

Detection of Malignant lesion in Contralateral Breast in Newly Diagnosed Patients of Unilateral Carcinoma Breast on MRI

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ABSTRACT

Background: Women having unilateral breast cancer have added risk of contralateral breast cancer with an incidence of 1-5% synchronous cancer. There is also increased risk of metachronous cancer in contralateral breast. Female patients with bilateral breast cancer have grave prognosis in comparison to those with unilateral breast cancer. MRI breast is used to assess the multifocality and multicentricity of tumour.

Objective: To determine the diagnostic performance of MRI in detecting malignant lesion in contralateral breast in newly diagnosed patients of unilateral carcinoma breast.

Material and Methods: In this study total 150 newly diagnosed patients of unilateral breast cancer with normal mammographic and clinical examination of other breast were included. Study was conducted in Radiology department, Hayatabad Medical Complex Peshawar from Jan 2017 to March 2020. MRI scan of normal breast was done on a 1.5 Tesla magnet with multi-channel breast coil. For evaluating the breast lesions, administration of IV contrast and high spatial resolution is necessary. The malignant lesions of breast found on MRI were confirmed histo-pathologically.

Results: In 5 out of total 150 women included in study, MRI detected occult breast cancer in the opposite breast in whom clinical examination and mammography was normal (3.3%). 18 women (12.5 %) out of total 150 with positive findings on MRI underwent biopsy, and 5 specimens turned out to be carcinoma (27%).

Conclusion: MRI is very useful and helpful to detect occult malignancy in opposite breast which are not detected clinically or by mammography at the time of the initial diagnosis of carcinoma breast.

Keywords: Breast Magnetic Resonance Imaging, Mammography, Carcinoma

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INTRODUCTION

In most western and many Asian countries breast cancer is the most common and leading cause of cancer death. Women having unilateral breast cancer have added risk of contralateral breast cancer with an incidence of 1-5% synchronous cancer. There is also increased risk of metachronous cancer in contralateral breast having incidence of 3-13%¹. Female patients with bilateral breast cancer have grave prognosis in comparison to those with unilateral breast cancer. For this reason it is important to develop methods to detect synchronous malignant lesion in contralateral breast in newly diagnosed patients of breast cancer².

Sensitivity of screening mammography is less for women with dense breast³. Malignancy in opposite breast is detected in up to 10% of women with breast cancer who had negative findings on mammography and clinical examination of opposite breast initially⁴. Further if cancer in contralateral breast is diagnosed after first

treatment, a second round of chemotherapy has to be given to the patient⁵. The role of clinical examination of breast and mammography for diagnosing breast cancer is well established but there are some limitations as they can give false negative results⁶.

For better diagnosis of primary and recurrent malignant breast lesions dynamic contrast enhanced magnetic resonance (MR) imaging of the breast has important role in addition to ultrasonography and mammography⁷. Dynamic contrast enhanced MRI is also used to assess the effectiveness of cancer treatment. MRI breast is used to assess the multifocality and multicentricity of tumour. It differentiates postsurgical fibrosis from recurrent malignancy. It is a screening tool for high risk patients with BRCA1 positive gene⁸. Furthermore it is useful for breast implant assessment, metastatic disease with unknown primary⁹ and screening of opposite breast for occult cancer in patients diagnosed with primary breast carcinoma¹⁰. Studies have reported MRI sensitivity of 90% for detecting carcinoma breast¹¹.

We conducted this study to assess the diagnostic value of MRI breast in evaluating synchronous clinically and mammographically occult cancer in contralateral breast in patients with newly diagnosed unilateral breast cancer.

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MATERIAL AND METHODS

A cross sectional study was conducted in Radiology department, Hayatabad Medical Complex Peshawar from Jan 2017 to March 2020 after obtaining approval from hospital's ethical committee approval. Non- probability consecutive sampling technique was acquired.

Inclusion criteria: All patients with recently diagnosed breast cancer by histopathology and with normal clinical and mammographic findings of the contralateral breast. For our study breast cancer in contralateral breast was defined as malignancy identified in both breast at the same time or within 3months of diagnosis of primary breast lesion¹².

Exclusion criteria: Woman with contraindication for MRI, not recently diagnosed breast cancer, chemotherapy or hormonal therapy for breast cancer taken with 6 months before MRI.

In this study MRI of contra lateral breast was performed in total 150 of newly diagnosed patients of unilateral breast cancer with negative findings clinically and by mammography .The malignant lesions detected on MRI breast were confirmed histo-pathologically. Funding for the study was provided from research fund of department and hospital.

MRI breast was performed on Philips 1.5 tesla machine with multichannel breast coil, patient lying in prone position. After Scout images, axial and sagittal T2W with fat suppression, Sagittal T1 and Axial DWI of both breasts taken. Pre-contrast axial T1 with fat suppression, and Post-contrast axial dynamic multiphase T1 sequence with fat-

suppression of both breasts also taken.

The Radiologist reviewing the MRI Breast images has five years' experience in evaluation and interpretation of MRI and mammography images. The lesion in breast was categorized using BIRADS MR Lexican. Malignant lesion on MRI was defined as any lesion that has an irregular shape with spiculated margins, along with surrounding architectural distortion and shows ductal enhancement on post contrast images are considered malignant¹³. Statistical analysis was done using SPSS version 20.

RESULTS

During January 2017 to March 2020, 150 female patients with recently diagnosed unilateral breast cancer underwent MRI breast for contralateral breast synchronous cancer. Mean age of patients was 51 years. In 18 out of total 150 women (12%) included in study, MRI detected occult lesion in the opposite breast in whom clinical examination and mammography was normal. These 18 patients out of total 150 with positive findings on MRI underwent biopsy, and 5 specimens (27%) turned out to be carcinoma giving yield of 3.3%. 2 lesions categorized as benign on MRI turned out to be malignant on biopsy.

In our study sensitivity of MRI in detecting malignant lesion in contralateral breast was 71%, specificity of 90%, positive predictive value of 27% and negative predictive value of 98.4%.Histopathology results showed that of malignant lesions showed carcinoma in situ in 2(40%), invasive ductal carcinoma in 2(40%) and invasive lobular carcinoma in 1(20%).

Characteristics of Malignant Lesions in Contralateral Breast Cancer

MRI FEATURES	No. OF PATIENTS	PERCENT %
Size		
< 3 mm	1	20
3-5 mm	1	20
5-15 mm	2	40
>15 mm	1	20
Shape		
Rounded	1	20
Oval	1	20
Lobulated	1	20
Spiculated	2	40
Chest wall involvement	0	0
Lymph nodes	1	20

DISCUSSION

Breast lesions primarily detected by MRI are defined as the lesions not visible on ultrasound and mammography¹⁴. As conventional mammogram or ultrasound guided biopsy cannot be applied to the lesions, these lesions are hard to diagnose. Despite this there is evidence of presence of carcinoma in these lesions with reported rate of 2 to 51%¹⁵. In a study conducted by Uematsu et al there was malignancy rate of 39% in 74 MRI detected breast lesions¹⁶. This is comparable to carcinoma yield in our study which is 27%.

Assessment of opposite breast in patients with recent diagnosis of unilateral breast cancer is done by examination of breast clinically and conventional mammography currently. We evaluated in this study, the additional diagnostic accuracy of MRI in women with unilateral breast cancer. In total 150 newly diagnosed patients of carcinoma breast with negative findings clinically and by mammography, occult cancer in opposite breast was detected in 5 patients on MRI, with diagnostic yield of 3.3%, and sensitivity of 71% and specificity of 90%. These findings are similar to study by Lai et al² with diagnostic yield of 2.9%. This yield is higher compared to study by Lai et al for detection of synchronous contralateral breast carcinoma detected by conventional mammography and ultrasonography¹⁷.

In our current study specificity of MRI for detecting contralateral breast carcinoma is 90%. This is similar to study by Afzal et al¹⁸. This is higher than study Orel et al¹⁹, The reason being greater post MRI ultrasound correlation in our study. 2 cases in our study were false negative as lack of adequate enhancement of the lesion resulted in misinterpretation. Inadequate enhancement or misinterpretation of enhancing lesion can occur in Ductal carcinoma in situ and lobular carcinoma²⁰.

In our study, breast carcinoma detected by MRI only 1 patient was node positive, while four were node negative. The successful breast cancer screening programs is to detect early cancer, when there is no distant metastasis and disease has not involved lymph nodes. It is emphasized in recent studies to detect ductal carcinoma in situ, as it likely progresses to invasive cancer later on without treatment²¹. MRI positive cases of contralateral breast give additional benefit of

giving simultaneous cancer therapy to multiple tumors and so multiple round of cancer therapy can be avoided. This study shows that in patients with recent diagnosis of unilateral breast cancer, MRI is very beneficial to detect contralateral breast cancer along with clinical breast examination and mammography. False positive rate of MRI is 7% in our study. This data provides a firm base to take care in interpretation so that unnecessary contralateral mastectomies can be avoided²².

Limitation to our study include small sample size, not all contralateral benign looking breast could be biopsied and non-availability of MRI guided biopsy.

CONCLUSION

MRI is very useful and helpful to detect occult malignancy in opposite breast which are not detected clinically and by mammography at the time of the initial diagnosis of carcinoma breast. With the benefit of early diagnosis of carcinoma in contralateral breast by MRI simultaneous treatment of synchronous lesion can be provided rather than multiple treatments after initial therapy.

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