or sonographic abnormalities in this case, so it would be incorrect to render a non-normal BI-RADS assessment.

BI-RADS 2: This assessment is appropriate only when at least one specific benign finding is described in the breast imaging report. There are no such findings in this case.

BI-RADS 3: This assessment is inappropriate when neither mammography nor ultrasound examination depicts any findings.

BI-RADS 4: There are no mammographic or sonographic abnormalities in this case, so it would be incorrect to render a non-normal BI-RADS assessment.

REFERENCE FOR QUESTION 1

D'Orsi CJ, Sickles EA, Mendelson EB, Morris EA. Breast Imaging Reporting and Data System (BI-RADS). 5th ed. Reston, VA: American College of Radiology, 2013.

QUESTION 2: What is the most appropriate BI-RADS assessment for the following case scenario: focal asymmetry at baseline screening mammography, no additional abnormalities at diagnostic mammography, no sonographic correlate, and patient requests tissue diagnosis rather than surveillance imaging?

- A. BI-RADS 0 B. BI-RADS 1 C. BI-RADS 2 D. BI-RADS 3 E. BI-RADS 4
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ANSWER: D. BI-RADS 3

All asymmetries are described in the BI-RADS atlas as representing a greater volume of non-mass-like fibroglandular-density tissue in one breast relative to the corresponding area in the contralateral breast. Focal asymmetry is defined as being visible on more than mammographic projection (hence a real finding rather than summation artifact), occupying less than a quadrant of the breast. Given that there were no additional abnormalities at diagnostic mammography, no sonographic correlate, and no previous examinations available for comparison, the likelihood of malignancy for an uncomplicated focal asymmetry is greater than 0% but less than 2%. Therefore, based on imaging findings, the most appropriate BI-RADS assessment is probably benign (category 3), which should be accompanied in the

breast imaging report by the concordant management recommendation of short-interval follow-up mammography in 6 months. However, because the patient requests tissue diagnosis rather than surveillance imaging, the report also should indicate this preference, and the patient should be scheduled for percutaneous biopsy. The other choices are incorrect for the following reasons.

BI-RADS 0: This assessment is inappropriate for a diagnostic breast imaging examination, which should be completed before the patient leaves the imaging facility. Rather, one of the final assessment categories (1 through 6) should be chosen.

BI-RADS 1: This assessment is inappropriate when there is a non-normal finding that should be described in the breast imaging report.

BI-RADS 2: There indeed is a finding that should be described in the breast imaging report, but because the finding is not characteristically benign, this assessment is inappropriate.

BI-RADS 4: Although the patient has requested tissue diagnosis, the imaging findings are not suspicious for malignancy. The correct BI-RADS approach is to choose the assessment that reflects the imaging findings, provide a concordant management recommendation for that assessment, and then add a sentence explaining why the specific circumstances of the case provide the need for different management.

REFERENCE FOR QUESTION 2

D'Orsi CJ, Sickles EA, Mendelson EB, Morris EA. Breast Imaging Reporting and Data System (BI-RADS). 5th ed. Reston, VA: American College of Radiology, 2013.

QUESTION 3

What is the most appropriate BI-RADS assessment for the following case scenario: blunt trauma causing breast bruise 3 weeks ago with bruise no longer visible, diagnostic mammography shows developing asymmetry at the site of previous bruise, for which there is no sonographic correlate; given the possibility that the developing asymmetry may represent a resolving hematoma, the radiologist prefers to recommend as management repeat mammography in 1 month to determine whether the developing asymmetry resolves?

- A. BI-RADS 0 B. BI-RADS 1 C. BI-RADS 2 D. BI-RADS 3 E. BI-RADS 4

DISCUSSION RE: ANSWER OPTIONS

ANSWER: E. BI-RADS 4

Developing asymmetry is defined in BI-RADS as a focal asymmetry that is new, larger, or more conspicuous than on a previous examination. Because the likelihood of malignancy for developing asymmetry is substantially greater than 2% (15% at screening mammography, 25% at diagnostic mammography), developing asymmetry is an inherently suspicious mammographic finding. Therefore, despite the clinical scenario suggesting the possibility of resolving hematoma, the correct BI-RADS assessment is suspicious (category 4), which should be accompanied in the breast imaging report by the concordant management recommendation of tissue diagnosis. However, because of the extenuating circumstances in this clinical scenario, the report should contain an extra sentence indicating that biopsy will be deferred for 1 month, at which time repeat mammography will be obtained to determine whether the developing asymmetry has resolved (in which case, biopsy would no longer be needed). The other choices are incorrect for the following reasons.

BI-RADS 0: This assessment is inappropriate for a diagnostic breast imaging examination, which should be completed before the patient leaves the imaging facility. Rather one of the final assessment categories (1 through 6) should be chosen.

BI-RADS 1: This assessment is inappropriate when there is a non-normal finding that should be described in the breast imaging report.

BI-RADS 2: There indeed is a finding that should be described in the breast imaging report, but because the finding is not characteristically benign, this assessment is inappropriate.

BI-RADS 3: Although the preferred management recommendation is very-short-interval follow-up mammography, the imaging features are not consistent with a likelihood of malignancy that is less than 2%. The correct BI-RADS approach is to choose the assessment that reflects the imaging findings, provide a concordant management recommendation for that assessment, and then add a sentence explaining why the specific circumstances of the case provide the need for different management.

REFERENCE FOR QUESTION 3

D’Orsi CJ, Sickles EA, Mendelson EB, Morris EA. Breast Imaging Reporting and Data System (BI-RADS). 5th ed. Reston, VA: American College of Radiology, 2013.

QUESTION 4

What is the most appropriate BI-RADS assessment for the following case scenario: painful palpable lump that corresponds to a noncalcified, circumscribed oval mass at mammography, with sonographic features characteristic of a simple cyst, and patient requests aspiration of the palpable lump for symptomatic relief?

- A. BI-RADS 0 B. BI-RADS 1 C. BI-RADS 2 D. BI-RADS 3 E. BI-RADS 4

DISCUSSION RE: ANSWER OPTIONS

ANSWER: C. BI-RADS 2

The mammographic findings are consistent with a probably benign finding, but the sonographic features of a simple cyst are characteristically benign. When mammography and ultrasound examinations are reported together, and the appropriate assessment differs between the two component examinations, the combined assessment usually reflects the more abnormal examination, except when the less abnormal examination demonstrates the finding to be characteristically benign. As a result, based simply on imaging features, the combined examination should be assessed as benign. How does the patient’s request for aspiration of the painful palpable lump affect this assessment? BI-RADS makes a clear distinction between therapeutic aspiration of a characteristically benign finding and diagnostic aspiration of a finding that is not characteristically benign in order to make a definitive tissue diagnosis. Therapeutic aspiration, involving a benign imaging finding, should be accompanied by a benign assessment because the purpose of the interventional procedure is simply to produce symptomatic relief. Diagnostic aspiration involves a finding that is of sufficient concern to require tissue diagnosis, hence it should be accompanied by a suspicious assessment. Therefore, for the provided scenario, the most appropriate BI-RADS assessment is benign (category 2), which should be accompanied in the breast imaging report by the concordant management recommendation of routine screening mammography in 1 year. However, because the patient requests therapeutic aspiration for symptomatic relief of the painful palpable lump, this additional management recommendation should be made in a separate sentence in the report. The other choices are incorrect for the following reasons.

BI-RADS 0: This assessment is inappropriate for a diagnostic breast imaging examination, which should be completed before the patient leaves the imaging facility. Rather one of the final assessment categories (1 through 6) should be chosen.

BI-RADS 1: This assessment is inappropriate when there is a non-normal finding that should be described in the breast imaging report.

BI-RADS 3: There indeed is a finding that should be described in the breast imaging report, but because the finding is characteristically benign, this assessment is inappropriate.

BI-RADS 4: Although the patient has requested and will undergo an interventional procedure, the imaging findings are not suspicious for malignancy. The correct BI-RADS approach is to choose the

assessment that reflects the imaging findings, provide a concordant management recommendation for that assessment, and then add a sentence explaining why the specific circumstances of the case suggest different management.

REFERENCE FOR QUESTION 4

D’Orsi CJ, Sickles EA, Mendelson EB, Morris EA. Breast Imaging Reporting and Data System (BI-RADS). 5th ed. Reston, VA: American College of Radiology, 2013.

QUESTION 5

What is the most appropriate BI-RADS assessment for the following case scenario: noncalcified circumscribed oval mass at mammography, unchanged from 1 year ago; at ultrasound, mass also circumscribed and oval, hypoechoic, with parallel orientation and no features of malignancy?

- A. BI-RADS 0 B. BI-RADS 1 C. BI-RADS 2 D. BI-RADS 3 E. BI-RADS 4

DISCUSSION RE: ANSWER OPTIONS

ANSWER: D. BI-RADS 3

The case scenario describes a mass that fulfills all the mammographic and sonographic criteria for a lesion that has a greater than essentially 0% but $\leq 2\%$ likelihood of malignancy. The most likely diagnosis is fibroadenoma. If seen at baseline mammography, the proper assessment would be probably benign (BI-RADS 3), recommend short-interval follow-up imaging in 6 months. However, in this case scenario, the mass already is known to be stable for 1 year, so short-interval follow-up imaging is not needed. Given the apparent discordance between the assessment and the associated management recommendation, the correct BI-RADS approach is to choose the assessment that reflects the imaging findings, but then provide a management recommendation that is pertinent to the scenario. Therefore, the most appropriate BI-RADS assessment is probably benign (category 3), which should be accompanied by a management recommendation of follow-up mammography in 1 year. This is done to reinforce to both referring clinician and patient that the “probably benign” surveillance period has not ended, but that the follow-up interval is being lengthened to 1 year due to stability of the mass over the first year of surveillance. The other choices are incorrect for the following reasons.

BI-RADS 0: This assessment is inappropriate for a diagnostic breast imaging examination, which should be completed before the patient leaves the imaging facility. Rather one of the final assessment categories (1 through 6) should be chosen.

BI-RADS 1: This assessment is inappropriate when there is a non-normal finding that should be described in the breast imaging report.

BI-RADS 2: There indeed is a finding that should be described in the breast imaging report, but because the finding is not characteristically benign, this assessment is inappropriate.

BI-RADS 4: A suspicious assessment would be justified only if the mass had enlarged substantially or otherwise developed suspicious mammographic or sonographic features.

REFERENCE FOR QUESTION 5

D’Orsi CJ, Sickles EA, Mendelson EB, Morris EA. Breast Imaging Reporting and Data System (BI-RADS). 5th ed. Reston, VA: American College of Radiology, 2013.

QUESTION 6

Select the single best answer. Use of the new edition of BI-RADS:

- A. Requires internet access
- B. Increases flexibility in breast imaging reporting
- C. Will increase the recall rate
- D. Is mandated by FDA regulations in the United States

DISCUSSION RE: ANSWER OPTIONS

Answer: B. Increases flexibility in breast imaging reporting

The last choice (Option D) is false because FDA regulations do not mandate the use of new edition of BI-RADS. The first three choices all are true but two of them are only partially correct. (Option A) Internet access is required for those who use as electronic version of BI-RADS but not those who use the hard-copy (print) version. (Option C) Use of the new edition of BI-RADS will increase the recall rate for radiologists who continue to make probably benign (category 3) assessments at screening because one of the auditing changes in the new edition is to consider such assessments as positive (hence contributing to the numerator of the recall rate calculation), but those radiologists who follow BI-RADS guidance and do not make probably benign assessments at screening will have unaffected recall rates. The correct answer (Option B) is that the new BI-RADS edition increases flexibility in breast imaging reporting, by separating imaging assessment from management recommendations, thereby allowing the radiologist to report (without causing confusion) those examinations for which imaging-based assessment does not match clinically appropriate management recommendations (the several discordance scenarios described in detail in the new BI-RADS edition).

REFERENCE FOR QUESTIONS 6

D’Orsi CJ, Sickles EA, Mendelson EB, Morris EA. Breast Imaging Reporting and Data System (BI-RADS). 5th ed. Reston, VA: American College of Radiology, 2013.

Lecture 2: Imaging Evaluation of Breast Asymmetries

QUESTION 1

What are the four types of asymmetries described in the 5th edition of BI-RADS?

- a. asymmetry, global asymmetry, focal asymmetry, developing asymmetry
- b. one-view asymmetry, global asymmetry, focal asymmetry, developing asymmetry
- c. asymmetry, global asymmetry, focal asymmetric density, developing asymmetry
- d. asymmetry, global asymmetry, focal asymmetric density, neosymmetry
- e. one-view asymmetry, asymmetric breast tissue, focal asymmetry, developing asymmetry

DISCUSSION RE: ANSWER OPTIONS

Answer: A.

The current BI-RADS lexicon (BI-RADS 5th edition) contains an expanded section on mammographic asymmetries. The terms “focal asymmetry density”, “neosymmetry” and “asymmetric breast tissue” are not contained with the BI-RADS 5th edition lexicon. While “asymmetry” is defined as a one-view finding, the recognized term is not “one-view asymmetry”, but simply “asymmetry”. Hence, the correct choice is (A): asymmetry, global asymmetry, focal asymmetry, developing asymmetry.

REFERENCE FOR QUESTIONS 1

Sickles EA, D’Orsi CJ, Bassett LW, et al. ACR BI-RADS Mammography. In: ACR BI-RADS Atlas, Breast Imaging Reporting and Data System. Reston, VA, American College of Radiology, 2013.

QUESTION 2

The likelihood of a one-view finding detected on only one standard projection at screening being negative (superimposition of fibroglandular structures) is:

- a. 2%
- b. 27%
- c. 50%
- d. 83%
- e. 95%

DISCUSSION RE: ANSWER OPTIONS

Answer: D

Of the 2,023 one-view findings in the study by Sickles, 1,086 were dismissed as superimposition of fibroglandular structures based on information contained within the screening mammographic views (without being recalled for diagnostic imaging). The remaining 937 cases were recalled (interpreted as BI-RADS 0 incomplete: needs additional imaging assessment), and an additional 587 cases were determined to be superimposition of fibroglandular structures upon diagnostic imaging. Therefore, the total number of cases in which one-view finding detected on only one standard projection at screening being superimposition of fibroglandular structures is $1,086 + 587 = 1,673$, which is 83% of the total 2,023 findings in the study. Hence, the correct choice is (D): 83%.

REFERENCE FOR QUESTIONS 2

Sickles EA. Findings at mammographic screening on only one standard projection: outcomes analysis. *Radiology* **1998**;208(2):471-475

QUESTION 3

What is the likelihood of developing asymmetry being malignant?

- a. 5% if detected at screening and 10% if detected at diagnostic mammography
- b. 13% if detected at screening and 27% if detected at diagnostic mammography
- c. 30% if detected at screening and 15% if detected at diagnostic mammography
- d. 50% if detected at screening and 40% if detected at diagnostic mammography
- e. 65% if detected at screening and 80% if detected at diagnostic mammography

DISCUSSION RE: ANSWER OPTIONS

Answer: B

In the study by Leung and Sickles, 36 cancers were diagnosed among 82 biopsies performed in 281 cases of developing asymmetry detected at screening, and 8 cancers were diagnosed among 26 biopsies performed in 30 cases detected at diagnostic mammography. Therefore, the likelihood of malignancy is: $36/281$ (13%) if detected at screening and $8/30$ (27%) if detected at diagnostic mammography. In general, the likelihood of malignancy of any finding detected at diagnostic mammography is higher than that detected at screening (given that screening mammography is performed in nominally asymptomatic patients). Hence, the correct choice is (B): 13% if detected at screening and 27% if detected at diagnostic mammography.

REFERENCE FOR QUESTIONS 3

Leung JWT, Sickles EA. Developing asymmetry identified on mammography: correlation with imaging outcome and pathologic findings. *AJR* **2007**;188(3):667-675