

What is the clinical impact of breast MRI ?

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Introduction: Breast MRI was introduced at our institution in 1994, initially as a research tool. Since 1998 it has been available for routine clinical use. In a previous study, we showed that pre-operative breast MRI does not influence the extent of surgical resection for breast conserving surgery¹. There have been very few other studies on the impact of breast MRI on patient outcome². In this study we evaluated the clinical impact of breast MRI in a wider context, that of patient management and outcome for all patients referred for breast MRI.

Methods: We analysed the indications, results and clinical impact of breast MRI reported by a single radiologist in our unit. All breast MRI scans performed over the last 2 years were reviewed. Data on clinical indications as well as scan reports were collected prospectively. An independent radiologist (not involved with the original reporting) and a breast surgeon jointly reviewed each patient data set. All positive findings on MRI were documented and the confidence level for each assigned (determinate or indeterminate). In order to determine the impact on clinical outcome, correlation with additional clinical and pathological data was made. Clinical impact was classified as positive (MRI result supported appropriate patient management), no impact (MRI result did not contribute to patient management), negative (MRI result led to inappropriate patient management) or unknown (incomplete follow-up data).

Results: A total of 105 breast MRI scans were analysed. Of these, 102 were successfully completed in a total of 85 patients. The primary clinical indication given for each scan was: suspected recurrence in 32 (31.4%), cancer follow-up in 18 (17.6%), staging in 8 (7.8%), assessment of response to chemotherapy in 7 (6.8%), suspected implant leak in 7 (6.8%), characterisation of breast mass in 5 (4.9%), detection of lesion within microcalcification in 4 (3.9%) and other in 20 (19.6%). The confidence level for each report was assigned as determinate in 68 (66.7%), indeterminate in 21 (20.6%) or both determinate and indeterminate in 13 (12.7%). The confidence level and clinical impact on patient outcome is summarised in the table below.

Table: MRI confidence level and impact on patient outcome for each clinical indication.

<i>Clinical Indications</i>	<i>Confidence Level (n=102)</i>			<i>Clinical Impact (n=75*)</i>		
	<i>Determinate</i>	<i>Determinate / Indeterminate</i>	<i>Indeterminate</i>	<i>Positive</i>	<i>No Impact</i>	<i>Negative</i>
Suspected recurrence	22	5	5	18	4	5
Cancer follow-up	15	1	3	11	2	3
Staging	5	3	1	1	1	0
Assessment of response to chemotherapy	4	0	3	5	0	0
Suspected implant leak	6	1	0	1	0	0
Characterization of breast mass	2	1	1	1	0	1
Detection of lesion within microcalcification	3	0	2	1	3	0
Other	11	2	6	12	3	3
Totals (%)	68 (66.7%)	13 (12.7%)	21 (20.6%)	50 (66.7%)	13 (17.3%)	12 (16.0%)

* 27 cases excluded due to incomplete follow-up data.

Conclusion:

Breast MRI has a positive impact, contributing to appropriate patient management and decision-making, particularly in breast cancer patients with suspected recurrence or in those undergoing MRI for routine follow-up for cancer. However, the detection of additional indeterminate lesions outside the primary area of clinical concern can lead to a negative clinical impact. This study helped identify areas of strength and weakness of breast MRI. Future efforts should focus on recognising and trying to reduce episodes where breast MRI adversely affects patient outcome.

References:

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2. Fischer U et al. Breast carcinoma: effect of pre-operative contrast-enhanced MR imaging on the therapeutic approach. *Radiology* 1999; 213:881-88.