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Original Research Article

To determine the best diagnostic modality for symptomatic breast lesions based on triple assessment

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Abstract

Background & Methods: The aim of the study is to determine the best diagnostic modality for symptomatic breast lesions based on triple assessment. FNAC was performed according to our standard protocol for symptomatic patients, which does not include image guidance. The results of the clinical examination were graded as P1, normal; P2, benign; P3, probably benign; P4, probably malignant; and P5, malignant. A classification of P4/5 was taken as positive for the diagnosis of malignancy. Ultrasound was performed by specialist breast radiologists. DCE-MRI of the breast was then arranged.

Results: Mean age of 43 years (range 15 to 78 years) were recruited, Triple assessment MRI and FNAC all have specificity of 100% .specificity of USG and physical examination is 94% and 92.3% respectively. MRI proved to be most sensitive modality with 95 % sensitivity, (physical examination 91%, USG 92%, FNAC 86% and Triple assessment 87%)

Conclusion: With the aim of improving the accuracy of triple assessment, MRI can provide valuable information and with improvements in technology (dynamic contrast fast sequence MRI) can further enhance specificity. Contrast-enhanced dynamic magnetic resonance imaging of the breast is as sensitive and more specific than the combined traditional triple assessment for the diagnosis of malignant breast lesions.

Keywords: modality, breast, lesions & assessment.
Study Design: Observational Study.

1. Introduction

Breast cancer is one of the most important diseases for women worldwide and constitutes one fourth of all cancers in females, making it the most common cancer in females .Breast cancer is 100 times less common in men[1].

Breast cancer accounts for approximately 15% of female cancer deaths. It is the leading cause of death in women aged 44-50 years[2]. The incidence of breast cancer increased during the 1980s but leveled off in the 1990s and declined between 2001 and 2003. Worldwide, the incidence of breast cancer is highest in developed countries in North America and Western Europe, with lowest incidences seen in South America, Africa and parts of Asia[3].

The 5-year breast cancer survival rate ranges from 98% for stage I cancer to approximately 16% for stage IV cancer[4]. Death rates from breast cancer have steadily declined since the early 1990s, with the largest decreases among younger women.

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Breast cancer evaluation should be approached with an ordered inquiry beginning with symptoms and general clinical history, followed by clinical examination and, finally, investigation, which may include imaging and biopsy[5]. This approach naturally lends itself to a gradually increasing degree of invasiveness, so that when a diagnosis is obtained, the process can be stopped with the minimum amount of invasion and, consequently, minimum discomfort to the patient. Because the more invasive investigations also tend to be the most expensive, this approach is usually the most economical.

2. Material and Methods

Present study was conducted at Index Medical College Hospital & Research Centre, Indore, M.P. for 01 year. Patients with palpable breast lesions were recruited from the symptomatic breast clinics. All underwent clinical examination by consultant breast surgeons,

FNAC was performed according to our standard protocol for symptomatic patients, which does not include image guidance.

The results of the clinical examination were graded as P1, normal; P2, benign; P3, probably benign; P4, probably malignant; and P5, malignant. A classification of P4/5 was taken as positive for the diagnosis of malignancy. Ultrasound was performed by specialist breast radiologists. DCE-MRI of the breast was then arranged. The resulting films were classified as no abnormality, benign, indeterminate/suspicious, or malignant. The classification of suspicious or malignant was taken as positive.

3. Result

Table No. 1: Age Distribution

S. No.	Age	No.
1	15-30	21
2	31-50	47
3	51-70	29
4	More than 70	23

Mean age of 43 years (range 15 to 78 years) were recruited

Table No. 2: Benign / Malignant

S. No.	Benign / Malignant	No.
1	**Benign**	21
2	**Malignant**	99

Out of 120 patients 99 with clear evidence of malignancy were excluded from study and rest 21 were subjected to MRI.

Table No. 3: Histologic Diagnosis of Excised Llesions

S. No.	Benign / Malignant	No.
	Benign	
1	Invasive ductal	05
2	Invasive lobular	07
3	Invasive ductal & DCIS	01
4	Invasive lobular & DCIS	02

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5	Tubular & DCIS	03
6	DCIS	01
7	DCIS & LCIS mixed	01
8	Other	01
	Malignant	
1	Fibroadenoma	31
2	Fibrocystic disease	28
3	Duct ectasia	09
4	Radial scar	07
5	Involutional changes	08
6	Scarring	04
7	Juvenile papillomatosis	06
8	Intraductal papilloma	02
9	Abscess	03
10	Other	01

Table No. 4: Assessment

1	**Specificity**	**sensitivity**
Physical examination	92.3%	91%
USG	94%	92%
FNAC	100%	86%
MRI	100%	95%
TRIPLE ASSESSMENT	100%	87%

Triple assessment MRI and FNAC all have specificity of 100% .specificity of USG and physical examination is 94% and 92.3% respectively. MRI proved to be most sensitive modality with 95 % sensitivity, (physical examination 91%, USG 92%, FNAC 86% and Triple assessment 87%)

4. Discussion

Triple assessment with clinical, cytologic, and mammographic investigations has become established as the gold standard for the diagnosis of malignant breast lesions. It is generally accepted that >95% of palpable malignant breast lesions can be diagnosed in this way. (Merion Thomas J et al.)[6]

However, the specificity of this method of diagnosis continues to give rise to concerns that false-positive results will lead to both psychological and physical problems. Attempts at improving the accuracy of triple assessment have focused principally on three areas: scoring systems, core needle biopsy, and improvements in the quality of imaging[7]. There is little doubt that improving the objectivity of triple assessment with a suitable scoring system would increase its overall accuracy. Using core needle biopsy to obtain a histologic rather than a cytologic result, although it has produced some promising early results, has not resulted in a marked diagnostic improvement over traditional FNAC. This accepted, the use

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of image-guided FNAC and core techniques has been shown to reduce costs considerably compared with open biopsy[8]. Digital mammography can provide significantly more information than traditional film/screen mammography, but the essential method of imaging remains the same, with the principal improvement being in contrast resolution and the ability to manipulate and analyze the image; however, spatial resolution remains a technological limitation when compared with film/screen mammography[9].

Dynamic contrast-enhanced MRI relies on fundamentally different methods of image acquisition and processing than x-ray mammography. Mammography relies on tissue density; contrast-enhanced MRI is dependent on tumor vascularity and permeability[10]. This gives it a theoretical advantage to identify breast lesions and to distinguish benign from malignant disease. Dimeglumine gadopentetate (Gd-DTPA), the contrast agent most commonly used, was first applied to breast imaging in the 1980s. However, in these early scans it was found that although excellent sensitivity was obtained, the specificity was poor because both benign and malignant lesions enhanced on postcontrast images.

5. Conclusion

With the aim of improving the accuracy of triple assessment, MRI can provide valuable information and with improvements in technology (dynamic contrast fast sequence MRI) can further enhance specificity. Contrast-enhanced dynamic magnetic resonance imaging of the breast is as sensitive and more specific than the combined traditional triple assessment for the diagnosis of malignant breast lesions.

6. References

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