



## SIGNIFICANCE OF MRI STAGING OVER CLINICAL STAGING FOR DECISION MAKING IN CARCINOMA OF BREAST

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### ABSTRACT

The purpose of this study is to determine influence of breast magnetic resonance imaging (MRI) in management of patients with breast cancer concerning surgical treatment and systemic therapy. This is a prospective analytical study carried out in 50 female patients with confirmed diagnosis of Carcinoma of Breast (proven by biopsy or FNAC). In all these patients correlation and analysis of clinical findings and MRI findings was done and changes in management plan was evaluated. In this study clinical staging of tumor was changed in total 20 patients (40%) after MRI. In 6 patients i.e. 12% cases detected with additional lesion on MRI. Out of which 3 lesions were detected in ipsilateral breast and 3 lesions detected in contralateral breast. In total 9 patients (18% cases) management plan was changed after MRI. MRI is effective in the management plan of breast malignancy & it is an important investigation in breast oncoplastic surgery in which the conservation of breast is priority with complete removal of malignancy but it is not possible in our set-up as we got a very small number of patients ideal for Breast oncoplastic surgery due to lack of awareness among people & late stage of presentation, poor compliance and low socio economic status of the patients.

**KEYWORDS :** MRI-STAGING, CARCINOMA OF BREAST, CLINICAL-STAGING

### INTRODUCTION

Breast cancer is the most common malignancy in women worldwide (25%) and in India (18.5%) it ranks second to cervical cancer but becoming most common cancer in most of the cities. In women Breast cancer is the second leading cause of cancer related deaths, second to lung cancer. The workup for newly discovered breast cancer has been changing over the last decade and increasingly includes the use of preoperative MRI for staging purposes. Magnetic resonance imaging (MRI) of the breast has high sensitivity (94 -100%)<sup>(1-3)</sup> The intent of using MRI is to detect synchronous, multifocal or multicentric lesions, estimating tumor extent, detecting contralateral diseases<sup>(4-7)</sup>. Planning of management of carcinoma breast is based on clinical examination, needle biopsy, mammography and detection of an additional lesion with breast MRI. The purpose of our study is to investigate the effect of preoperative MRI on the changes in management planning of the cases of carcinoma breast.

### MATERIAL AND METHOD

This is a prospective analytical study carried out in 50 female patients with confirmed diagnosis of Carcinoma of Breast (proven by biopsy or FNAC) in dept of surgery, Pt. J.N. Medical College & Associate Dr. B.R.A.M. Hospital, Raipur (C.G.) from January 2016 to September 2017. Sample was collected by simple random sampling method. All patients were clinically examined for clinical staging and plan of management. Then all these patients sent for MRI Breast. After collecting all Data we correlate and analyze our clinical findings and MRI reports regarding changes in decision making and management of Carcinoma Breast.

### Inclusion criteria-

1. Female pt presenting with diagnosed case of Carcinoma Breast (biopsy or FNAC proven) of all age group.
2. Patients who gave consent for the study.

### Exclusion criteria-

1. Patients who was not compatible with MRI (cardiac pacemaker, implanted neurostimulator, implanted hearing prosthesis, some models of brain aneurysmal clips, and some cardiac

prosthetic valve, and those suffering from claustrophobia might not be able to undergo the examination)

2. Patients who was unwilling to undergo study.
3. Benign breast diseases
4. Male carcinoma breast

The various parameters studied were compared using Chi square test to analyze the significance of difference of frequency distribution of data. The critical value of 'p' indicating the probability of significant difference was taken as <0.05 for comparison.

### ETHICAL AND SCIENTIFIC CLEARANCE-

Taken from ethical and scientific committee of Pt J N M Medical College and Associated Dr. B.R.A.M. Hospital Raipur.

### MR Imaging protocol-

All patients were examined using 3T magnetic resonance machine. All patients were examined in the prone position using dedicated breast coil. MRI was done within 7-14 days of menstrual cycle in premenopausal women. Examination included image acquisition followed by image post processing.

### Breast MR Image interpretation-

### BI-RADS: MRI; Breast Imaging Reporting and Data System for Magnetic Resonance Imaging-

### Assessments, Recommendation-

0. Incomplete, additional evaluation needed
1. Negative, no lesion found, routine follow up
2. Benign findings, routine follow up
3. Probably benign, short interval follow up
4. Suspicious abnormality
5. Highly suggestive of malignancy, take appropriate action (usually biopsy)
6. Known, biopsy proven malignancy

**DISCUSSION**

The study was conducted on 50 female patients who underwent their MRI for carcinoma of breast. Comparison between clinical staging and MRI staging and Management plan as per clinical assessment and as per MRI was done using chi square test. P value for this comparison is 0.00 which is clinically significant i.e. there is difference between the plans of management decided by clinical assessment and by MRI in this study. The proportion of additional lesions found with breast MRI in this study (12%) is considerably lower than has previously been reported<sup>18,9,10,11</sup>. The most reasonable explanation might be that breast MRI was offered to almost all women diagnosed with breast cancer and therefore performed in an unselected population<sup>12</sup>. In most of the studies there was conversion of previously planned BCS to MRM after preoperative MRI of breast in contrast to our study in which most of the patients were planned for MRM before MRI<sup>13</sup>. This is because in our setup most of the cases came with late presentation and also due to poor compliance, poor acceptance and low socioeconomic condition of the patients. In our study most of the management changes occur on those patient in which initially neoadjuvant chemotherapy was planned. In our study the change in management plan is lower than other studies and also lesser number of patients who undergo mastectomy of contralateral breast. The reason may be that fewer additional lesions were found in our study compared to the other centers and also because of small sample size in this study. **Bedrosian et al<sup>13</sup> 2003** studied Among 267 patients who were evaluated by MRI, MRI studies did not alter management in 198 patients (74%). However, in 69 patients, additional abnormalities were identified on MRI studies that led to either an additional biopsy or a more extensive surgical excision. Overall, 44 of 267 patients (16.5%) who were identified initially as suitable for breast conservation by conventional imaging studies and clinical examinations eventually led to mastectomy after MRI. 11 patients (4%) underwent a wider surgical excision than was planned initially; and 14 patients (5%) underwent an additional, separate excisional biopsy to evaluate the area of MRI-detected abnormality.

**RESULT**

**Staging as per clinical assessment-**

Most of patients presented with stage IIB (46% i.e. 23 out of 50) and stage IIIA (30% i.e. 15 cases out of 50) breast cancer. Others had stage IIA in 14%, stage IIIB in 8%, and only 2% had stage IA breast cancer on the basis of clinical examinations. As shows in table no.1

**Table No.1-**

Staging	Frequency	Percent
I	0	0
IIA	8	16.0
IIB	23	46.0
IIIA	15	30.0
IIIB	4	8.0
IIIC	0	0
IV	0	0
Total	50	100.0

**Staging of tumor as per MRI-**

Total 72% cases were of stage IIB, 16% cases were of stage IIIA, 6% cases were of stage IIA, 4% cases were of stage IIIB and 2% were of stage IV. As shows in table no.2

**Table no.2-**

Staging	Frequency	Percent
I	0	0
IIA	3	6.0
IIB	36	72.0
IIIA	8	16.0
IIIB	2	4.0
IIIC	0	0
IV	1	2.0
Total	50	100.0

**Additional lesion on MRI:**

Additional lesion was detected in MRI of 6 patients out of which 3 were present in ipsilateral breast and 3 were present in contralateral breast which was not detected clinically. Biopsy from the lesion was done from lesions in which 2 come to malignant and rests 4 were benign. As shows in table no.3

**Table no.3-**

Additional lesion	Frequency	Percent
SAME BREAST	3	6.0
CONTRALATERAL BREAST	3	6.0
NO CHANGE	44	88
Total	50	100.0

**Comparison between MRI staging and staging as per clinical assessment-**

In our study total 8 patients had presented with stage IIA as per clinical assessment & after MRI reporting staging of 5 patients were changed to stage IIB.

As per clinical assessment 23 patients had stage IIB disease, after MRI 3 patients were upstage to stage IIIA. Total 15 patients had stage IIIA on clinical assessment out

MRI STAGING	CLINICAL STAGING				
	IIA	IIB	IIIA	IIIB	
IIA	3	0	0	0	3
IIB	5	20	9	2	36
IIIA	0	3	5	0	8
IIIB	0	0	0	2	2
IV	0	0	1	0	1
TOTAL	8	23	15	4	50

of which 9 were staged as IIB after MRI and 1 patient changed to stage IV. As per clinical staging 4 patients had stage IIIB in which 2 were changed to stage IIB after MRI. So in total 20 patients (40%) MRI can alter the clinical staging of tumor.

Comparison between clinical staging and MRI staging was done using chi square test. P value for this comparison is 0.00 which is clinically significant i.e. there is significant difference between staging by clinical assessment and by MRI.

As shows in table no.4

**Table no.4-**

**Comparison between management plan as per clinical assessment and as per MRI-**

In our study total 41 patients out of 50 were planned for MRM as per clinical assessment. management plan was remain same in 37 patients after MRI also. Plan changed to neoadjuvant chemotherapy in 2 patients, in 1 patient to B/L MRM and in 1 patients changed to chemotherapy. In 1 patient BCS with axillary dissection was planned in clinical assessment which remain same after MRI. In 8 patients neoadjuvant chemotherapy was planned on clinical assessment in which 5 were Converted to MRM after MRI and 3 were also planned for neoadjuvant chemotherapy.

So in total 9 patients (18% cases) management plan was changed after MRI.

Comparison between management plan as per clinical assessment and as per MRI was done using chi square test. P value for this comparison is 0.00 which is clinically significant i.e. there is difference between the plan of management decided by clinical assessment and by MRI, As shows in table no.5.

Table no.5-

CLINIC MANAGEMENT	MRI MANAGEMENT					
	MRM	BCS with axillary dissection	NEOADJUVANT CHEMOTHERAPY	B/L MRM	CHEMOTHERAPY	
MRM	37	0	2	1	1	41
BCS with axillary dissection	0	1	0	0	0	1
NEOADJUVANT CHEMOTHERAPY	5	0	3	0	0	8
B/L MRM	0	0	0	0	0	0
CHEMOTHERAPY	0	0	0	0	0	0
<b>TOTAL</b>	<b>42</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>50</b>

### CONCLUSION

MRI alter the clinical staging of tumor in significant number of patients in this study and also detects additional lesions in same and contralateral breast although it is lower in our study, this may be due to smaller number of sample size or MRI done in unselected group of patients. Biopsy of MRI-identified lesions should be performed to avoid over-treatment. MRI is effective in the management plan of breast malignancy & its an important investigation in breast oncoplastic surgery in which the conservation of breast is priority with complete removal of malignancy but it is not possible in our set-up as we got a very small number of patients ideal for Breast oncoplastic surgery are due to lack of awareness among people & late stage of presentation, poor compliance and low socio economic status of the patients.

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