

Breast Magnetic Resonance Imaging

RTS 3

Breast MRI

It is known that breast cancer is the leading cause of death for women ages 40-49 in the United States according to the Journal of the National Cancer Institute. A 40-year-old woman has a 2 percent chance of being diagnosed with invasive breast cancer or ductal carcinoma in situ in the next 10 years, and her chance of dying from breast cancer during this decade is 0.3 percent.¹

When thinking about the diagnostic world and women's health, magnetic resonance imaging is the most sensitive modality that is currently available for imaging primary or recurrent breast cancer. It has been known to be helpful in predicting disease extent, finding primary cancer in young high-risk patients, and differentiating scar from current cancer tissue.

Even though breast MRI's are becoming more and more common. It is a good idea to know what to expect when going through a breast MRI study. To break down simply what an MRI is, the MRI machine has a large, central opening, that the patient will be placed in. The machine creates a magnetic field around the patient and uses radio waves to excite the hydrogen atoms in the patients' body. This is a process that the patient won't feel, but he/she may hear loud sounds coming from inside the machine (see Figure 1).²

Positioning of the patient to accomplish the exam can be difficult and uncomfortable for the patient having the exam done. The patient is placed lying face down on a device with surface coils connected to the sides of the breasts when the patient is positioned. While the patient is lying face down, his/her breasts are placed in a specific structure and the coils are placed on the lateral side of each breast (see Figure 2).³



Figure 1. Cartoon interpretation of patient positioning of breast MRI.²

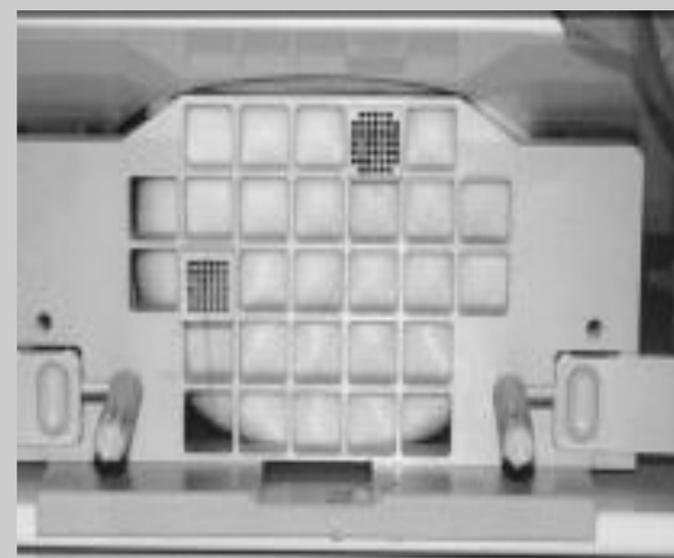


Figure 2. Breast shown and compressed for needle localization by lateral grid.³

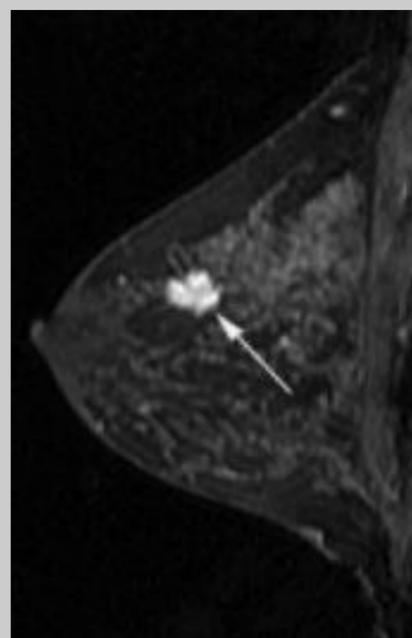


Figure 3. Sagittal postcontrast T1 image showing a 1.3-sm mass.⁴

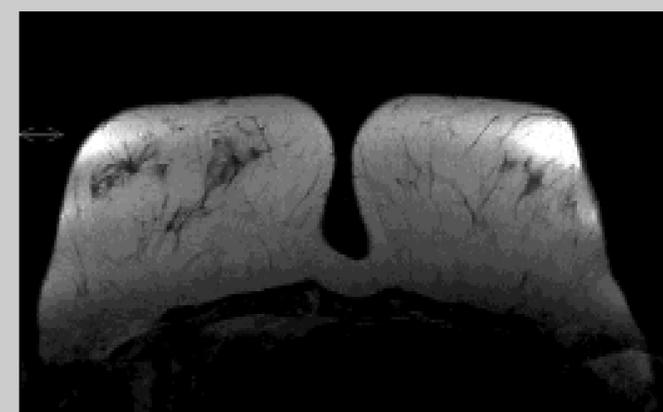


Figure 4. Precontrast image of a known lesion in the lower outer quadrant.⁵

Results of Breast MRI

Diagnostic MRI breast imaging is another helpful tool for physicians to use when looking at women's health. According to the Mayo Clinic, a few reasons a doctor might recommend a breast MRI include, being diagnosed with breast cancer and needing to determine the stage of cancer, suspected leak of rupture of breast implant, strong family history of breast cancer or ovarian cancer, very dense breast tissue, along with a few more. A breast MRI is used in addition to a mammogram or any other breast-imaging tests. It is not recommended to be used as a replacement mammogram.²

Benefits of Breast MRI

Breast MRI is not only used for staging, but in helping screen for cancer. In 2008 a study was conducted to determine if a breast MRI was more accurate than mammography and ultrasound when delineating residual tumors following neoadjuvant chemotherapy. Triple breast imaging, which included, MM (mammography), US (Ultrasound), and MRI were completed prior to the study to evaluate. The use of breast MRI scanning in this group of women that went through neoadjuvant chemotherapy led to a more accurate preoperative assessment of the response than mammography or ultrasound. Breast MRI can detect cancer in the breast that could be missed by mammography and physical examination at the time of the initial diagnosis (See Figure 3 & 4).^{4,5}

References

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