

## Imaging of the Dense Breast

Professor Fiona J Gilbert

MRI of the breast is much more sensitive than mammography in the detection of breast cancer. The rapid contrast enhancement by tumours allows detection of small malignant lesions that can be occult on mammography. This is a particular advantage in younger women with dense breasts. However dense fibroglandular tissue, particularly when found in premenopausal women can also enhance to the same extent as cancers which can cause some difficulty in diagnosis. It is essential that a rapid high resolution imaging protocol is used in order to detect small malignant lesions to improve conspicuity of small lesions. Ideally post contrast sequences of less than minute are required in order to see small cancers <1cm in women with dense breasts. Within 4-5 minutes the background fibroglandular tissue can enhance to the same degree as a cancer making detection impossible. In the population high risk screening studies MRI consistently outperformed mammography and ultrasound especially in women under 50 years of age.

Multifocal or multicentric disease will be found in histological specimens in up to 20-50% of invasive cancers. A number of studies have demonstrated that MRI will detect additional disease (1-6) and does so with greater accuracy than mammography and ultrasound particularly in women with dense breast tissue. However whether MRI actually impacts on improved patient management by reducing the number of second operations by improving the accuracy of assessing disease extent, or reduces local recurrences and ultimately impacts on survival is not known. A Blue Cross and Blue Shield Association Medical Advisory Panel review published in 2004 concludes that there is insufficient evidence of patient benefit from using MR in staging the breast. The main concerns raised are the potential false positive rate of MRI and the need to biopsy any additional disease found with MRI before subjecting a patient to a mastectomy rather than breast conservation therapy (BCT) with radiotherapy. (7) The Blue Cross review of 18 studies with 1,401 patients found that between 2-15% of patients being considered for BCT might have a mastectomy as a result of multicentric disease found on MRI, with women with DCIS or invasive lobular cancer being most likely to have multicentric disease (20-28% and 17-40% respectively) (7). A more recent meta-analysis of pre-operative MRI found additional disease in 163 of patients. The conversion from wide local excision to mastectomy was 8.1% and from WLE to a wider excision 11.3%. In women in whom the additional was subsequently found to be benign there was a 1.1% increase mastectomy rate and 5.5% had wider excision (8).

The UK NICE guidance concluded that MRI was not indicated pre-operatively except where patients had dense breasts, the imaging findings were discordant or where the patient had an invasive lobular cancer (10). Lobular cancers have an infiltrative pattern which are more easily delineated on MRI than by mammography (11,12) and are more likely to be multi focal (13,14).

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