

Diagnostic pitfalls in fine needle aspiration of breast lumps- a HIMS experience

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Received: 24-04-2021 / Revised: 02-06-2021 / Accepted: 05-07-2021

Abstract

Introduction: Breast cancer is one of the most common cancers in women. Fine Needle Aspiration Cytology (FNAC) is a crucial part of the 'triple approach,' which is extensively used to diagnose breast abnormalities prior to surgery. The FNAC technique has a number of advantages, including rapid diagnosis, high acceptance, cost effectiveness, high sensitivity and specificity, the ability to sample multiple areas at once, preoperative planning, sampling of metastatic as well as primary sites, performance of ancillary techniques, and quick psychological relief for the patient after a negative diagnosis. **Objectives:** To examine the sensitivity, specificity and diagnostic accuracy of FNAC of breast lumps by cytohistopathological correlation. To identify discrepancies in FNAC that lead to false diagnosis. **Materials and methods:** The present study will be conducted in Central Laboratory, Dept Of Pathology, HIMS Hassan. A total of 100 samples will be used for the present study from July 2020 to May 2021. Inclusion criteria: All females with clinically palpable breast lumps were included in the study. Exclusion criteria: Autolysed/necrosed tissue specimen, Inadequate cellularity of cytology and inadequate biopsy were excluded from the study. **Conclusions:** Fine needle aspiration cytology can be used to diagnose breast masses since it is a simple, cost-effective, highly accurate, rapid, and somewhat painless treatment. It's unavoidable to get some erroneous negative outcomes. However, there are a few diagnostic pitfalls to be aware of, and cytology diagnosis should be approached with carefully. The gold standard for evaluating breast lesions is histopathological investigation.

Keywords: Breast, cytology, FNAC, pitfall, benign, malignant

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Introduction

Breast cancer is one of the most common cancers in women. Fine Needle Aspiration Cytology (FNAC) is a crucial part of the 'triple approach,' which is extensively used to diagnose breast abnormalities prior to surgery [1,2]. Fine Needle Aspiration Cytology (FNAC) has recently played an essential role in the early detection of breast masses. Martin and Ellis were the first to describe fine needle aspiration cytology in the year 1930. Because it generates low morbidity and is visually least disfiguring, FNAC is a straight forward, cost-effective surgery with a high patient acceptability rate [3]. The majority of breast lumps are benign, but it can be difficult to tell whether a suspicious lump is benign or malignant merely by looking at it. FNAC, being a generally known and proven outside patient method, plays an essential role in determining the type of the lump in these conditions. The amount of open breast biopsies can be reduced using FNAC [4,5]. In certain situations, however, diagnosis by fine needle aspiration cytology may be presumptive. In such circumstances, the definitive diagnosis is made by histological study of the surgically excised tissue. The FNAC technique has a number of advantages, including rapid diagnosis, high acceptance, cost effectiveness, high sensitivity and specificity, the ability to sample multiple areas at once, preoperative planning, sampling of metastatic as well as primary sites, performance of ancillary techniques, and quick psychological relief for the patient after a negative diagnosis [3].

Objectives:

To examine the sensitivity, specificity and diagnostic accuracy of FNAC of breast lumps by cytohistopathological correlation.

To identify discrepancies in FNAC that lead to false diagnosis

Materials

The present study will be conducted in Central Laboratory, Dept Of Pathology, HIMS Hassan. A total of 100 samples will be used for the present study from July 2020 to May 2021.

Inclusion criteria: All females with clinically palpable breast lumps were included in the study

Exclusion criteria

Autolysed/necrosed tissue specimen, Inadequate cellularity of cytology and inadequate biopsy were excluded from the study.

Results

The spectrum of breast lesions on cytomorphological interpretation was 33 % benign, 54% cases 54%, 3 percent suspicious for malignancy, one case was atypical ductal hyperplasia and 9% were inflammatory lesions, among inflammatory lesions 7 cases were non specific inflammatory lesions & 2 were granulomatous mastitis (? Koch's) in 100 female patients presenting with breast mass. There were 5 cases of unsatisfactory or inadequate to opinion which are excluded from this study.

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Table 1: Case classification based on cytological diagnosis

Sl no	Cytological diagnosis	Percentage
1	Benign	33
2	Atypical Ductal Hyperplasia	01
3	Malignant	54
4	Suspicious for malignancy	03
5	Inflammatory lesions	09

In our the benign lesions were more prevalent in those between the ages of 21 and 30. Invasive ductal carcinoma was the most prevalent malignant lesion in the 3th to 6th decades of life, with invasive ductal carcinoma being the most prevalent cytologically (Table 1). In the current investigation, there was discrepancy in cyto-histopathological correlation in 05 instances. Two patients were given suspicious for malignancy in cytological diagnosis but were revealed to be malignant on histological analysis. On FNAC one case was diagnosed as Atypical ductal hyperplasia whereas on histopathology it revealed as Invasive ductal carcinoma. Two cases were diagnosed as Invasive Ductal Carcinoma on FNAC, one case was turned out to be metaplastic carcinoma and other turned out to be Invasive Ductal Carcinoma with medullary features (Table 2).

Table 2: Discordant cases are diagnosed cytologically and histopathologically.

SL no	FNAC diagnosis	Histopathological diagnosis
1	Suspicious for malignancy : 2 cases	Invasive ductal carcinoma
2	Atypical Ductal Hyperplasia : 1 case	Invasive ductal carcinoma
3	Invasive ductal carcinoma : 1 case	Metaplastic carcinoma
4	Invasive ductal carcinoma: 1 case	Invasive ductal carcinoma with medullary features

The sensitivity and specificity of the present study was 97% and 100% respectively (Table 3)

Table 3: Sensitivity & specificity of our study

		FNAC		
		Benign	Malignant	
Histopathology	Benign	0	0	0
		0%	0%	0%
		0%	0%	0%
	Malignant	3	97	100
		3%	97%	100%
		100%	100%	100%
	Total	3	97	100
Sensitivity : 97.0%				
Specificity: 100%				

Discussion

FNAC is a powerful, cost-effective, relevant, and dependable tool. a technique for detecting breast lesions with a high risk of cancer malignancy sensitivity and specificity. The current study is similar to a number of other research that have been conducted. The majority of patients who have breast lumps feel anxious. As a result, FNAC is particularly effective in minimizing anxiety and unneeded surgical operations, as well as in minimizing diagnostic delay. The FNA technique is a safe technique with just a few recorded side effects. The FNA technique is a safe technique with just a few recorded side effects. The incidence of tumor transplanting along the needle track by FNA method has been documented in the literature to be around 0.0045 percent, and much lower in superficially placed tumors [2,6]. In the present study, the percentage of malignant lesions (54%) on cytology was more than benign ones (46%) which are slightly higher than study done by Egwuonwu et al [16] and Mayun et al [17] who reported 47.3% and 40% malignant lesions in their study patients, respectively [7-9]. On cytology, an invasive ductal carcinoma was misdiagnosed as atypical ductal hyperplasia, resulting in false negative. Because of the overlapping appearances, the distinction between atypical ductal hyperplasia and invasive ductal carcinoma is exceedingly small [3]. Both lesions have cell-rich smears of cohesive sheets and clumps of epithelial cells with atypia,

as well as necrotic debris. Nuclear atypia, loss of epithelial cell cohesion, necrosis, and the lack of myoepithelial cells and solitary bipolar nuclei all point to malignancy in lesions with epithelial hyperplasia [10]. It is always important to excise those lesions which are considered atypical on FNAC because the morphologic features of well differentiated, invasive and in situ carcinomas overlap with those of benign entities. In the present study, discordance in typing was observed in four cases [3]. On cytology, a case was identified as invasive ductal carcinoma, however on histology, it was discovered to be invasive medullary carcinoma. It's nearly impossible to tell the difference between medullary carcinoma and poorly differentiated ductal carcinoma cytologically [11,12]. Large poorly differentiated cells with syncytial architecture, sparse stroma, and a significant lymphoid infiltration characterize medullary cancer cytologically. Medullary carcinoma has higher cell cohesion and macronucleoli than ductal carcinoma. Despite these distinctions, there is a lot of overlap in the diagnosis of these two disorders [3]. In the present study one case was diagnosed as suspicious for malignancy in FNAC and it was turned out to be invasive ductal carcinoma on core biopsy. Kleer et al [13] found that numerous lymphocytes and plasma cells seen both in IDC (Invasive Ductal Carcinoma) and MBC (Medullary Breast Carcinoma). Due to overlapping features, they did not consider background lymphocytic infiltrate to one of the differentiating features of MBC and IDC.

Table 4: Comparison of sensitivity and specificity of FNAC in diagnosis of palpable breast lesions

Study	Total number of cases	Sensitivity	Specificity
Present study	100	97	100
Sushma et al[13]	316	88.7	100
Tiwari et al[14]	21	83.3	100
Palombini et al[15]	1956	95.7	89.6
Qureshi H et al[16]	50	91.6	96.96
Choi et al[17]	1297	77.7	99.2

The sensitivity and specificity of the present study was 97% and 100% . This is comparable to various other studies as shown in the table (Table 4). In the present study study there is slightly higher sensitivity and specificity , this could be due to more of malignant lesions at later stages presentations where the discrepancy in diagnosing benign and malignant lesions narrowed.

Conclusion

Fine needle aspiration cytology can be used to diagnose breast masses since it is a simple, cost-effective, highly accurate, rapid, and somewhat painless treatment. It's unavoidable to get some erroneous negative outcomes. However, there are a few diagnostic pitfalls to be aware of, and cytology diagnosis should be approached with carefully. The gold standard for evaluating breast lesions is histopathological investigation.

References

- Kocjan G, Bourgain C, Fassina A, et al. The role of breast FNAC in diagnosis & clinical management: a survey of current practice. *Cytopathology*. 2008; 19: 271-78.
- Sahil I. Panjvani et al., Utility of Fine Needle Aspiration Cytology in the Evaluation of Breast Lesions. *Journal of Clinical and Diagnostic Research*. 2013;7(12): 2777-2779
- Sushma Hosamane, Meghashree Vishwanath . Fine needle aspiration of breast lumps -Diagnostic pitfalls. *Med Pulse International Journal of Pathology*. 2018; 8(2): 81-86.
- Purasiri P, Abdalla M, Heys SD, Ah-See AK, McKean ME, Gilbert FJ, et al. A novel diagnostic index for use in the breast clinic. *J R Coll Surg Edinb*. 1996; 41: 30- 34.
- Kaufman Z, Shpitz B, Shapiro M, Rona R, Lew S, Dinbar A. Triple approach in diagnosis of dominant breast masses: combined physical examination, mammography and fine-needle aspiration. *J Surg Oncol*. 1994; 56: 254-57.
- Haddad FS. Re: Risk factors for perineal seeding of prostate cancer after needle biopsy. *J Urol*. 1990; 143: 587-88.
- Aamir Sharif et al Cytomorphological patterns of palpable breast lesions diagnosed on fine needle aspiration cytology in females *European Journal of Inflammation* 20 18: 1–8
- Egwuonwu O, Anyanwu S, Chianakwana G et al. Breast lumps in NAUTH, Nnewi: A 5 year review. *Nigerian Journal of Surgery*. 2009; 15: 6–9.
- Mayun A, Pindiga U and Babayo UD (2008) Pattern of histopathological diagnosis of breast lesions in Gombe, Nigeria. *Nigerian Journal of Medicine* 17(2): 159–162.
- Cangiarella JF, Simsir A. Breast. In: Orell SR, Sterrett GF. *Orell and Sterrett's Fine needle aspiration cytology* .5th ed. Churchill Livingstone. Elsevier 2012.156-20
- Scolyer RA, McKenzie PR, AchmedDet al. Can Phyllodes tumors of the breast be distinguished from fibroadenomas using fine needle aspiration cytology? *Pathology* .2001; 33: 437–43
- Tse GM, Ma TK, Pang LM et al. Fine needle aspiration cytologic features of mammary phyllodes tumors. *Acta Cytol* . 2002; 46: 855–63
- Kleer GC, Michael CW. Fine needle aspiration of breast carcinomas with prominent lymphocytic infiltrate. *Diagn Cytopathol* 2000;23:39-42
- Tiwari M. Role of fine needle aspiration cytology in diagnosis of breast lumps. *Kathmandu university medical journal*. 2007; 5(18):215-7
- Palombini L, Fulciniti F, Vetrani A et al. Fine needle aspiration biopsies of breast masses a critical analysis of 1956 cases in 8 years (1976-1984). *Cancer*. 1988;61: 2273-7
- Qureshi H, Amanullah A, Khan K M, Deeba F. Efficacy of fine needle aspiration cytology in the diagnosis of breast lumps. *JPMI*. 2007;21(4):301-4
- Choi YD, Choi YH, Lee JH, Nam JH, Juhng SW, et al. Analysis of fine needle aspiration cytology of the breast. *Acta cytol*. 2004; 48(6):801-6

Conflict of Interest: Nil

Source of support: Nil