

## Original Research Article

## Significance of Masood's Scoring Index in Cytological Diagnosis of Palpable Breast Lumps: A 3 Years Restrospective Studies

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### Abstract

*Introduction:* Breast lump is the commonest presentation of breast diseases. Diagnosis of breast diseases can be made out based on history, physical examination and investigations, like cytology, histology and radiology. Several studies have shown that triple tests consisting of clinical, cytopathological and radiological examinations are more accurate, when all the three are positive; the accuracy approaches almost 100% for malignancy. *Materials and methods:* A 3 years retrospective study was performed in the Department of Pathology in a tertiary care centre. The cytological slides and corresponding histological slides were retrieved from the archives, and the cytological smears of palpable breasts were assessed. *Statistical analysis:* concordance study between conventional, MMSI and comparison with Histopathology. *Results:* A total 226 patients with palpable breast lump were included in the study. A total of 18 cases were diagnosed by histopathology and there was 100% correlation between conventional and post MMSI diagnosis. A total of 144 cases were diagnosed in this category by histopathology 134 (94.4%), cases showed correlation, whereas 2 (1.4%) were under diagnosed as non proliferative breast diseases and 6 (4.2%) were over diagnosed as carcinoma by conventional cytology. Proliferative breast diseases with atypia. Out of 6 cases diagnosed on histopathology, MMSI showed 100% correlation, whereas conventional cytology 2 cases were under diagnosed as category 2 and 2 cases were correctly categorized as category 3, and 2 cases were over diagnosed as category 4. Carcinoma in situ/ Carcinoma. Out of 58 cases diagnosed by histopathology, 52 (89.7%) showed correlation with MMSI and conventional smears. 6 (10.3%) cases were under diagnosed and categorized as category 3 by MMSI. 4 cases (6.9%) were under diagnosed and categorized as category 2 and 2 cases (3.4%) were under diagnosed and categorized to category 1 by conventional cytology. *Conclusion:* The present study concludes that Masood's modified scoring index has better diagnostic accuracy than conventional cytology method in diagnosing proliferative breast diseases without atypia and proliferative breast diseases with atypia, which is very useful in management of patients.

**Keywords:** Breast Carcinoma; Fine Needle Aspiration Cytology; Tumor Grading; Proliferative Breast Diseases; Atypia.

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## Introduction

Breast lump is the commonest presentation of breast diseases. Diagnosis of breast diseases can be made out based on history, physical examination and investigations, like cytology, histology and radiology. Several studies have shown that triple tests consisting of clinical, cytopathological and radiological examinations are more accurate, when all the three are positive; the accuracy approaches almost 100% for malignancy [1-4].

Breast cancer is the most common cancer in women in India, second only to cervical cancer as high as 25.8 per one lakh women [5]. Incidence of breast carcinoma is increased by 11.54% and mortality is increased by 13.82%, in spite of all the workup [6].

Fine Needle Aspiration Cytology (FNAC) has been well documented in diagnosis of breast lesions and accuracy of diagnosis by FNAC determines the clinical outcome and further management. Instead of usual descriptive method of reporting FNAC smears, cytological grading systems, adds to the objectivity, reproducibility and authenticity of particular report [7-10]. Masood et al, proposed a scoring system with an aim to sub group breast

lesions called Masood's Scoring Index (MSI) [11]. Subsequently Nandini et al, modified the original MSI to improve the diagnostic accuracy and introduced a Modified Masood's Scoring Index (MMSI) by shifting non-proliferative breast diseases from 6 -10 to 6-8 and shift of score 9-10 to proliferative breast diseases without atypia [12-13].

The nuclear cytological grading system consists of various components like cellular arrangement, cellular pleomorphism, myoepithelial cells, anisonucleosis, nucleoli and chromatin clumping. Each is given a score as mentioned in Table 1.

*Aim:* To asses the significance of cytological scores system over conventional cytology.

## Material and Methods

A 3 years retrospective study was performed in the Department of Pathology in a tertiary care center. The cytological slides and corresponding histological slides were retrieved from the archives, and the cytological smears of palpable breasts were assessed by two independent observers who were blinded to the conventional FNAC diagnosis. The slides were assessed and were grouped into 4 categories using MMSI (Table 2).

**Table 1:** Modified Masood's scoring index

Cellular arrangement	Cellular Pleomorphism	Myoepithelial cells	Anisonucleosis	Nucleoli	Chromatinclumping	Score
Monolayer	Absent	abundant	Absent	Absent	Absent	1
Nuclear overlapping	Mild	Moderate	Mild	Micronucleoli	Rear	2
Clustering	Moderate	Few	Moderate	Micronucleoli or rare Macronucleoli	Occasional	3
Loss of cohesion	Conspicuous	Absent	Conspicuous	Predominantly Macronucleoli	Frequent	4
Non Proliferative breast disease - 6 - 8						
Proliferative breast disease without atypia - 9 - 14						
Proliferative breast disease with atypia - 15 - 18						
Carcinoma in situ/ carcinoma - 19 - 24						

**Table 2:**

Category	Lesions Included
1 Non Proliferative breast disease	Fibrosis Cysts Adenosis Duct Ectasia Benign lumps
2 Proliferative breast disease without atypia	Ductal Hyperplasia without atypia Fibroadenoma Begine Phylloids Sclerosing Adenosis Papillomatousis
3 Proliferative breast disease with atypia	Atypical Ductal Hyperplasia Atypical Lobular Hyperplasia
4 Carcinoma in situ/carcinoma	Carcinoma in situ (all types) Carcinoma (all types)

**Table 3:** Histopathology VS Conventional Cytology

			Cytology				Total
			1	2	3	4	
Histopath	1	Count	18	00	00	00	18
		% with Histo	100%	0.0%	0.0%	0.0%	
	2	Count	2	136	00	06	144
		% with Histo	1.4%	94.4%	0.0%	4.2%	100%
	3	Count	00	2	2	2	6
		% with Histo	0.0%	33.3%	33.3%	33.3%	100%
	4	Count	2	4	00	52	58
		% with Histo	3.4%	6.9%	0.0%	89.7%	100%
Total% with Histo		Count	22	142	2	60	226
			9.7%	62.8%	.09%	26.5%	100%

**Table 4:** Histopathology VS MMSI

			MMSI				Total
			1	2	3	4	
Histopath	1	Count	18	00	00	00	18
		% with Histo	100%	0.0%	0.0%	0.0%	
	2	Count	2	140	02	00	144
		% with Histo	1.4%	97.2%	1.4%	0.0%	100%
	3	Count	00	0	6	0	6
		% with Histo	0.0%	0.0%	100%	0.0%	100%
	4	Count	0	0	6	52	58
		% with Histo	0.0%	0.0%	10.3%	89.7%	100%
Total% with Histo		Count	20	140	14	52	226
			8.8%	61.9%	6.2%	23.0%	100%

The histopathological diagnosis of the respective cases was also sub grouped into 4 categories (Table 3).

All inadequate FNAC smears and for which the corresponding histopathological diagnosis were not available were excluded from the study.

Concordance analysis between conventional cytological diagnoses and post applications of MMSI with histopathological diagnosis was performed and analyzed (Table 4).

## Results

A total 226 patients with palpable breast lump were included in the study.

Post conventional and post MMSI diagnosis were classified into four categories as:

### 1. Non Proliferative Breast Diseases.

A total of 18 cases were diagnosed by histopathology and there was 100% correlation between conventional and post MMSI diagnosis.

### 2. Proliferative breast diseases without atypia.

A total of 144 cases were diagnosed in this category by histopathology 134(94.4%), cases showed correlation whereas 2(1.4%) were under diagnosed as non-proliferative breast diseases and 6(4.2%) were over diagnosed as carcinoma by conventional cytology.

140(97.2%) cases showed correlation with histopathology by MMSI. 2 cases (1.4%) were misdiagnosed as non-proliferative breast diseases and 2 cases (1.4%) were diagnosed as proliferative breast diseases with atypia by MMSI.

Out of 6 cases that were diagnosed as category 4 by conventional cytology, 2 were reassigned as category 2 and 3 by MMSI.

3. Proliferative breast diseases with atypia. Out of 6 cases diagnosed on histopathology, MMSI showed 100% correlation, whereas conventional cytology 2 cases were under diagnosed as category 2 and 2 cases were correctly categorized as category 3 and 2 cases were over diagnosed as category 4.

4. Carcinoma in situ/ Carcinoma. Out of 58 cases diagnosed by histopathology, 52(89.7%) showed correlation with MMSI and conventional smears.

6 (10.3%) cases were under diagnosed and categorized as category 3 by MMSI. 4 cases (6.9%) were under diagnosed and categorized as category 2 and 2 cases (3.4%) were under diagnosed and categorized to category 1 by conventional cytology.

Overall diagnostic accuracy of breast lesions increased by applying MMSI over conventional cytology by 94.4% to 97.2% in category 2 and 33.3% to 100% in category 3. Both category 1 and 4 showed no significant difference.

### Discussion

The study was undertaken to determine whether the defined cytological criteria used in MMSI would be more effective than conventional method of cytological reporting. In our study 18 cases were diagnosed as category 1 by conventional method and MMSI method and showed 100% correlation with histopathological diagnosis. This is important to distinguish between category 1 and 2 as management of patient varies significantly. Non-proliferative breast lesions are usually picked up by conventional cytology as atypia and abundance of bare nuclei. Category 2, out of 144 cases, we got 8 discrepant results (94.4%) by conventional smears, whereas accuracy increased to 97.2% by applying MMSI. Category 3 showed higher statistical concordance of 100% with MMSI with only 33% by conventional method.

Category 4, out of 58 cases, 6 cases were categorized into proliferative breast disease with atypia category 3 (89.7%) by MMSI. 89.7 cases diagnosed as category 4 (6.9%) were categorized as 2 and 3.8% as category 1.

By applying a scoring system the accuracy of cytological diagnosis improves.

### Limitations

Fewer number of category 3 cases as compared to other category and future studies with more numbers in this category would help.

### Conclusion

The present study concludes that Masood's modified scoring index has better diagnostic accuracy than conventional cytology method in diagnosing proliferative breast diseases without atypia and proliferative breast diseases with atypia, which is very useful in management of patients.

### Reference

1. Madubogwucl, Ukahco, Anyamwusn, Onyiaorah GC, Anyiam DC. Subclassification of breast aspiration cytology. *European journal of breast health*. 2017 Oct;13(14):194.
2. Takiar R, Srivastav A. Time trend in breast and cervical cancer of women in India-(1990- 2003). *Asian Pac j Cancer Prev APJCP*. 2008;9(4):777-80.
3. Zagorianakou P, Fiaccavento S, Zagorianakou N, Makrydimas G, Stefanu D, Agnantis NJ. FNAC: its role, limitations and prespective in the diagnosis of breast cancer. *Eur J GynaecolOncol*. 2005;26(2): 143-49.
4. Kafman Z, Sjpitz B, Shapiro M, Rona R, Lew S, Dinbar A. Triple approach in the diagnosis of dominant breast mass; combined physical examination, mammography and fine needle aspiration. *J Surg Oncol*. 1994;56(4):254-57.
5. Shreshtha Malvia, Sarangiadharan Appalaraju Bagadi, Uma S Dubey and Sunita Sexena. Epidemiology of breast cancer in Indian women: *Asia pacific journal of clinical oncology* 2017;13 289-95.
6. Bansal C, Pujani M, Sharma KL, Srivastava AN, Singh US. Grading system in the cytological diagnosis of breast cancer: a review. *Journal of cancer research and therapeutics*. 2014 Oct 1; 10(4):839.
7. Dziura BR, Bonfiglio TA. Needle cytology of breast. A Quantitative and qualitative study of the cells of benign and malignant ductal neoplasia. *Actacytol*. 1979;23(4):332-40.
8. Page DL, Dupont WD, Rados MS, Atpical hyperplastic lesions of the female breast. A long term follow-up study. *Cancer* 1985; 55(11):2698-708.
9. Mrihda AR, Iyer VK, Kapila K, Werma K. Value of scoring system in classification of proliferative breast disease on the fine needle aspiration cytology. *Indian J Patho Microbial*. 2006;49(3):334-40.
10. Frost AR, Tabbara SO, Poprockyla, Weissshsidawy MK. Cytologic features of proliferative breast disease: A study designed to minimize sampling error. *Cancer*. 2000;90(1):33-40.
11. Masood S, Frykberg ER, Mcllellan GL, Dee S, Bullard JB. Cytological differentiation between proliferative and non-proliferative breast diseases in mammographically guided fine needle aspirations. *DiagnCytopathol* 1991;7:581-90.
12. TS Rekha, NM Nandini. Evolution of breast neoplastic lesion by different cytology grading methods of science journal of clinical medicine 2015;(4-1):26-30.
13. Nandini NM, Rekha TS, Manjunath GV. Evaluation of scoring system in cytological diagnosis and management of breast lesions with review of literature. *Indian J cancer*. 2011;48(2):240-45.