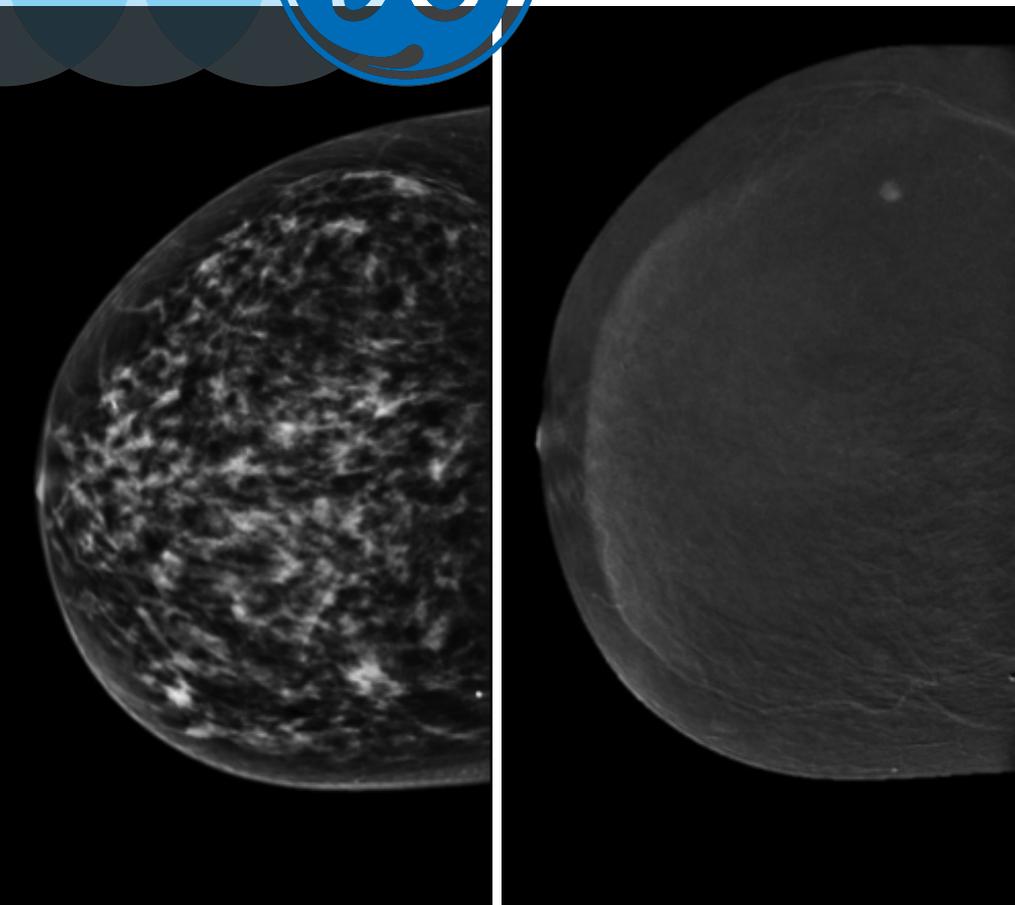


Contrast-Enhanced Spectral Mammography helps to improve breast cancer diagnostics

SenoBright™ mammography, Midwest U.S. hospital



Simple test benefits clinicians and patients

A hospital and university health center in the Midwest United States is using SenoBright, contrast-enhanced spectral mammography (CESM), to help obtain quick and definitive diagnoses.

Clinicians have found the SenoBright technique from GE Healthcare to be an effective alternative to MRI as a follow-up to ambiguous mammograms, which are common in women with dense or nodular breast tissue.

The technique, performed on the same mammography system as the standard breast screening exam, can be completed immediately after standard mammograms so that patients are spared the anxiety of waiting days for a diagnosis.



The hospital at a glance

The Midwest hospital using SenoBright is a 400-bed facility and part of a multi-state health network. It offers a full spectrum of care, including comprehensive women's health and cancer care services. Its breast cancer center provides care, education and support from screening and diagnosis to treatment and follow-up. Breast imaging offerings include standard digital mammography screening, 3D mammography (digital breast tomosynthesis), computer-aided detection, ultrasound studies and ultrasound-guided biopsy, stereotactic biopsy, breast MRI, and breast-specific gamma imaging (BSGI). SenoBright from GE Healthcare was added in January 2014, and the breast center performs up to 100 SenoBright exams per month.

Clinicians in the hospital's breast-care center were interested in new ways to visualize breast tissue and improve diagnostic accuracy.

Follow-up for ambiguous mammograms

"We're always looking for new tools in the toolbox," said Dr. Julie Reiland, breast surgeon. "Mammography, ultrasound and MRI are all good tools, but none of them are perfect. So when we can add another tool that looks at the breast in a completely different way and gives us new information, that's a tool we need to look at. I like how easy it is for my patients to tolerate, I like that it's less expensive than an MRI."

Dr. Josie Alpers, radiologist, observed, "Women can come in from outlying facilities, and have this exam and complete workup, and possibly even biopsy, all on the same day, and know that they are completely done with their imaging. It's a huge advantage."

New imaging technique enhances confidence

Physicians at the hospital say the SenoBright technique has improved their diagnostic confidence and changed the way they manage patients. Dr. Reiland observed, "I have patients who are claustrophobic or who cannot lie still for an hour, and an MRI would be very challenging for them. It is very helpful to be able to offer another advanced imaging technique that gives us a much better idea what the breasts look like."

Dr. Josie Alpers, radiologist, added, "We had a huge unmet need, especially with complex mammography, multiple bilateral masses or cysts, difficult patients, young patients, and high-risk patients who were not getting completely diagnosed with standard mammography and ultrasound. We use SenoBright quite a bit in women who have known breast cancer or are very suspicious for breast cancer, to look for extent of disease as well as multiplicity and bilaterality. We always perform the SenoBright exam on both breasts."

Technique proved simple to implement

The hospital adopted SenoBright technology promptly after breast surgeons and radiologists learned about it. "I have been a champion of alternatives to MRI for secondary diagnostics in very difficult breast cases," Dr. Reiland stated.

Jill Schultz, director of breast health, went to work quickly to integrate the SenoBright procedure into the breast center: "We worked very closely with GE to establish best practices and decide how to structure our workflow. We also worked with our advisory board and our lead radiologists to establish what our program should look like."

The basic procedure is simple. In the exam room, the patient is seated, an IV is started, and the contrast injection is performed. After about two minutes, the imaging sequence is started. Jasele Brue, technologist, observed that patients experience the exam largely similar to mammogram and tolerate it well.

A cost-effective alternative exam

Hospital staff members see significant economic benefits to SenoBright. Schultz noted that the hospital can use well established Current Procedural Terminology (CPT®) codes* for SenoBright that simplify reimbursement. Dr. Reiland noted, "In patients with dense breasts or nodularity who might not meet the risk status criteria for MRI, I can get SenoBright paid for. It is very beneficial to use something that is financially better for everyone, including the insurance companies."

*CPT codes available in the USA.

Patients appreciate diagnostic clarity

Dr. Reiland noted that showing the images to patients is "extremely powerful. I review all of the SenoBright images myself. I can show the pictures on the computer and say, 'This is what your breast looks like in a regular mammogram, and this is what your SenoBright looks like.' They really appreciate seeing those images and knowing there's nothing going on with their breasts, or that there's only one lesion and there's nothing going on in the rest of the breast. When they look at mammograms or ultrasound, they say, 'I don't know what I'm looking at.' But when they look at SenoBright, it's so obvious."

It is very helpful to be able to offer another advanced imaging technique that gives us a much better idea what the breasts look like.

Dr. Julie Reiland
Breast Surgeon



Jill Schultz
Director of Breast Health



Dr. Josie Alpers
Radiologist



Dr. Julie Reiland
Breast Surgeon



Jasele Brue
Technologist

We use SenoBright in women who have known breast cancer or are very suspicious for breast cancer, to look for extent of disease as well as multiplicity and bilaterality.

Dr. Josie Alpers
Radiologist



Invasive Ductal Carcinoma

History

Patient presented for a baseline mammogram with palpable right breast lump.
Heterogeneously dense nodular tissue with regional amorphous calcifications and 4-5 discrete masses.
Multiple findings on ultrasound. A CEMM was recommended.

Technique

Injection:
Iodine Contrast volume: 95 ml injected at a flow rate of 3 ml/sec with pressure injector.
Acquisition:
4 standard mammographic views.

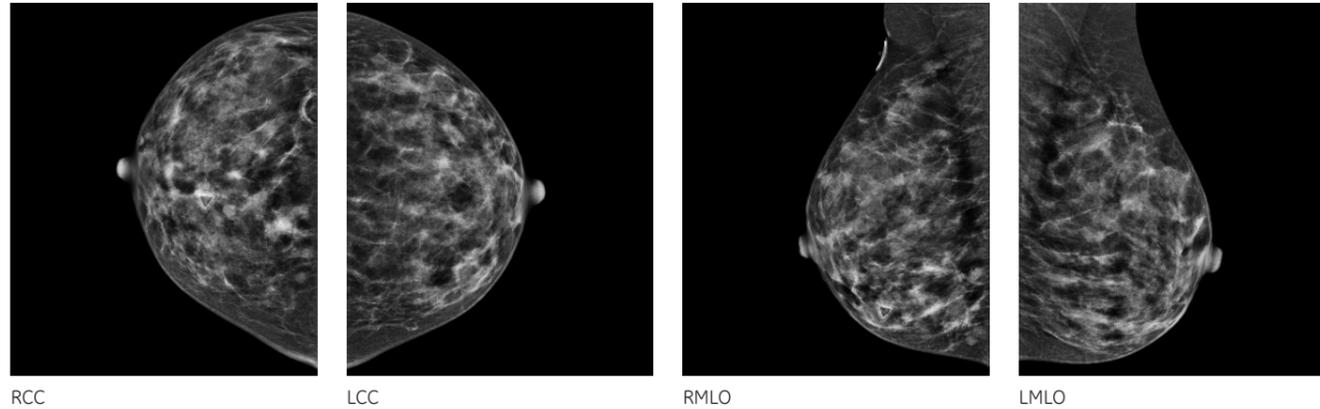
CESM Results

CESM showed a large area of enhancement in the lower inner quadrant (CESM images).

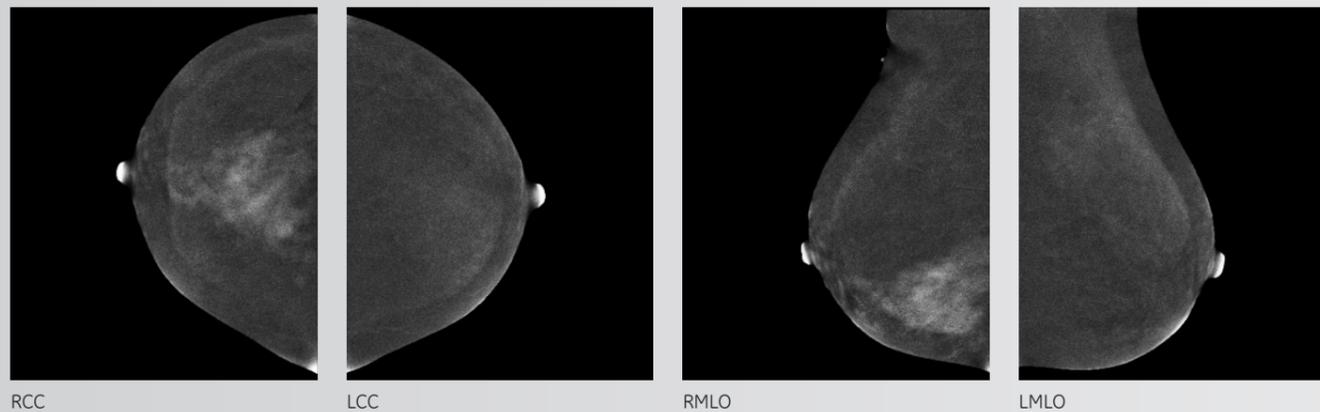
Conclusion

Ultrasound biopsy was performed and yielded multiple invasive ductal carcinoma pathologies.

CESM Low energy images



CESM images



Case solving: Negative

History

Screening mammogram showed heterogeneously dense tissue with new 11 mm nodule on left CC view only.
Spot compression views confirmed nodule and a CEMM was recommended.

Technique

Injection:
Iodine Contrast volume: 111 ml injected at a flow rate of 3 ml/sec with pressure injector.
Acquisition:
4 standard mammographic views.

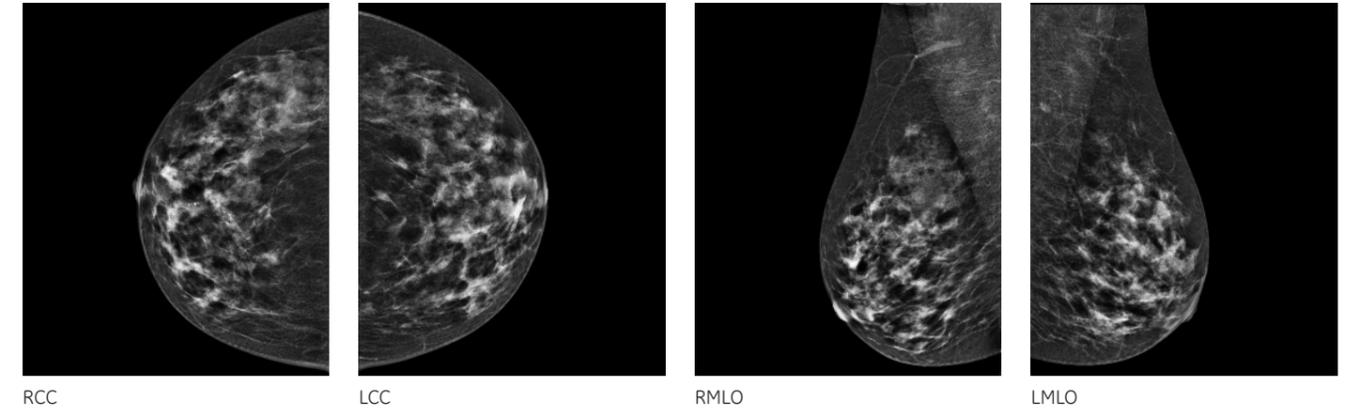
CESM Results

CESM showed no areas of contrast enhancement (CESM images).

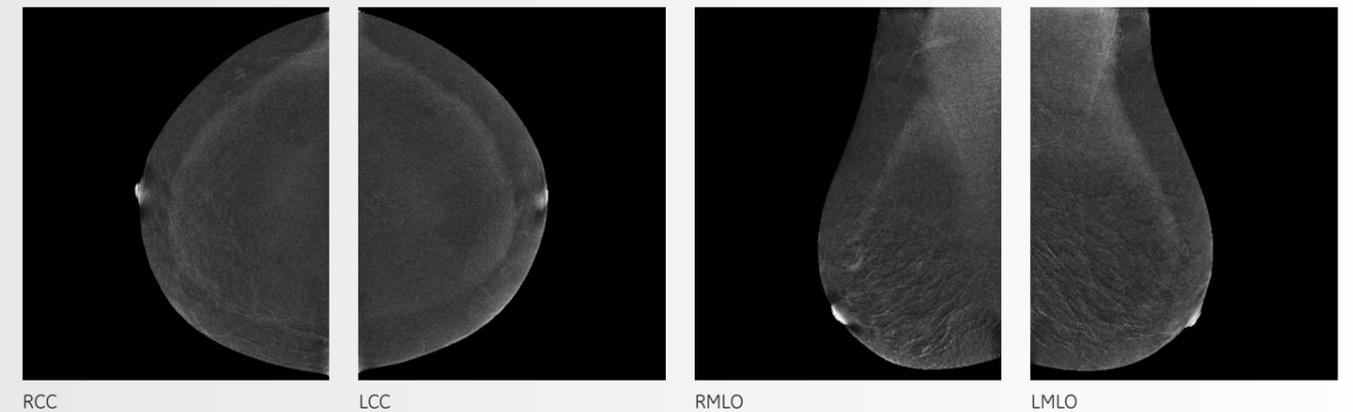
Conclusion

CESM confirmed a negative exam. This patient returned to routine screening.

CESM Low energy images



CESM images



Extent of Disease and Neo-adjuvant Chemotherapy Monitoring

History

Patient with strong family history and very dense tissue. Presented with palpable left breast lump, after a negative mammogram ten months prior. Left diagnostic was indeterminate. Ultrasound revealed a mass measuring 1,5 cm. The mass was solid, cystic and hypo echoic with an irregular margin mass. A bilateral CEMM was performed.

Technique

Injection:
Iodine Contrast volume: 113 ml injected at a flow rate of 3 ml/sec with pressure injector.
Acquisition:
4 standard mammographic views.

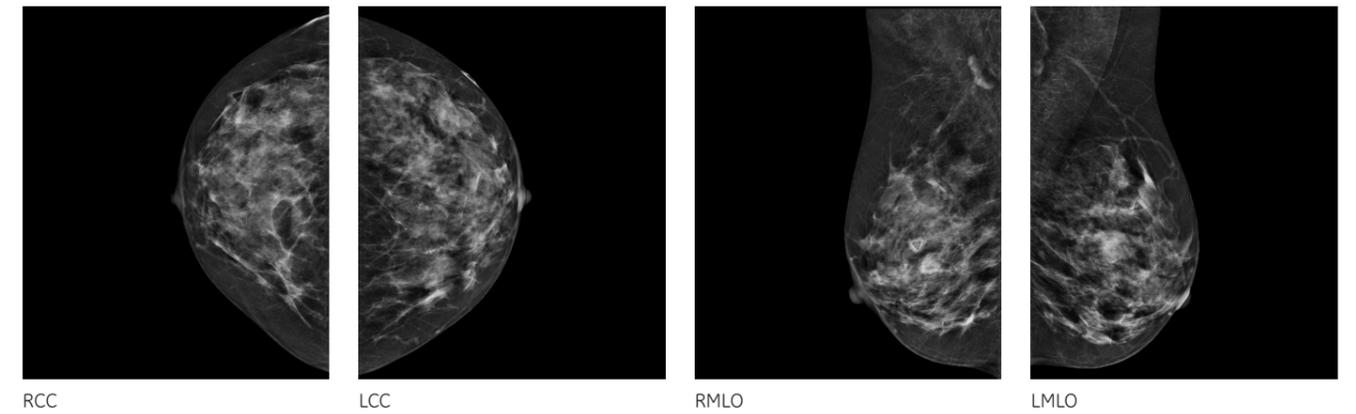
First CEMM Results

Bilateral enhancement was noted on CEMM images (First CEMM images). The Ultrasound exam performed after CEMM confirmed the 2 findings, corresponding to palpable and CEMM abnormalities. Bilateral axilla ultrasound was also performed both were negative. Bilateral biopsies were performed and showed invasive ductal carcinoma grade 3 on palpable left side. Right incidental finding showed invasive ductal carcinoma grade 3 also. The patient was treated by chemotherapy.

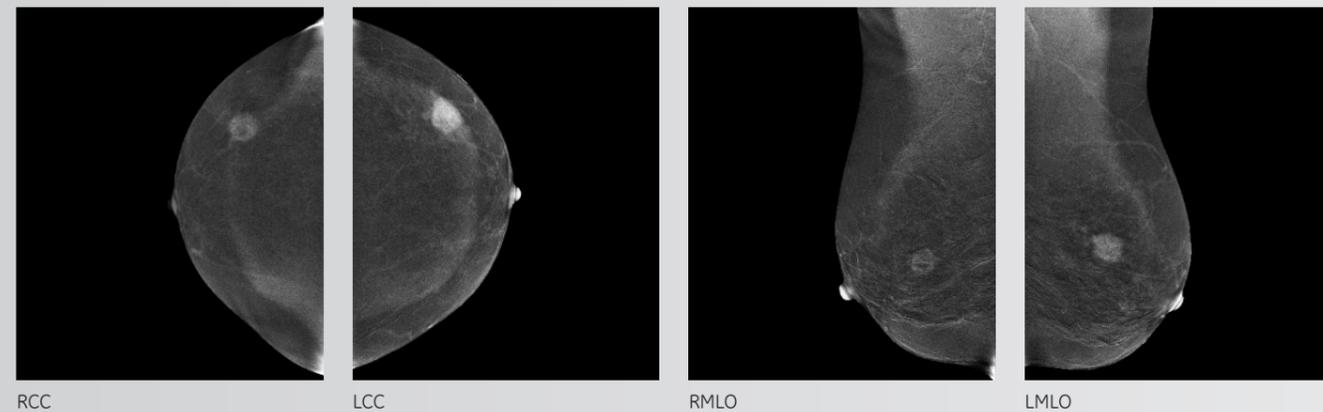
Second CEMM Results

A CEMM follow-up exam was performed after 3 months post-neoadjuvant chemotherapy and demonstrated an excellent response to the treatment (Second CEMM images) and post biopsy clips in place (CEMM Low energy images).

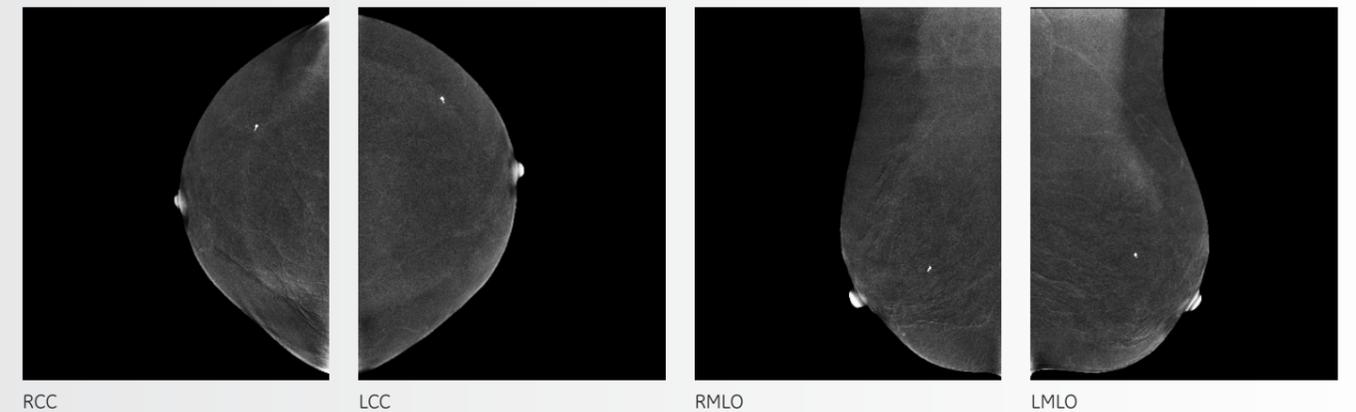
CEMM Low energy images



First CEMM images



Second CEMM post-neoadjuvant chemotherapy images



Case solving: Negative

History

Screening mammogram indicated 8 bilateral nodules. CESM was recommended.

Technique

Injection:
Iodine Contrast volume: 133 ml injected at a flow rate of 3 ml/sec with pressure injector.

Acquisition:
4 standard mammographic views.

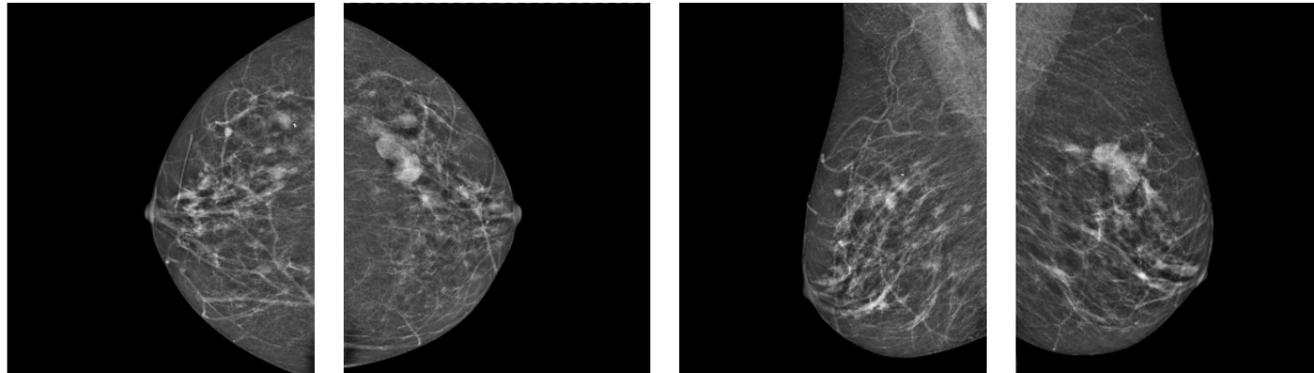
CESM Results

CESM Low energy image showed multiple bilateral findings corresponding with new upper-outer quadrant bilateral masses compatible with cysts. (Standard mammogram images).
CESM recombined images showed no enhancement (CESM images).

Conclusion

After the CESM negative exam, the patient was recommended for routine screening in one year.

CESM Low energy images



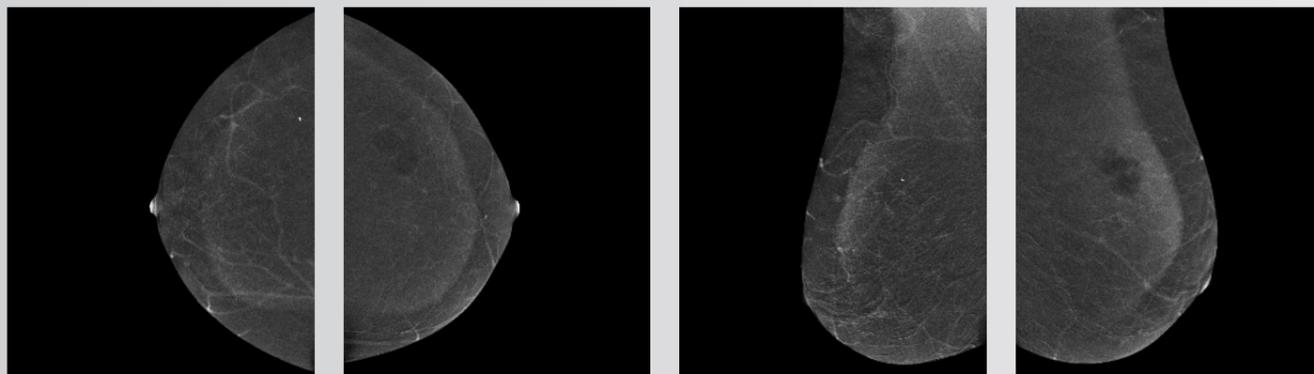
RCC

LCC

RMLO

LMLO

CESM images



RCC

LCC

RMLO

LMLO

The SenoBright technique

Performed after an inconclusive mammogram and ultrasound, the SenoBright exam takes about seven minutes and uses a standard intravenous iodine contrast injection to highlight areas of unusual blood flow. In the majority of cases, patients can get the results on the same day as the exam. The technique uses multiple X-ray exposures to reduce background signal, effectively highlighting contrast-enhanced areas in the breast images. It delivers two images per view:

- A low-energy image that uses standard mammographic techniques and represents tissue density.
- A recombined image that is contrast-enhanced to highlight suspicious areas, making it easier for physicians to see and diagnose lesions.



Women can come in from outlying facilities, and have this exam and complete workup, and possibly even biopsy, all on the same day



Dr. Josie Alpers
Radiologist





About GE Healthcare

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