Dr Gundry comprehensively discusses the role of breast magnetic resonance imaging (MRI) in staging and screening breast cancer. I will emphasize and expand on some of the author’s key points.

As additional disease is now detected by breast MRI, we have seen changes in recommended and chosen surgical management. In a recent review of MRI-detected invasive breast cancers performed at Memorial Sloan-Kettering Cancer Center (MSKCC),[1] 68% of the patients were treated with mastectomy. This is a much higher percentage than the average 20% to 25% traditionally performed at MSKCC. This 43% to 48% increase in mastectomy rate obviously raises some serious issues including considerations of mortality and morbidity. Although we cannot be certain that breast MRI reduces mortality rates, we can be certain that it detects more cancers. Knowing that the main principle underlying local management of breast cancer is to excise all cancer prior to adjuvant chemotherapy or radiation, the role of MRI is clearly important.

The role of MRI in detecting mammographically occult primary cancers in the setting of known metastasis has also been well discussed. When the primary tumor can be identified, breast conservation can be performed without influencing survival. Also, in the setting of more advanced metastatic disease, appropriate chemotherapy can be much more effective when the primary site of malignancy is known.

Thus far, breast MRI has been shown to be the most accurate method in assessing response to neoadjuvant chemotherapy. As the author nicely explains, response can be indicated not only by a change in the size of the tumor but also by a change in its kinetics. Such assessment has been a valuable tool in the management of locally advanced disease.

Breast Cancer Screening With MRI

Studies have recently demonstrated the ability of MRI to detect mammographically occult breast cancer in high-risk patients. Kriege et al[2] found that MRI detected more cancers than mammography in this group of patients. Some cancers were detected by mammography and not MRI, thereby highlighting the fact that MRI is not here to replace mammography. Warner et al[3] demonstrated a similar outcome in high-risk patients, detecting more cancers with MRI than with either mammography or sonography. One question nevertheless arises: Will the increased sensitivity of breast MRI result in a decrease in mortality from breast cancer? Tumor size and stage has been demonstrated to be more favorable in the MRI surveillance group in the study from the Netherlands.[2] Warner et al also showed all incident cancers to be stage I or in situ lesions. These results are very promising for the usefulness of MRI.
Although the positive predictive value in this high-risk group has been demonstrated to remain high (46% in the Warner et al group), in a lower risk setting this would be substantially lower, suggesting a less favorable risk-to-benefit ratio.

**The Future**

Breast magnetic resonance spectroscopy (MRS), although still not approved by the US Food and Drug Administration, may be advantageous in increasing the positive predictive value of breast MRI. Preliminary results from our prospective study at MSKCC[4] demonstrated a 46% increase in the positive predictive value of MRI with MRS. In addition, MRS was shown to have a sensitivity of 100% and a specificity of 89%. To date, this method has only been used for lesions ≥ 1 cm in diameter. Additional research is needed to further evaluate the use of this technique in smaller lesions and DCIS.

**Conclusions**

The role of breast MRI is rapidly increasing in the clinical setting. Results from ongoing trials have been favorable, and it appears that this modality is here to stay. While technology is developing with promising outcomes, sensible use is prudent. Breast MRI has not replaced mammography, whose role in decreasing breast cancer mortality has been well established, but must be used in tandem.

**Disclosures:**

The author has no significant financial interest or other relationship with the manufacturers of any products or providers of any service mentioned in this article.

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