Archives of Surgical Research | Pictorial Perspective

Tips And Tricks To Read A Mammogram: What A Surgeon Needs To Know

Arqam Awais[1], Muhammad Omer Altaf[2], Haroon Shahid[2]

IMPORTANCE Breast imaging is one of the most widely used radiological techniques all over the world owing to its high detection rate of early breast cancers, cost effectiveness and it being an easy to handle modality. Breast cancer is one of the most commonly occurring malignancy in women with a high mortality rate if undetected. Early effective detection has resulted in decreasing the mortality.
The most commonly available breast imaging techniques include ultrasound, mammography, MRI and nuclear techniques. Recent advancements have provided advanced results in terms of lesion detection like full field digital mammography (FFDM) and computer aided detection (Artificial Intelligence). Mammography is one of the best screening tool for breast cancer especially in asymptomatic women above the age of 40 years as demonstrated by various randomized control trials and mass screening programs. The objective of this short communication is to give a brief overview of how to read a mammogram.

KEYWORDS: Mammogram, Breast Cancer, Reading Mammogram, BIRADS Classification

HOW TO CITE Awais A, Altaf MO, Shahid H, Rafique Z. Tips And Tricks To Read A Mammogram: What A Surgeon Needs To Know. *Archives of Surgical Research.* 2021, 2 (3):61-65. https://doi.org/10.48111/2021.03.10.

Pictorial Perspective

Author Affiliations: Author affiliations are listed at the end of this article.

Corresponding Author:
Dr. Arqam Awais MBBS
Radiology Department,
Shaukat Khanum Hospital
Lahore arqamovais@gmail.com
092 – 333 - 4714155
https://doi.org/10.48111/2021.03.10

Mammography is the two-dimensional X-ray representation of breast tissue to detect breast lesion. General mammography can be categorized into two segments i.e. screening mammography and diagnostic mammography. Screening mammography target the asymptomatic women and aims to detect any breast abnormality at an early stage to reduce the incidence of advanced breast disease and thus reducing morbidity and mortality. The diagnostic mammography on the other hand focuses on differentiation of lesions to arrive at a diagnosis followed by suitable treatment method[1].

In technical aspects, there are also two types of mammograms, film screen mammography and digital mammography of FFDM; the main difference among these two is in former the image is presented and stored as radiographic films, while in latter the digital files are stored on computer for post processing.

The interpretation of mammogram has been conducted by breast surgeons in breast clinics as well. Many researches have been performed to determine the accuracy of mammography reporting by surgeons and it showed that surgeons can be involved in double reading of mammograms. The screening mammogram are performed at a larger scale and their reporting is simpler as compared to diagnostic mammograms. A mammogram has two standard views including craniocaudal (CC) and mediolateral oblique views (MLO) of each breast.

The reading of mammogram can be made easier for breast surgeons following a standard sequence and simple tricks.

STEPS TO APPROCH A MAMMOGRAM

First step should be checking for proper acquisition of the mammogram which includes procedure justification, correct exposure, proper positioning, adequate compression of breast tissue while taking images, no skin folding, imaging of the whole breast tissue, coverage of axilla and avoidance of any artifacts during the procedure. Images obtained should be symmetrical.

Second step is identification of laterality, a simple trick to identify the site is straightening the arms with the palmer aspects of both hands facing each other e.g the right hand palmer aspect faces the left hand, this represents that the right breast mammogram both standard views when seen will shows the breast starting from the right of the film and bulk of breast tissue extending away towards the left i.e the palmer aspect of right hand. Vice versa for the left.

Third step is identifying the breast composition, it is classified into 4 categories a, b, c & d[2]. This is in order of increasing breast densities. The higher the density of the breast parenchyma the lower the sensitivity of mammogram becomes and need for additional breast ultrasound[3]

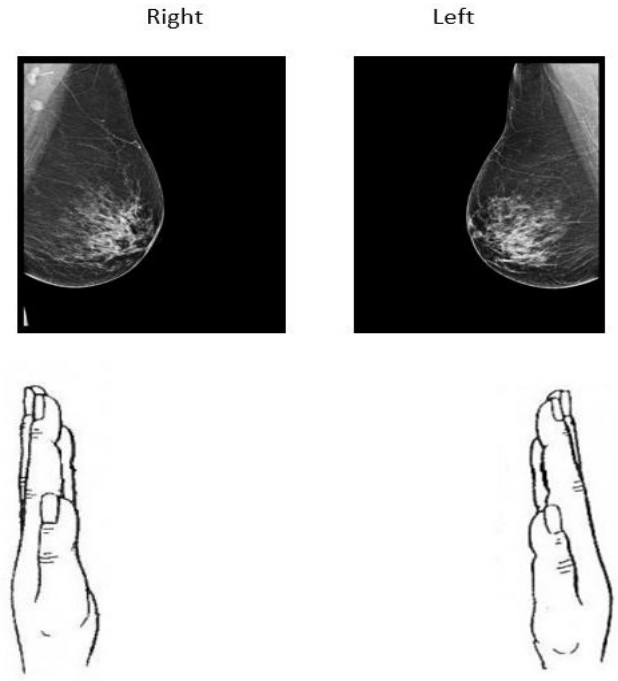


Figure 1: How to interpret the sides of breast on a mammogram. (*Courtesy radiologyassistant.nl* [4])

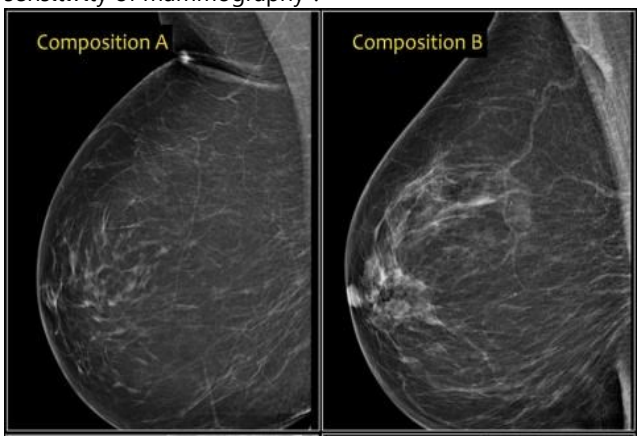
These categories are defined by the BI-RADS area as follows:

A- The breast are almost entirely fatty.
Mammography is highly sensitive in this setting.

B- There are scattered areas of fibroglandular density.
The term density describes the degree of x-ray attenuation of breast tissue but not discrete mammographic findings.

C- The breasts are heterogeneously dense, which may obscure small masses.
Some areas in the breasts are sufficiently dense to obscure small masses.

D- The breasts are extremely dense, which lowers the sensitivity of mammography[2].



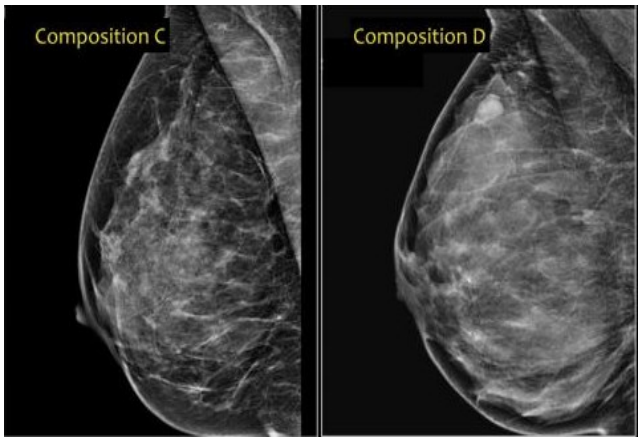


Figure 2: The figures describes the all four grades of breast density as evident on a mammogram (*Courtesy radiologyassistant.nl* [5]).

Fourth step is to identify any abnormality. Any asymmetry is suspicious. The whiter the lesion the denser it is. So any high density mass should be identified. Architectural distortion is suspicious as well. Do you see any suspicious calcifications such as pleomorphic calcification? Large calcifications i.e macro calcifications are usually not concerning. Any calcifications appearing like a vessel i.e vascular calcifications are not concerning. Few examples have been depicted below:

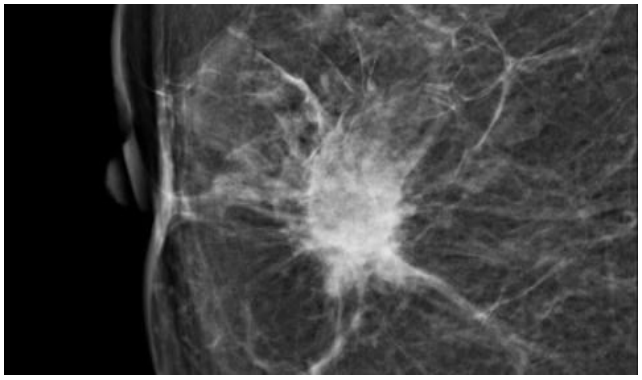


Figure 3: Hyperdense mass with an irregular shape and a spiculated margin. (*Courtesy radiologyassistant.nl* [5])

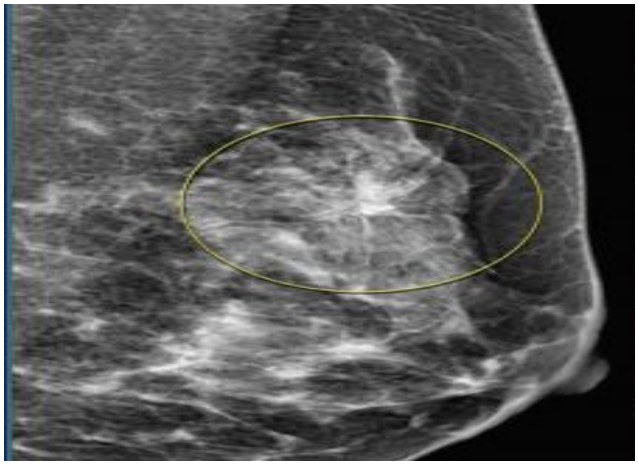


Figure 4: Focal asymmetry (*Courtesy radiologyassistant.nl*).

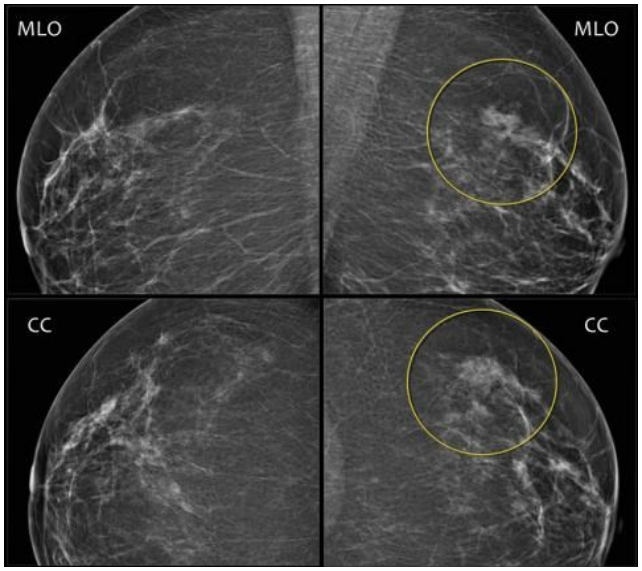


Figure 5: Architectural distortion, this is used when the normal architecture is distorted with no definite mass visible (*Courtesy radiologyassistant.nl* [5]).

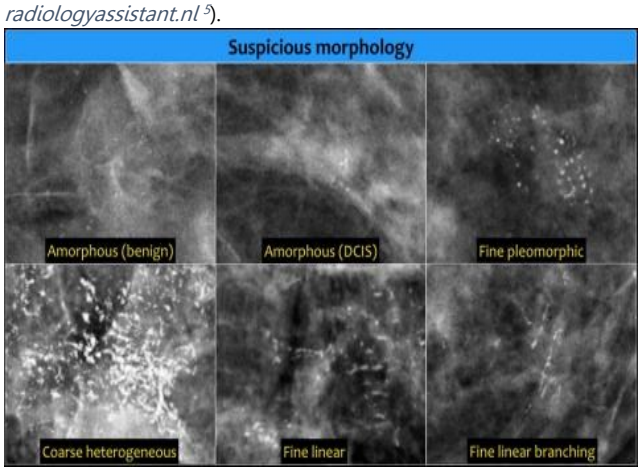


Figure 6: Multiple examples of suspicious microcalcifications (*Courtesy radiologyassistant.nl* [5]).

Fifth step is to localize the location of the abnormality in breast according to the appearance of abnormality on both views of mammogram

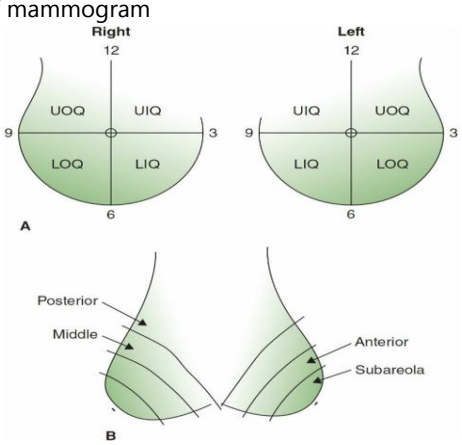


Figure 7: Breast divided into quadrants (*Courtesy radiologyassistant.nl* [6]).

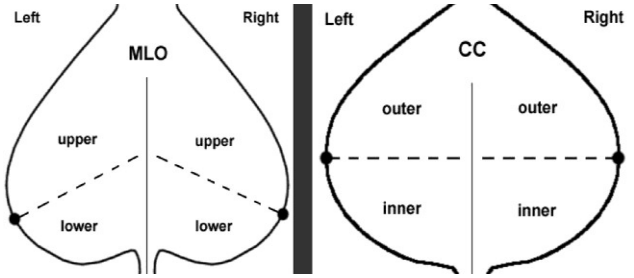


Figure 8: View of quadrants on both standard views of mammogram (*Courtesy radiologyassistant.nl* [5]).

Hence if a mass is seen in the upper aspect on MLO view and outer aspect on the CC view. It will be described as breast mass in upper outer quadrant

SOME TIPS FOR SURGEONS

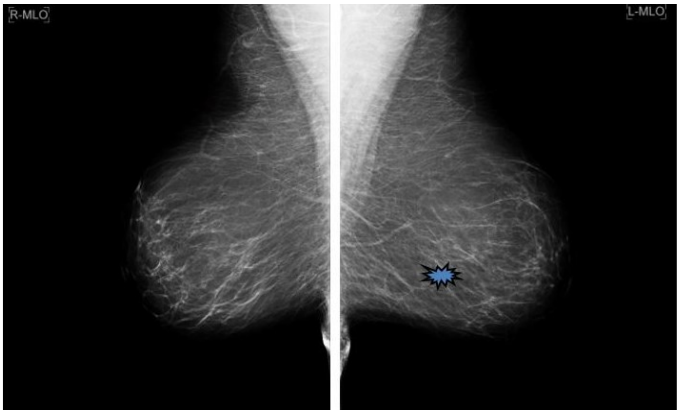
1. When planning of local excision surgery such as lumpectomy one can review and measure the size of lesion on the primary mammogram to get an estimate for amount of excision that needs to be done for negative margins.
2. See if there are pleomorphic calcifications associated with the mass and if the is extending beyond the mass. If it is extending beyond the mass then extended excision needs to be done in the direction where the calcifications are extending to ensure negative margins. Again measuring the abnormality on both views of mammogram can help.
3. Mammograms sometimes don't cover the inframammary skin fold (edges of breast) and axillary tail well particularly when the breast is large so it is advisable to clinically evaluate those areas or get ultrasound assessment done to avoid any concerning lesion hiding in those areas.
4. Zooming or using magnification can help to identify suspicious microcalcifications.
5. If primary breast malignancy had suspicious pleomorphic calcifications then particular attention in follow up post treatment mammograms should be made to identify these calcifications especially the surgical site to detect any early recurrence.

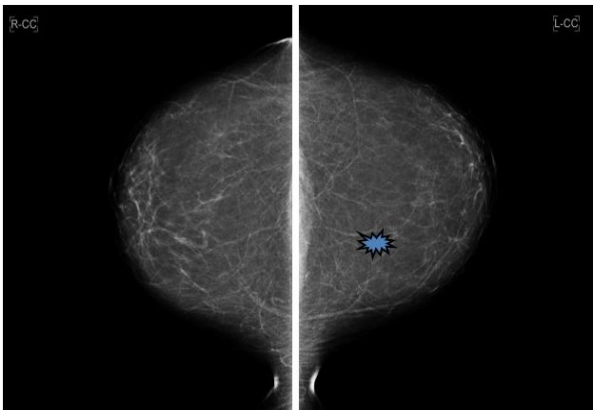
6. Always compare with any previous mammogram.

When in doubt or if there is any discrepancy in the clinical picture and radiographic findings never hesitate to discuss with the radiologist.

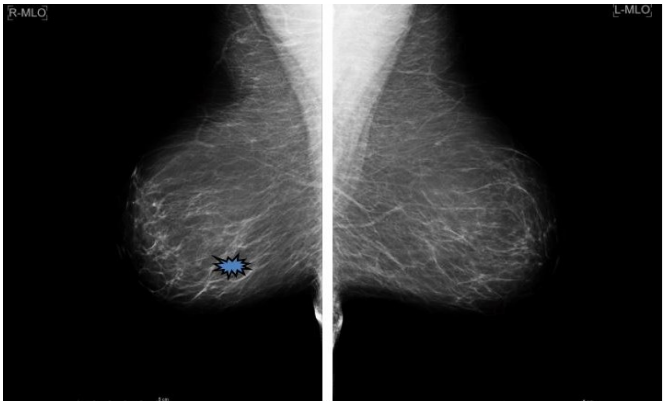
Finally the lesions are always interpreted in light of the BIRAD Classification as depicted in the Table 1.

A





B



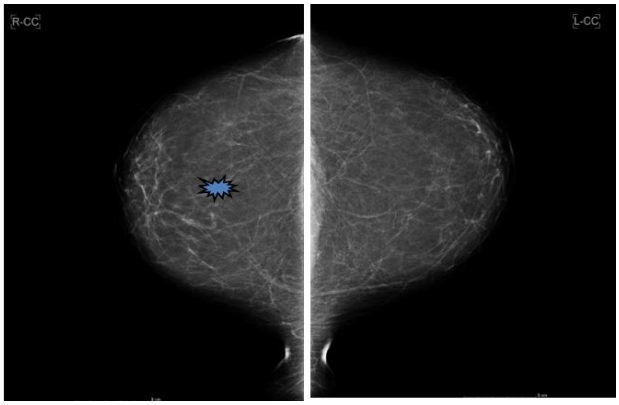


Figure 9: Practice where the lesions is: (*Courtesy radiologyassistant.nl* [5]).

Final Assessment Categories

Category		Management	Likelihood of cancer
0	Need additional imaging or prior examinations	Recall for additional imaging and/or await prior examinations	n/a
1	Negative	Routine screening	Essentially 0%
2	Benign	Routine screening	Essentially 0%
3	Probably Benign	Short interval-follow-up (6 month) or continued	>0 % but ≤ 2%
4	Suspicious	Tissue diagnosis	4a. low suspicion for malignancy (>2% to ≤ 10%) 4b. moderate suspicion for malignancy (>10% to ≤ 50%) 4c. high suspicion for malignancy (>50% to <95%)
5	Highly suggestive of malignancy	Tissue diagnosis	≥95%
6	Known biopsy-proven	Surgical excision when clinical appropriate	n/a

Figure 10: Breast Imaging Reporting and Data System (BI-RADS) score explained: (*Courtesy radiologyassistant.nl* [5]).

ARTICLE INFORMATION Accepted for Publication: September 20, 2021
Published Online: September 29, 2021.
https://doi.org/10.48111/2021.03.10

Author Affiliations: 1. Department of Radiology Shaukat Khanum Hospital Lahore, Pakistan and 2. Department of Radiology, Shalamar Medical and Dental College Lahore.

Financial Support and Sponsorship: Nil.

Conflicts of Interest: There are no conflicts of interest.

Disclaimer: This article does not make one eligible to report mammograms. Proper report by a certified radiologist is still mandatory.

REFERENCES

1. EJ W. Overview of breast cancer. *JAAPA*. 2019;32(10):13-17. doi:10.1097/01.JAA.0000580524.95733.3D
2. D'Orsi C, Sickles EA, Mendelson EB ME. Breast Imaging, Reporting & Data System (BIRADS) | OncoLink. American College of Radiology. Published 2013. Accessed September 27, 2021. https://es.oncolink.org/tipos-de-cancer/cancer-del-seno/investigacion-y-diagnosis/breast-imaging-reporting-data-system-birads
3. Rasheed MEH, Youseffi M, Jamil MMA, Rahman NAA. Medical Imaging and Analysis of Dense Breast Tissue: A Case Study. *Proceeding - 2021 IEEE 17th Int Colloq Signal Process Its Appl CSPA 2021*. Published online March 5, 2021:1-5. doi:10.1109/CSPA52141.2021.9377288
4. Deborah M. Normal mammogram radiographs | Radiology Case | Radiopaedia.org. Accessed September 27, 2021. https://radiopaedia.org/cases/normal-mammogram-radiographs
5. Deborah M. The Radiology Assistant : Bi-RADS for Mammography and Ultrasound 2013. Accessed September 27, 2021. https://radiologyassistant.nl/breast/bi-rads/bi-rads-for-mammography-and-ultrasound-2013
6. Peart O. Mammography and Breast Imaging Prep: Program Review and Exam Prep, Second Edition by Olive Peart Book On Kindle. *McGraw-Hill Education*. Accessed September 27, 2021. https://sites.google.com/vipoz.42web.io/cekbook06/pdfepub-download-mammography-and-breast-imaging-prep-program-review-and-exam-prep-second-edition-by-olive-peart-book-on-kindle