



Case Presentation where MRI shows Superiority as A Modality for Breast Cancer Screening

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Abstract

Background: Common modalities for breast cancer screening include regular clinical breast exams (73%), annual breast sonograms (73%) for high-risk groups, and mammograms (71.5%) recommended every 3 years for high-risk groups. Despite a higher sensitivity of 89.4%, MRI is underutilized, especially among high-risk groups with the means for the test. Kenyan guidelines recommend mammography for normal-risk populations, omitting MRI for routine screening in average-risk populations. This study explores an intriguing case of a 60-year-old post-menopausal lady, with no hormone replacement history, three parities, and a smoking habit. She presented with a left-sided benign cyst but revealed an ominous, undetected lesion on the right breast, emphasizing the limitations of conventional screening modalities.

Method: The patient was admitted for abdominal pain due to gastroenteritis and a breast lump on the left breast for 3 months with a strong family history of breast cancer, so she requested screening for the same. In the process, we found axillary and mediastinal lymph nodes, but the left breast showed a simple harmless cystic lesion. The right breast confirmed a lesion with irregular borders that looked suspicious, and a biopsy confirmed ductal carcinoma of the right breast.

Results: The right breast that had no symptoms or signs, and no abnormality on mammogram, ultrasound, or CT scan, had a grade 3a Ductal Cancer in its initial stage that was seen on a simultaneous MRI.

Conclusion: MRI could be a better choice for screening early breast cancer in high-risk groups and in those who can afford the test.

Keywords

Magnetic Resonance Imaging, Ductal Ca, Mammogram, Sonogram, CT scan

Abbreviations

MRI: Magnetic Resonance Imaging

Background

The most commonly used modalities and their respective sensitivities [1] for screening for breast

cancer are regular clinical breast exams (73%), breast sonograms (73%), recommended annually in high-risk groups, and mammograms (71.5%), recommended

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once every 3 years for high-risk groups - with the notion that this will be able to detect or even over-detect breast cancers at an early stage. It has been noted that MRI has a higher sensitivity of 89.4%, and yet this is rarely done to screen for breast cancer, even in high-risk groups who can afford the test. The Kenyan national guidelines have recommended mammography for screening of the normal-risk population and have not recommended MRI for routine screening of the average-risk population [2].

This is an interesting case where a nearly 60-year-old post-menopausal lady with no previous history of hormone replacement, having parity of 3 and being a smoker, presented with a left-sided breast lump and no signs or symptoms on the right side, with a result of a benign cyst on the left but a very clearly ominous lesion on the right that was not seen on any of the above modalities.

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Method:

A 58-year-old para 3 post-menopausal female presented with severe abdominal pain, which warranted admission and was later determined to be caused by viral gastroenteritis. She was also diagnosed with hypothyroidism and hyperprolactinemia during tests conducted to investigate the undue fatigue she

had been experiencing for several months.

The case takes an interesting turn 48 hours into admission when she requests a breast cancer screening. She had noticed a lump on her left breast for the last 3 weeks, expressing concern due to her sister-in-law's recent breast cancer diagnosis. Both breasts appeared symmetrical in size and shape, with no nipple changes, discharge, or skin alterations. However, a palpable, non-tender, and mobile mass (approximately 1*2cm) was found in the upper outer quadrant of the left breast. No axillary lymphadenopathy was observed. The patient, an ex-smoker with 20 pack years, had no history of exposure to oral contraceptives or hormone replacement therapy, and no family history of breast cancer.

Relief ensued as her mammogram showed normal results. However, a CT abdomen conducted at the time of admission revealed unexplained mediastinal and left axillary adenopathy.

Mammogram Report:

The breast parenchyma exhibits scattered fibroglandular density with no macro or microcalcification. No nodules are present in each breast. Small left axillary nodes are observed (**Fig-1**, **Fig-2**, and **Fig3**).

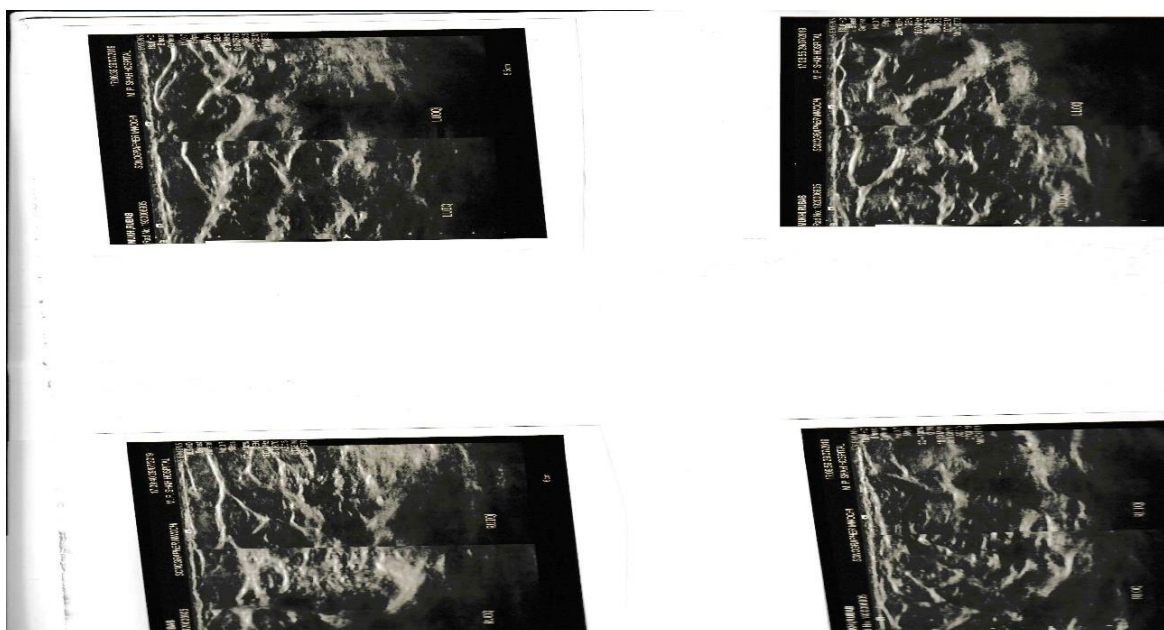


Fig-1: BI-RADS 2, Benign findings

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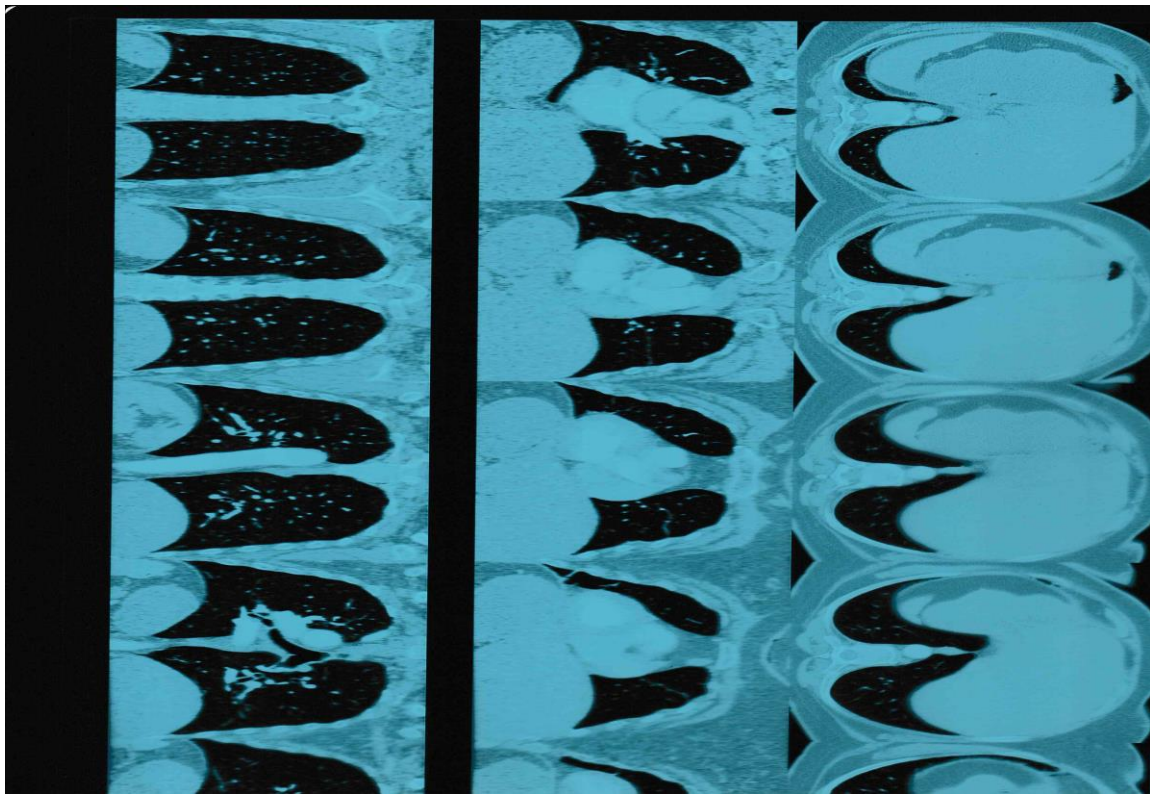
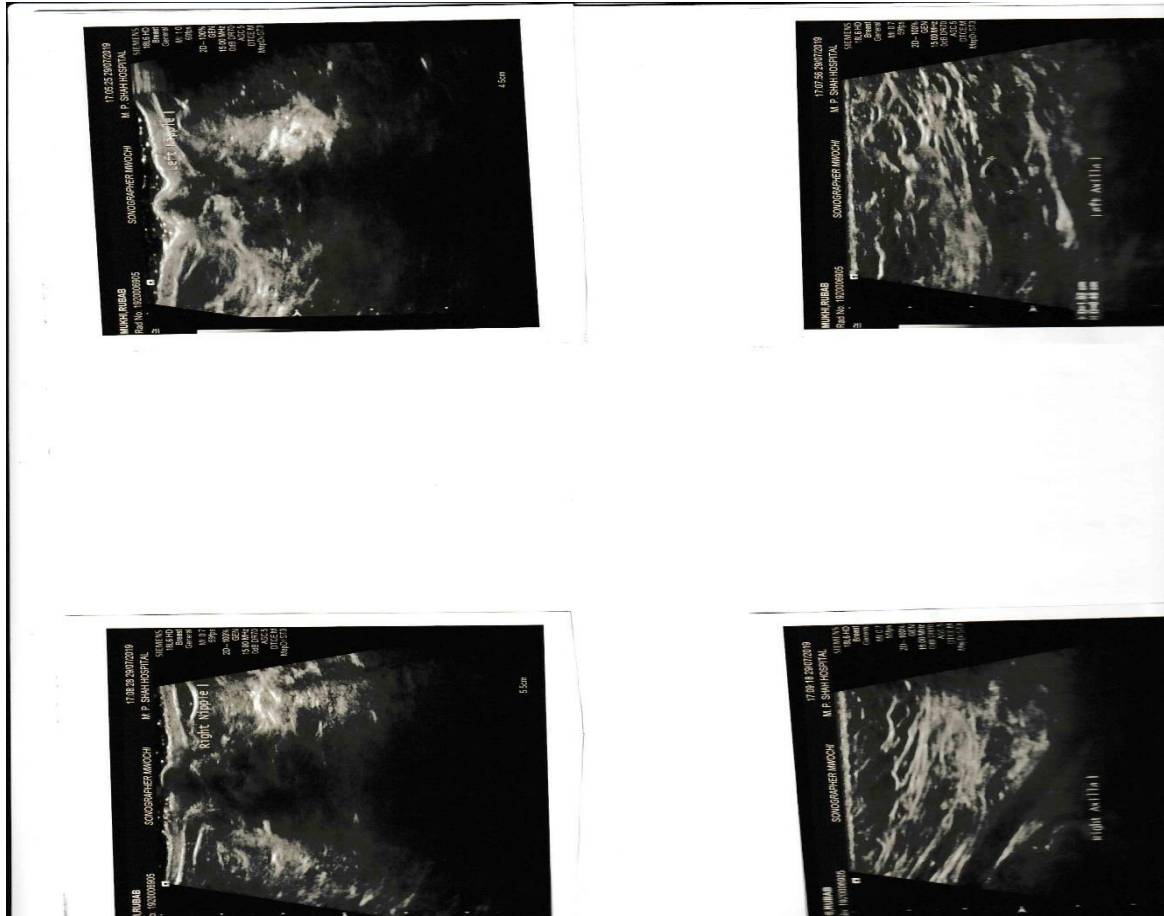


Fig-2: CT Chest and Abdomen images



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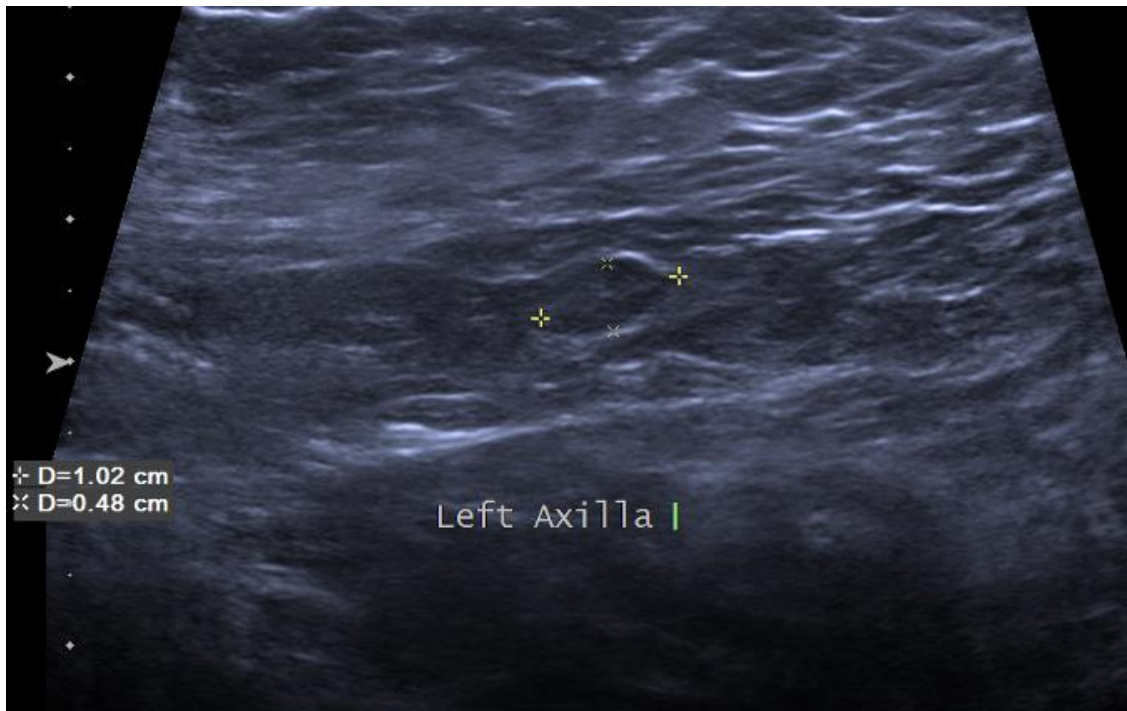


Fig-3: Breast Sonogram images

Ultrasound Report:

- Both breasts are symmetrical and have a normal echo pattern.
- Nipples are not retracted.
- No mass, cystic lesion, or calcification is seen.
- The ducts are not dilated.
- A lymph node measuring 10.2 mm x 4.8 mm is noted in the left axillary region.

Despite the above findings, the family members of our patient wish to have a biopsy taken from the palpable breast mass on the left to ensure it is not malignant. The radiology department insists that for an ultrasound-guided biopsy, they need better visualization of the mass through an MRI of the breasts. The overall benefit, however, turned out to be much more than we had expected.

The MRI confirmed the presence of a fibroadenoma on the left side, likely to be cystic. Surprisingly, it also revealed a lesion on the right breast that had not shown up the day before on any other imaging modality.

MRI Report:

- Right inner lower quadrant mass, with irregular margins measuring 1.6 cm x 0.9 cm.
- It is approximately 2.1 cm from the skin and enhances avidly.
- There is no diffuse skin thickening of the breast. No nipple or skin retraction was present.
- Right-sided retromammary node at the sternomanubrial level (1.8 cm x 1.3 cm).
- Right apical axillary node measuring 2.0 cm x 1.4 cm.

Both lesions were biopsied, and the left breast only had a cystic fibroadenoma, but the lesion on the right turned out to be a grade 3 ductal carcinoma of the breast (Fig-4).



Fig-4: MRI Image

Discussion

The intriguing aspect of this case is the discovery that a lesion, not palpable and undetectable by any imaging modality other than MRI, was revealed to be a malignant grade 3 ductal carcinoma of the breast. Clear evidence supports that MRI is significantly more sensitive than mammograms or breast sonograms in detecting early breast cancer. However, it is important to acknowledge that MRI is a more cumbersome, time-consuming, and costly procedure.

Due to these practical considerations and its relative inaccessibility, MRI is not the preferred screening modality according to the 2018 cancer screening guidelines in Kenya. Another concern is the potential for overdiagnosis, leading to unnecessary invasive procedures and heightened anxiety about the condition's presence.

At an individual level, incorporating patients into the decision-making process becomes crucial as we move towards a more patient-centric approach to managing health conditions globally. This case suggests that offering MRI as an important screening option, with a comprehensive discussion of its pros and cons, allows patients to make informed decisions.

Increasing the frequency of MRI screenings could potentially lead to the earlier detection of many breast cancers, facilitating timely interventions and improving the likelihood of a complete cure for the condition.

Conclusion

The role of MRI in breast cancer screening appears to have been underestimated. This case highlights the importance of giving due consideration to MRI as a viable and accessible option for breast cancer screening, taking into account its associated disadvantages.

Acknowledgment

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Conflict of Interest

The authors have read and approved the final version of the manuscript. The authors have no conflicts of interest to declare.

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