

Original Research Article

To assess role of dynamic contrast enhanced MRI in diagnosis and characterization of breast lesions

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Abstract:

Background & Method: The aim of present study is to assess role of dynamic contrast enhanced MRI in diagnosis and characterization of breast lesions. The procedure was explained to the patient and a written informed consent was taken from each patient prior to conducting the scan. Adequate pre-procedural counseling of the patient alleviated anxiety and ensured patient co-operation.

Result: The fourth decade formed the maximum no. of patients with 30% followed by the fifth decade with 24%. Right sided lesions are more common. Tumor involving >1 quadrant is common

Conclusion: The majority of patients presenting with breast lesions were fifth and sixth decades. Most common clinical presentation was lump in breast. Most common quadrant involve in breast was upper outer quadrant and lesions were more common in right breast. Therefore it must be used in conjunction with conventional modalities like ultrasonography and mammography to achieve maximum accuracy of early diagnosis and characterization of breast malignancy which helps in early appropriate intervention resulting in improved prognosis in breast cancers.

Keywords: MRI, diagnosis, characterization & breast lesions.

Study Designed: Observational Study.

1. INTRODUCTION

The breast develops in the pectoral region from the mammary lines which are ectodermal ridges extending from the axilla to groin. Initially a thickened mass of the ectodermal cell is formed in the pectoral region from this 16 -20 solid outgrowth arises and grow into the surrounding dermis[1]. The thickened masses of the epidermis as well as these outgrowths then get canalized to form the secretory elements.

The proximal end of each outgrowth forms the lactiferous tubules. The epidermis at the point of original development of the gland forms a small mammary pit into which lactiferous duct open[2]. Growth of the underlying mesoderm progressively pushes the wall of this pit outwards until it becomes elevated above the surface to form the nipple.

The mammary gland remains rudimentary in the male. In females the ducts and the secretary elements undergoes extensive development during puberty and pregnancy. The breast lies on the chest wall extending from the second rib cranially to the sixth rib caudally and from the midline of the sternum medially to the mid axillary line laterally[3]. Deep to the gland lays the pectoralis major muscle. The entire gland is contained within the superficial and deep layers of the superficial fascia of the pectoralis major[4].

The breast is composed of glandular tissue and is supported by the fibrous connective tissue and fat. The glandular tissue consist of the approximately 15 -20 lobes each connected to the particular lactiferous duct which dilates to form the lactiferous sinus just deep to the nipple[5]. The areola is pigmented area which surrounds the nipple and contains sebaceous gland and areolar gland (Montgomery) which are intermediate in structure between lactiferous and sweat gland.

2. MATERIAL & METHOD

This is a prospective study conducted at Index Medical College Hospital & Research Centre, Indore, M.P. from June 2019 to May 2020, 50 patients who presented at our hospital with the clinical diagnosis of breast lump. The study was approved by the Ethics Committee of the institution.

The procedure was explained to the patient and a written informed consent was taken from each patient prior to conducting the scan. Adequate pre-procedural counseling of the patient alleviated anxiety and ensured patient co-operation.

Inclusion Criterion:

1. Any patient presenting with lump, pain, fever, axillary lump, nipple discharge in breast and giving consent was included in the study.
2. Such 100 consecutive patient of breast lump was examined by Dynamic contrast enhanced MRI and was performed for each patient.

3. RESULTS

TABLE 1: AGE DISTRIBUTION OF CASES

S. No.	AGE (YEARS)	NO OF CASES	PERCENTAGE
1	0 – 9	00	0%
2	10 -19	02	2%
3	20-29	18	18%
4	30-39	16	16%
5	40-49	24	24%
6	50-59	30	30%
7	60-69	10	10%
	TOTAL	100	100%

The fourth decade formed the maximum no. of patients with 30% followed by the fifth decade with 24%.

TABLE 2: LOCATION OF TUMOR IN BREAST

S. No.	LOCATION (QUADRANT)	NO OF CASES	PERCENTAGE
1	CENTRAL	20	20%
2	UPPER OUTER	24	24%
3	LOWER OUTER	10	10%
4	UPPER INNER	02	2%
5	LOWER INNER	10	10%
6	> ONE QUADRANT	34	34%
	TOTAL	100	100%

Right sided lesions are more common. Tumor involving >1 quadrant is common

TABLE 3: MRI CHARACTERISTICS

S. No.	CHARACTERISTIC	VARIABLES	No. OF CASES	% OF CASES
1.	MARGINS	(1)REGULAR	38	38%
		(2)IRREGULAR	62	62%
2.	SPICULATIONS	(1)PRESENT	56	56%
		(2)ABSENT	44	44%
3.	PECTORALIS INVOLVEMENT	(1)PRESENT	16	16%
		(2)ABSENT	84	84%
4.	SKIN INVOLVEMENT	(1)PRESENT	16	16%
		(2)ABSENT	84	84%
5.	NIPPLE RETRACTION	(1)PRESENT	14	14%
		(2)ABSENT	36	36%
6.	AXILLARY NODES	(1)PRESENT	20	20%
		(2)ABSENT	80	80%

TABLE 4: DYNAMIC CURVE CHARACTERISTICS

TYPE	BENIGN	MALIGNANT	TOTAL
NO ENHANCEMENT	04	00	04
I	16	06	22
II	08	32	40
III	02	32	34
TOTAL	30	70	100

4. DISCUSSION

The use of breast MRI for cancer detection has changed our algorithms in the detection and treatment of breast cancer, by being able to detect cancer in early stage that is occult on conventional imaging methods, such as mammography and sonography, it is

encouraging to know that early detection of breast cancer allows early surgical intervention and makes disease curable and prolongs the survival.

In the present study, the most common age group of patients presenting with breast lesions was in the 50-59 years range constituting 30% of the cases followed by 40-49 years with 24% of cases, this was similar to the observation in study by Linda White Nunes et al[6].

In our study, majority of the patients presented with unilateral involvement of the right breast in 48% of cases followed by left breast involvement seen in 36% of cases and bilateral breast involvement in 16% of cases. The most common quadrant involved was upper outer followed by more than one quadrant involvement[7].

On MRI out of 50 patients 36 were reported to have mass like lesion constituting 72% of total cases and 13 were reported as non mass lesions accounting for 26% and remaining 2 that is 4% were non enhancing lesions[8].

Morphological features, enhancement patterns and enhancement kinetics are taken into consideration for interpreting breast MRI lesions[9]. Enhancement patterns are broadly divided into two subgroups, mass like and non-mass like. Among the mass like lesions, out of 36 cases 26 were diagnosed as malignant and on HPE 21 were malignant resulting into false positive in 5 patients. Benign diagnosis was made in 10 cases and on HPE among them 9 were benign resulting in to 1 false negative. In our study with considering morphological features alone mass like lesions with malignancy were diagnosed with accuracy of 80% [10].

5. CONCLUSION

The majority of patients presenting with breast lesions were fifth and sixth decades. Most common clinical presentation was lump in breast. Most common quadrant involve in breast was upper outer quadrant and lesions were more common in right breast. Therefore it must be used in conjunction with conventional modalities like ultrasonography and mammography to achieve maximum accuracy of early diagnosis and characterization of breast malignancy which helps in early appropriate intervention resulting in improved prognosis in breast cancers.

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