MR breast imaging - does it have a place in your practice?

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The incidence of breast cancer appears to be increasing worldwide, especially in Western countries, and also in South Africa. The demand among patients for breast cancer screening is increasing as they become better informed about the benefits of early detection. Radiologists have an important role to play in educating patients on the benefits of breast screening for cancer. MR breast imaging shows great promise for the early detection of cancer in mammographically dense breasts found in some younger women. The sensitivity of MR approaches 100% for invasive malignancy, but it is lower for intraductal cancer, varying between 40% and 100%.[1] However the specificity for cancer is much lower, ranging from 37% to 70% in most series.[1] This is due to comparing different study populations, different imaging protocols, and different interpretation criteria. However, to confound the issue further it is important to remember that the normal breast parenchyma can enhance focally following gadolinium injection in pre-menopausal women.[2] Contrast enhancement is minimal in days 7 - 20 of the menstrual cycle and this is the best time to image the breast using MR. [3]

The role of breast MR imaging is not yet clearly defined in relation to mammography and ultrasound but it is important in solving difficult cases with equivocal mammogram and ultrasound findings. It has been demonstrated to be superior to other modalities in accurately determining the tumour stage for preoperative staging and detecting multifocal tumour involvement.[1] It is useful in detecting residual or recurrent tumour following lumpectomy if the study is performed 28 days or more following the surgery.[4] MR is especially useful in detecting invasive lobular cancer, which is often multifocal or bilateral. Lobular cancer does not usually demonstrate a desmoplastic response and this makes detection more difficult on mammography.[1] Breast MR imaging has been demonstrated to be more sensitive than screening mammography in the detection of familial cancer which may be multifocal in patients who are BRCA1 or 2 positive or who have a strong family history of breast cancer.[5]

As in all investigations, good technique is essential for diagnostic studies. Fat suppression techniques and gadolinium enhancement are critical in detecting small cancers. New techniques are appearing on the diagnostic horizon, namely MR elastography and MR multivoxel spectroscopy. MR elastography is an interesting technique being investigated in Germany to stage breast cancer accurately. This technique images the elastic properties of the breast to detect any desmoplastic response from occult cancers.[6]

There is a steep learning curve for radiologists interpreting MR breast studies. The best results are achieved working in a multidisciplinary team together with breast surgeons, oncologists and pathologists.

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