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Case Report

Asymmetric uptake on molecular breast imaging: A manifestation of unilateral breastfeeding ☆

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ABSTRACT

Molecular breast imaging (MBI) is an adjunctive screening tool that can be helpful in evaluating women with dense breasts or in high-risk patients. We present the case of a 43-year-old female who had markedly asymmetric uptake in one of her breasts on MBI study. Further evaluation with diagnostic mammogram and ultrasound did not demonstrate any suspicious findings in the affected breast. Discussion with the patient and additional clinical history revealed that the patient was exclusively breastfeeding from that side, accounting for the unilateral MBI findings.

Introduction

Molecular breast imaging (MBI) has become a supplemental screening tool in the evaluation of women with dense breasts and in high-risk patients, where mammogram alone might be suboptimal. MBI utilizes Technetium-99m sestamibi as the radiopharmaceutical, and increased uptake can be seen in malignancies due to angiogenesis and increased concentration of mitochondria in tumor cells [1]. Positive MBI studies may demonstrate mass or nonmass uptake, both of which warrant additional workup [2]. Benign entities with increased physiologic activity such as fibroadenomas, fibrocystic changes, and pseudoangiomatous stromal hyperplasia can also demonstrate increased radiotracer uptake [1]. Diffuse asymmetric uptake in one breast can be due to a variety of reasons, including ipsilateral malignancy, infection, inflammatory conditions, and asymmetric background parenchymal uptake due to contralateral radiation therapy. We present a case of diffuse asymmetric uptake in a young patient with dense breasts due to her nursing pattern and discuss the imaging findings on MBI and correlative imaging.

Case report

A 43-year-old female presented to our institution for a molecular breast imaging study in the setting of dense breasts. She had a history of uterine fibroids, was otherwise healthy, and

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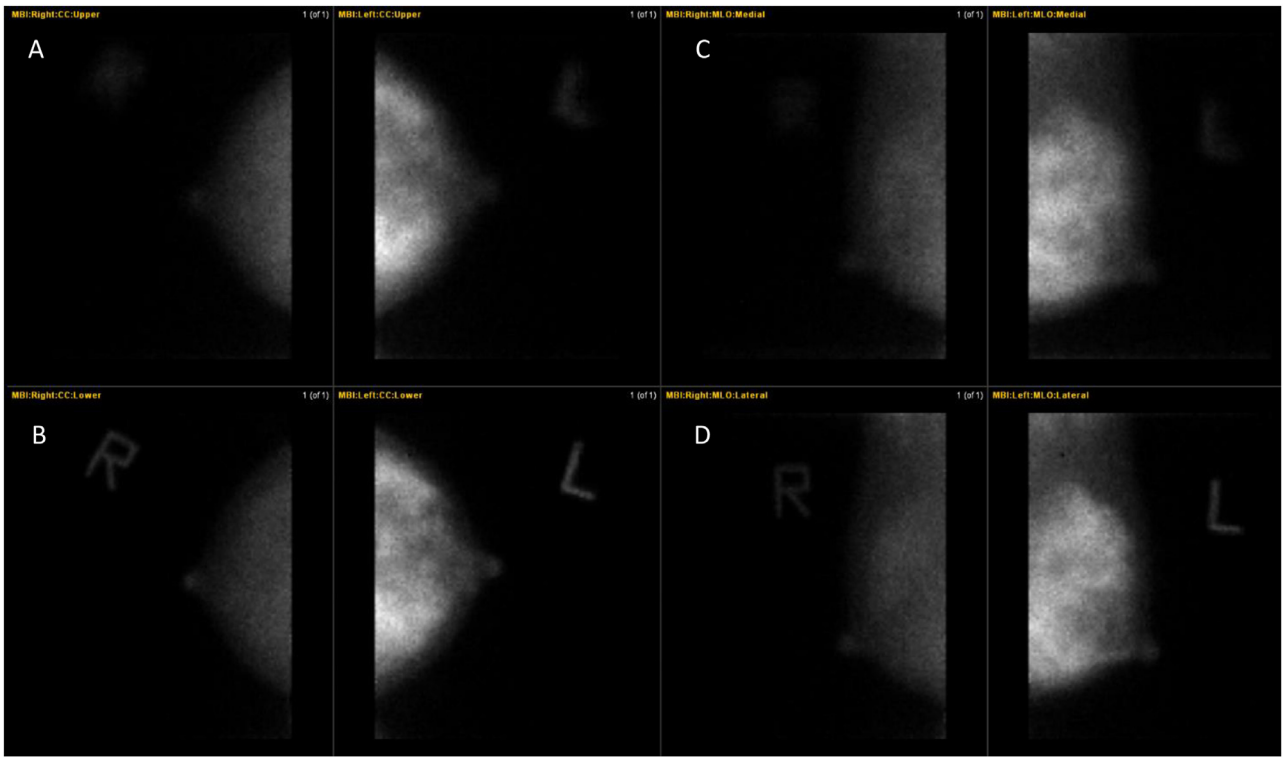

Fig. 1 – Bilateral molecular breast imaging (MBI) study shows both breasts in craniocaudal (CC) compression with images from the (A) upper detectors, (B) lower detectors, and both breasts in mediolateral oblique (MLO) compression with images from the (C) medial detectors, and (D) lateral detectors. The study demonstrates marked diffuse patchy uptake throughout the left breast which is asymmetric when compared to the right breast.

gave birth to her only child about three years ago. Her MBI study demonstrated marked diffuse patchy uptake throughout the left breast which was dramatically asymmetric from the right breast (Fig. 1A-D). Diagnostic evaluation with mammogram and ultrasound of the left breast was recommended for further evaluation.

Diagnostic full field mammograms of the left breast showed a few scattered benign calcifications (Fig. 2A-B). There was no suspicious mass, asymmetry, architectural distortion, or worrisome calcifications. When compared to prior mammograms, there was no significant change in the left breast. Her breasts appeared symmetric in size and density on her screening mammogram performed 2 months prior.

Sonographic evaluation of the left lower inner breast and left upper outer breast was performed given these were the areas with the most intense molecular breast imaging uptake. In these regions, there was dense normal fibroglandular tissue without any focal sonographic abnormality (Fig. 3A-B). Upon discussion of the imaging findings with the patient, she explained that she was currently lactating and nursing almost exclusively from her left breast, thereby explaining the asymmetric physiologic activity and MBI uptake in the left breast. Given the reassuring clinical history, a short term 6-month follow-up MBI was recommended, with the caveat that if she is still nursing at that time, she should nurse or pump prior to the MBI study.

Discussion

One case of incidental asymmetric uptake of Tc-99m sestamibi in a lactating woman has been reported on SPECT myocardial perfusion imaging noted on the cinematic raw images due to unilateral breastfeeding [3]. Asymmetric background enhancement on magnetic resonance imaging (MRI) due to unilateral breastfeeding has also been reported in the literature [4]. However, to our knowledge this is the first case to report this phenomenon on dedicated breast MBI imaging. Other important causes of asymmetric breast enhancement on MRI in a reproductive age female include pregnancy-associated breast cancer and mastitis, with or without abscess formation [5,6]. Unilateral breastfeeding has been reported to be as common as 25%, and reasons include infant's unexplained breast preference, reduced or slow milk flow from the nonpreferred breast, preferential or more comfortable infant positioning on one side, and the presence of a small or inverted nipple on the nonpreferred side [7]. Changes related to breastfeeding on MRI include increased fibroglandular tissue, more prominent background parenchymal enhancement due to greater vascularity, increased T2 signal, and dilated ducts [4]. These hormonally driven changes to the breast parenchyma manifest as increased radiotracer uptake on MBI presumably due to increased fibroglandular tissue density, greater vascularity and

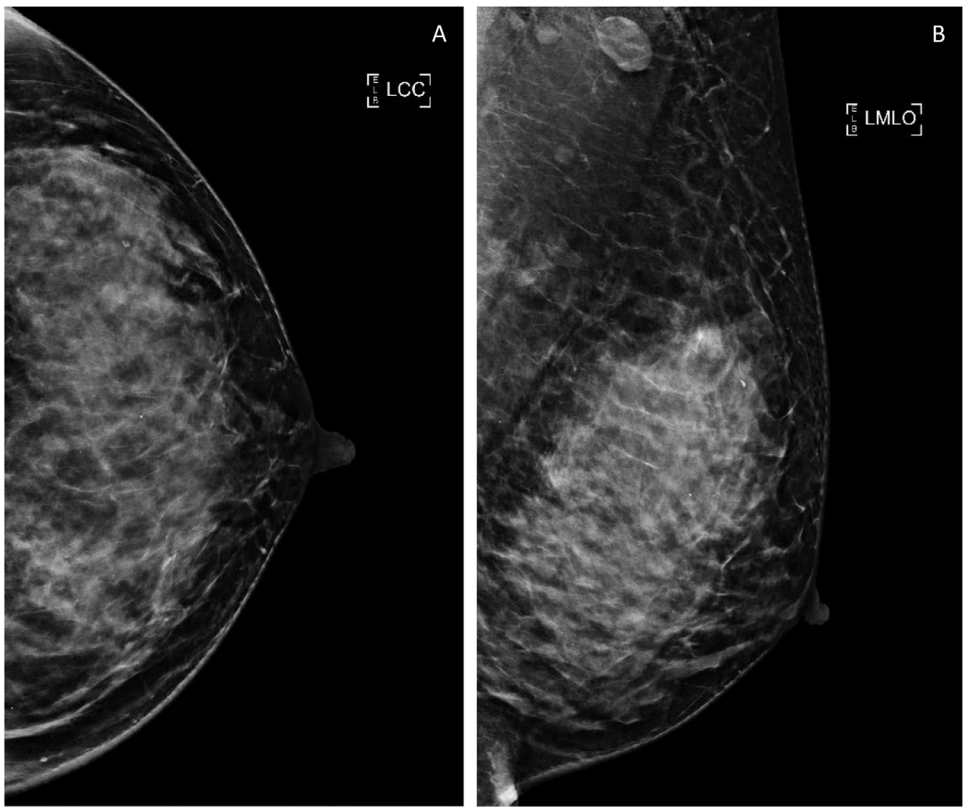

Fig. 2 – Diagnostic full field mammograms of the left breast in the (A) craniocarudal (CC) and (B) mediolateral oblique (MLO) projections show a few scattered benign calcifications. No suspicious mass, asymmetry, architectural distortion, or worrisome calcifications noted.

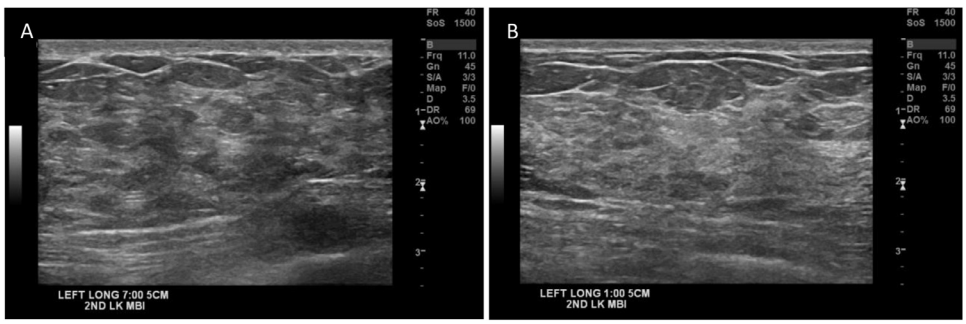

Fig. 3 – Sonographic evaluation of the (A) left lower inner breast and (B) left upper outer breast was performed since these were the areas with the most intense MBI uptake. Ultrasound images demonstrate dense normal fibroglandular tissue without any focal sonographic abnormality in these regions.

delivery of radiotracer, and increased metabolic activity of the lobular tissue.

MBI has been growing as a supplemental screening tool in the evaluation of women with dense breasts and in high-risk patients [1]. While some sources mention that MBI can be performed in a lactating patient without the need for interruption or cessation of breastfeeding [8], others recommend lactating patients who undergo MBI should discontinue breastfeeding and consider discarding expressed milk [9]. However, many articles maintain that because lower doses of Tc-99m compounds are excreted into breast milk, no interruption in breastfeeding is necessary [10-12]. If the patient has strong concerns, pumped breast milk for the first 24 hours after the study can be discarded, thereby minimizing any potential harm.

Conclusion

MBI studies can be helpful as an additional study in our toolkit for screening women with dense breasts and with elevated

risk. Mass or nonmass radiotracer uptake can be seen in malignancies, but can also be seen in benign entities that demonstrate increased metabolic activity. Asymmetric MBI uptake in one breast can be seen for a variety of reasons, similar to asymmetric enhancement on breast MRI. Mastitis, extensive breast cancer, contralateral radiation therapy, inflammatory conditions, and unilateral breastfeeding can all be causes of asymmetric uptake or enhancement. Review of prior imaging and clinical history are paramount in differentiating between these entities and cinching the diagnosis.

Patient consent

Written, informed consent was obtained from the patient for publication of this case.

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