Breast MRI Biopsy : 7 Years Experience

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Introduction

MRI breast biopsy was introduced in Leeds in 2002. It forms a small part of the total MRI workload (2-3%).

Referrals from elsewhere in the region have recently increased.

Method

- We have performed a retrospective audit of all biopsies undertaken in Leeds since the inception of the service in April 2002 to January 2009.
- Size is a factor in considering suitability for MRI biopsy.
- As a general guide the following criteria are used:
  Mass >5mm Area of enhancement > 10mm
- Interpretation of MRI generates an MRI score which takes into consideration morphology and enhancement pattern.
- MRI biopsy results are correlated with MRI score, final histology and clinical outcome.

MRI Score

MRI 1 = normal
MRI 2 = benign
MRI 3 = indeterminate, probably benign
MRI 4 = suspicious
MRI 5 = malignant

Results

- 33 patients were recalled for MRI biopsy (6 from outside centres)
  - 25 for lesions in the symptomatic breast
  - 8 for lesions in the contra-lateral breast
- 15 were masses ranging from 3-30mm (median 12mm)
- 18 were areas enhancement ranging from 7-65mm

Summary of Lesion Classification by MRI and Correlation with Histology

MRI score	MRI biopsy result B1/2	B3	B4/5	Histology post surgery	Follow up cases	Failed biopsy
MRI 3 n=17	13	0	4	4 - B5a/b	11*	0
MRI 4 n=12	4	2	6	7 - B5a/b 3 - B3 radial scar	2	1 - biopsy B1 but B5b at excision
MRI 5 n=4	2	0	2	4 - B5a/b	0	2 - biopsy B2 but B5b at excision

*2 fibroadenomas were not removed or followed up as imaging concordant with benign histology

- Final malignant histology: 15 out of 33 (45% of cases)
  - invasive cancer 10
  - DCIS 5
- Correlation of MRI score with final histology:
  MRI 3 - 28% malignant, MRI 4 - 57% malignant, MRI 5 - 100% malignant

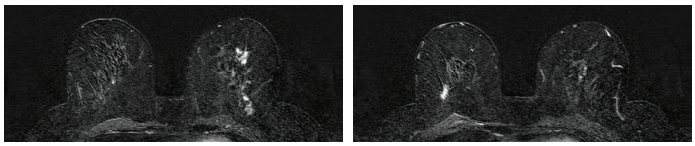
Failed Biopsies

- 3 failed biopsies - all recognised as non representative at time of procedure
- Posteriorly placed lesions caused technical difficulties
- All 3 lesions successfully removed at surgery and were malignant

Contralateral Lesions

- 8 Lesions were incidental MRI findings in the contralateral breast
- No malignant lesions were detected
- 5 were B1 on biopsy and followed up
- 2 were fibroadenomas
- 1 was B3 and surgically excised

Non Concordant Triple Assessment: MRI Confirmed Malignancy



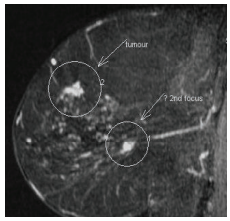
Fat suppressed contrast enhanced subtraction images.

NHSBSP detected bilateral lesions. Stereobiopsy left = high grade DCIS. Stereobiopsy right = B1. MRI for extent and to evaluate the lesion in the right breast. Biopsy revealed DCIS, confirmed on WLE.

MRI Biopsy Facilitated Breast Conservation

MIPP sagittal reconstructions of subtracted T1 post contrast images of the right breast.

Bilateral breast cancers detected on mammograms. MRI for tumour extent revealed a further lesion in right breast posterior to the tumour. MRI biopsy = radial scar. Both removed at WLE.



Follow Up

- 13 cases benign on biopsy were followed up either with mammography at 12 months or MRI at 4-12 months
  - 12 were all normal on follow up
  - 1 case lost to follow up

Discussion

Factors which influence the decision to biopsy

MRI score and the decision to proceed to biopsy is dependent on a number of variables

Factors which increase level of concern and RAISE score

- confirmed cancer in ipsilateral breast
- increased risk factors for developing cancer e.g. family history
- solitary enhancement with minimal background enhancement

Factors which decrease level of concern and LOWER score

- bilateral nodular enhancement
- incidental findings on MRI particularly in contra-lateral breast with normal 2nd look ultrasound

Suggested management plan for MRI detected lesions

MRI score	mass < 5mm enhancement < 10mm	mass > 5mm enhancement > 10mm
3	?	2nd look ultrasound + biopsy MRI biopsy MRI follow up
4/5	2nd look ultrasound +/-biopsy MRI follow up - 12 months - 6 months if family history	2nd look ultrasound +/-biopsy MRI biopsy Surgical excision

? Small, indeterminate lesions are problematic as they are generally too small to biopsy.

Consideration of clinical and imaging factors must be used to help upgrade or downgrade the lesion and avoiding excessively high rates of MRI follow up.

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