Barts Health NHS
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SHOULD BREAST DENSITY BE AN INDICATION FOR PRE-OPERATIVE BREAST MRI IN PATIENTS WITH PRIMARY BREAST MALIGNANCY?

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Background:

Most breast units follow strict guidelines regarding the use of MRI in primary breast malignancy. Some indications are widely accepted, however dense background breast parenchymal pattern is often overlooked as a true indication.

The EUSOMA working group 2010 highlighted and discussed the research behind a number of indications for the MRI. These include:

- staging before treatment planning
- screening of high-risk women
- evaluation of response to neoadjuvant chemotherapy
- patients with breast augmentation or reconstruction
- occult primary breast cancer
- breast cancer recurrence
- nipple discharge
- characterisation of equivocal findings at conventional imaging
- inflammatory breast cancer
- male breast

Breast density in not mentioned in the above list. However it is widely accepted that increased parenchyma density makes lesions more difficult to identify on conventional imaging, and that Breast MRI has consistently been found to detect additional unsuspected malignancy within the ipsilateral breast, with numerous studies identifying this in 10% to 27% of patients[3].

Aim:

Our aim therefore was to determine the number of patients in which MRI demonstrated further lesions undetected on conventional imaging, and if these rates were higher in women with dense breasts.

Methods:

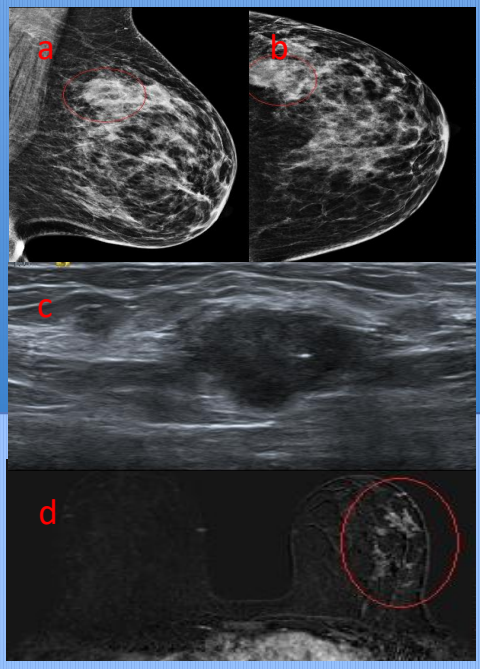
Record of all patients presenting to our unit during 2017 with a primary breast malignancy who underwent MRI. Breast parenchymal density graded on initial presenting mammogram. MRI reports reviewed to determine which studies led to further imaging and whether further pathology was identified.

Results:

In total, 434 primary breast cancers were diagnosed in our unit. Of these, 174 (40%) patients had an MRI as part of their diagnostic pathway. Following MRI, 63/174 (36%) patients required second look ultrasound. 21/63 subsequent studies were normal, patient therefore proceeded with surgery without MRI altering treatment plan.

In 42/63 patients (66.7%), further pathology was identified. 17/63 (27%) patients had further sites of malignancy. The majority of patients with further pathology identified on MRI had dense breasts (ACR 3 and 4); 12/17 (70.5%) of those with a further malignant lesion identified, and 20/25 (80%) of those with further benign lesion.

Imaging Example:



Images a & b demonstrate an ill-defined 27mm lesion within the upper outer quadrant of the left breast on standard mammographic views (density ACR grade 3). Image C demonstrates the same lesion measuring 25mm on ultrasound (US). US guided core biopsy confirmed a grade 2 intraductal carcinoma. Under standard guidelines this patient would not have undergone any further imaging at this stage. However due to breast density, an MRI study was performed.

Post contrast subtraction MRI (image d) demonstrates additional extensive non mass enhancement extending anteriorly from the lesion. Second look targeted ultrasound using MRI for guidance was able to demonstrate the presence of further disease which was histologically proven and increased total extent of pathology 60mm. This altered surgical management from breast conservation to mastectomy.

Conclusion:

MRI is an extremely useful tool in the diagnostic pathway of patients for surgical planning. Although density is not currently a strict criteria for pre-treatment MRI, our results suggest that careful consideration/increased utilisation of MRI should be made in those with increased breast density.

References:

1. Magnetic resonance imaging of the breast: Recommendations from the EUSOMA working group. Sardanelli et al 2010. EJC 46 2010
2. Clinical Indications for breast MRI. Argus et al. Applied Radiology online article
3. MRI Breast Clinical Indications: A Comprehensive Review. Walter M, Nadalo L. JOACR 2013 Vol2. Issue 1.