Cytomorphological Patterns of Benign Breast Lesions In A Tertiary Care Hospital

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Abstract: Introduction: Benign breast lesions refer to a variety of diseases that may present a wide range of clinical signs and symptoms. Most of the palpable breast lumps are benign but still cause a significant anxiety to the patient and also to the family members. Some of the benign breast lesions are known to be a predisposing risk factor for developing malignancy in later part of the life if not treated in time. Therefore it is mandatory to identify these lesions for appropriate management. Methods: The present study was a retrospective study carried in department of pathology of a tertiary care hospital between April 2016 and March 2018 and included 307 patients who presented with palpable breast lumps. Cytomorphological features of benign breast lesions were studied. The findings were tabulated and analyzed. Results: There were 288 female and 19 male patients. The most common age group involved was 21-30 years. Most of the lumps were of size ≤ 2 centimeters (cms). Maximum number of lesions encountered in our study on FNAC were fibroadenoma followed by benign proliferative mammary lesion. Conclusion: FNAC is a safe, cost effective and outpatient procedure. FNAC gives result very fast and is accurate therefore it is very useful in benign breast lesions to avoid fear of surgery and also gives psychological relief to the patient. [M Chaudhry, Natl J Integr Res Med, 2018; 9(4):32-36]

Key Words: Breast, FNAC, fibroadenoma

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Introduction: Breast is an active organ which undergoes cyclical changes under the influence of various hormones as well as growth factors acting on the epithelial and stromal components.[1] Benign breast lesion refers to a variety of diseases that may present a wide range of clinical signs and symptoms.[2] Most of the palpable breast lumps are benign but still pose a significant anxiety to the patient and also to the family members, which can be allayed by giving assurance that, usually it is benign and can easily be early diagnosed by fine needle aspiration cytology (FNAC).[3]

Some of the benign breast lesions are known to be predisposing risk factors for developing malignancy in later part of the life if not treated in time. Therefore it is mandatory to identify and study these lesions in detail which will help to manage the treatment and separate the high risk group of patients who need a regular follow up and observation for subsequent appropriate management.[4] FNAC has its advantages like rapidity, safety, ease and cheapness. Also it has high sensitivity, specificity and diagnostic accuracy.[5-7] Triple test which includes physical examination of the breast, mammography and FNAC has proved to be an infallible tool for precise diagnosis of palpable breast lesions.[8] The breast lesions are classified as under.[9]

Non neoplastic:

1: Inflammatory:

- Acute mastitis: Lactational mastitis, Subareolar mastitis.
- Chronic mastitis: Nonspecific mastitis: Fat necrosis, Granulomatous mastitis, mammary duct ectasia; Specific mastitis: Tuberculosis, Leprosy, Syphilis, Actinomycosis, Fungal infections, Parasitic infections, Viral infections, Sarcoidosis and Reaction to foreign body.

2.Benign proliferative lesion: Fibrocystic disease, adenosis, collagenous spherulosis.

3.Miscellaneous: Galactocele, Gynecomastia.

Neoplastic:

1. Benign
   - Epithelial lesions: intraductal papilloma, Lactating adenoma.
   - Fibro epithelial lesions: Fibroadenoma, Phyllodes tumour.
2. Malignant.

Aim: The present study was carried out to identify the spectrum of benign breast lesions diagnosed on FNAC for a period of two years.

Methods: The present study was a retrospective study carried in department of pathology in a tertiary care hospital between April 2016 and March 2018 and included 307 patients who presented with palpable breast lumps. Detailed clinical history and physical examination were noted.

Lump breast were examined for site, size, tenderness, mobility and consistency along with condition of

overlying skin and draining lymph nodes. Contralateral breast, nipple and axilla were also examined. The written consent of the patients was taken before FNAC, after explaining the procedure in their language. Ethical approval was also obtained from competent authorities.

FNA was done with standard technique and aseptic precautions by using 10 cc disposable syringe and 22-23 gauge needles. Material was smeared on glass slides. Slides were stained with Leishman-Giemsa stain, papanicolaou (PAP) stain and Hematoxylin and eosin stain. Ziehl Neelsen (ZN) staining was done wherever required. In case of more than one lump, multiple aspirations were done.

Inclusion Criteria:

1. All breast lumps which were clinically and radiologically diagnosed as benign lesions.
2. Both male and females.
3. All age groups.

Exclusion Criteria: Breast lumps which are suspected clinically and diagnosed by imaging studies as malignant.

Results: Out of the 307 cases, in 275 cases, the aspirates were adequate for interpretation and in 32 cases they were inadequate due to very scanty cellularity or were only hemorrhagic. There were 288 females and 19 males. The age distribution of females and males were as follows.

Table 1: Age distribution of the patients

Age group(years)	Female	Male
11-20	51(17.7%)	05(26.31%)
21-30	93(32.29%)	03(15.78%)
31-40	86(29.86%)	04(21.05%)
41-50	35(12.15%)	03(15.78%)
51-60	18(6.25%)	03(15.78%)
61-70	03(1.04%)	00(0%)
71-80	01(0.34%)	00(0%)
81-90	01(0.34%)	01(5.26%)
Total	288	19

Maximum number of female patients were in age group 21-30 years followed by 31-40 years. The youngest patient was 13 years old while the oldest patient was 85 years old. In males maximum number of cases were in age group 11-20.

Table 2: Laterality of breast lesions

Laterality	Number of cases
Right	130(42.34%)
Left	167(54.39%)
Bilateral	10(03.25%)

Out of 307 cases 130 (42.34%) patients had lump in right breast, 167 patient had lump in left breast (54.39%) and 10 (03.25%) patients presented with bilateral lump.

Table 3: Size of breast lumps

Size of lumps (in cms)	Number of patients
≤2	148(48.52%)
2-4	121(39.67%)
4-6	26(8.52%)
6-8	07(2.29%)
8-10	02(0.65%)
>10	01(0.32%)
Total	305

*2 cases were of vague nodularity.

Maximum number of patients (148) had lump of ≤2 cm. Minimum size of lump was 0.5 cm while maximum lump size noted was 16 cms.

Table 4: Categorization of cytological samples

Total number of cases	307
Inadequate	32(10.42%)
Inflammatory	38(12.37%)
Benign	237(77.19%)

Out of the 307 cases, in 275 cases, the aspirates were adequate for interpretation and in 32 (10.42) cases they were inadequate. Inflammatory lesion were 38(12.37%) while 237(77.19%) were categorized as benign.

Table 5: Distribution of inflammatory lesions

Acute mastitis/abscess	19(50%)
Granulomatous mastitis	09(23.68%)
Tubercular mastitis	03(7.89%)
Fat necrosis	01(2.63%)
Duct ectasia	03(7.89%)
Chronic non specific mastitis	03(7.89%)
Total	38

In inflammatory lesions maximum number of cases were of acute mastitis (19 cases) followed by granulomatous mastitis (9 cases). There was one case of fat necrosis.

Table 6: Distribution of benign lesions

Galactocele	2(0.84%)
Fibroadenoma	127(53.58%)
Fibroadenosis	8(3.37%)
Phyllodes tumor	7(2.95%)
Gynaecomastia	10(4.21%)
Papilloma	2(0.84%)
Epidermal cyst	2(0.84%)
Benign proliferative mammary lesion	45(18.98%)
Fibrocystic disease	21(8.86%)
Lipoma	4(1.68%)
Apocrine adenoma	1(0.42%)
Lactating adenoma	2(0.84%)
Adenomyoepithelioma	1(0.42%)
Simple cyst	4(1.68%)
Intramammary reactive lymph node	1(0.42%)
Total	237

Among benign lesions maximum number of cases were of fibroadenoma followed by benign proliferative mammary lesion. There was one case each of apocrine adenoma, adenomyoepithelioma and intramammary reactive lymph node.

Discussion: Benign breast lesions includes heterogeneous diverse group of lesions. Some of these are result of exaggerated physiologic phenomenon rather than being a true pathological entity. Generally they are largely classified into Non proliferative and Proliferative lesions.Non proliferative breast lesions includes breast cysts, metaplastic epithelial changes, epithelial related calcifications and mild ductal hyperplasia of the usual type. Proliferative breast lesions are enormously complex and interrelated group of disorders, some of them have an increased risk of developing carcinoma breast in the future, and are thus considered as risk entities, rather than premalignant lesions.

The most common age group involved by benign breast disease in our study includes females of 21-30 years age group. Similar findings were seen by Farkhanda and co-authors[10], Godwin E et al.[11], Naveen et al.[12], Karki et al.[13], Guray et al.[14] and Dahri et al.[15] Left breast is more commonly involved in our study and this was also observed by Prakash et al whereas in a study done by Chandanwale S et al involvement of right breast was more common.[16,17] Most of the lumps in the present study were of size ≤ 2 cms which is in concordance with study done by Krishnaswamy.[18]
The most common diagnosis on FNAC in our study was fibroadenoma. Similar results were observed by Farkhanda and coauthors[10], Malik et al[19] and Priyadarshani J et al.[20] Definitive diagnosis of fibroadenoma was made when cytology smears showed the presence of characteristic cytomorphologic features viz presence of cohesive sheets of ductal epithelial and myoepithelial cells, fibromyxoid stroma and presence of numerous bare bipolar nuclei in the background. We had five cases each of cellular fibroadenoma and complex fibroadenoma.

A simple fibroadenoma does not confer additional risk of malignancy, whereas a complex fibroadenoma poses a slight higher risk of developing malignancy.[21] Increase in awareness about breast lumps and growing concerns for detecting breast malignancies at an earlier stage has led to the early detection and evaluation of Breast mass.

Second most common lesion was beingn proliferative mammary lesion (45 cases). We had 7 cases of phylloides tumor which were diagnosed on the basis of presence of large cellular stromal fragments, benign duct epithelial cells and benign bare bipolar nuclei.

There were 2 cases of epidermal cyst. Common sites for epidermal inclusion cyst are head, neck, trunk and extremities. Earlier reported cases of epidermal cyst in breast are few and to date less than 46 cases in all have been reported. They remain underreported because of their benign nature and non specific clinical presentation.[22] Among males most common lesion was gynaecomastia. Gynaecomastia in young age is associated with hormonal changes at puberty where as in later years, it may be caused by hormonally active tumors, cirrhosis or medications.[23]

There were two cases of lactating adenoma in our study. Both the patients gave history of breast feeding. Smear were cellular and revealed benign epithelial cells scattered singly and in small groups having foamy to finely vacuolated cytoplasm, uniform nuclei with fine chromatin and prominent nucleoli. Background had abundant foamy material. We reported one case each of adenomyoepithelioma and apocrine adenoma. Adenomyoepihelioma is a rare biphasic tumor composed of epithelial and myoepithelial component. It generally presents as single circumscribed nodule.[24] Our cytological findings revealed highly cellular smears composed of large clusters of epithelial aggregates and less cohesive

myoepithelial cells. Small clusters or dispersed myoepithelial cells with epithelioid morphology were also present and showed intranuclear and intractyoplasmic vacuoles.

Apocrine adenoma is adenoma with apocrine cytology throughout. It is composed exclusively of benign apocrine cells which are sharply demarcated from surrounding breast tissue. It has minimal supportive stroma. Careful evaluation of the entire lesion is recommend because cytological atypia, necrosis and other invasive features suggest atypical hyperplasia or malignancy.[25] In our case cytological diagnosis of apocrine adenoma was based on presence of cuboidal cells arranged in glandular pattern. These cells had granular and eosinophilic cytoplasm. There was no cytological atypia. No stromal fragments were seen. 2 cases of papilloma were reported. Cytological features in these cases showed folded and branching sheets of bland epithelial cells having strands of fibrovascular stroma. Some true papillary fragments were also evident. There was minimal nuclear atypia.

Among the inflammatory group of study out of total 38 cases there were 19 cases of acute mastitis. Most of these patients had complaints of fever, pain, tenderness and redness in the breast. Cytology revealed the presence of inflammatory infiltrate of neutrophils in all the cases. There is inflammation of interlobular connective tissue of the breast in acute mastitis and if not appropriately managed can lead to septicemia.[26]

In our study 3 cases of tubercular mastitis were diagnosed. FNA diagnosis was based on presence of epithelioid cells, caseous necrosis with or without acid-fast bacilli (AFB). Tuberculosis is the commonest cause of caseating granulomas. Ziehl Neelsen staining revealed the presence of acid-fast bacilli in one case. The detection of acid-fast bacilli on FNAC is not mandatory, since for AFB to be seen microscopically, their number must be 10,000 to 100,000/ml of the aspirate.[27] Other cytological features were presence of chronic inflammatory cells like lymphocytes and plasma cells. These patients were started standard antitubercular treatment and showed improvement clinically on subsequent follow up, thereby concluding the usefulness of FNAC in managing this condition. Mehrotra studied cytomorphology of 20 cases of tuberculous mastitis and concluded FNAC to be very reliable in diagnosing this condition.[28]

There was 1 case of fat necrosis. The patient had history of trauma on the affected side of the breast. Cytological features revealed foamy macrophages, fat droplets and fragments of adipose tissue along with chronic inflammatory cells present in background of dirty granular debris.

We had 3 cases of duct ectasia. Lump was retroareolar in location. Two patients were having history of nipple discharge. Cytology displayed a paucicellular aspirate, cantaining few scattered, cohesive clusters of ductal epithelial cells with mild nuclear atypia and distinct, peripherally located myoepithelial cells. Intermingled within the ductal elements were seen foamy macrophages.

Conclusion: FNAC is a safe, cost effective and outpatient procedure. Success of FNAC is dependent upon several significant contributing factors like experience of aspirator, expert cytological interpretation and a balanced analysis based upon correlation of cytological and clinical history of the patient. FNAC gives result very fast and is accurate therefore it is very useful in benign breast lesions to avoid fear of surgery and also gives psychological relief to the patient. Whenever there is any doubt the investigations like mammography and trucut biopsy can be used to differentiate between benign and malignant lesions. Benign breast lesions commonly affect the younger age group. Fibroadenoma is the most common lesion encountered amongst the benign lesions.

References:

1. Abhijit MG, Anantharaman D, Bhoopal S, Ramanujam R. Benign breast diseases: experience at a teaching hospital in rural India. Int J Res Med Sci. 2013;1(2):73.
2. Guray M, Sahin AA. Benign breast diseases:classification, diagnosis, and management.The Oncologist. 2006;11(5):435-449.
3. Vaidyanathan L, Barnard K, Elnicki DM. Benign breast disease: When to treat, when to reassure, when to refer. Cleve Clin J Med. 2002;69:425-32.
4. Vimal M, Chitra T. Spectrum of benign breast diseases in females of reproductive age group. Journal of Research in Medical and Dental Science. 2016;4(2):137-40.
5. Chaiwun B, Settakorn J, Ya-In C, Wisedmongkol W, Rangdaeng S, Thorner P. Effectiveness of fine-needle aspiration cytology of breast: Analysis of

2375 cases from northern Thailand. Diagn Cytopathol. 2002;26:201-5.
6. Nguansangiam S, Jesdapatarakul S, Tangjitgamol S. Accuracy of fine needle aspiration cytology from breast masses in Thailand. Asian Pac J Cancer Prev. 2009;10:623-6.
7. Cobb CJ, Raza AS. Obituary: —Alas poor FNA of breast — We knew thee well!. Diagn Cytopathol. 2005;32:1-4.
8. Kaufman Z, Shpitz B, Shapiro M, Runa R, Lew S, Dinbar A. Tripple approach in the diagnosis of dominant breast masses: Combined physical examination, mammography and fine needle aspiration. J Surg Oncol. 1994;56:254-7.
9. Rosai J. The breast. Rosai and Ackerman's Surgical Pathology. 9th ed. Vol 2. St. Louis, Missouri. Mosby; 2004:pp.1763-1876.
10. Farkhanda JD, Muhammad SA, Ahsan AL, Noor MK, Imtiaz S, Zulfiqar IM. An early diagnosis of benign breast diseases. Journal of Surgery Pakistan. 2010;15(4):74-78.
11. Godwins E, David D, Akeem J. Histopathologic analysis of benign breast diseases in Makurdi, North Central Nigeria. International Journal of Medicine and Medical Sciences. 2011;3(5):125-128.
12. Naveen N, Mukherjee A, Mahajan V. A clinical study of benign breast disease in rural population. J Evol Med Dent Sci. 2013;2(30):5499–511.
13. Karki OB, Kunwar D, De A. Benign Breast Diseases: Profile at a Teaching Hospital. Am J Public Health Res. 2015;3(4A):83–6.
14. Guray M, Sahin AA. Benign breast diseases: classification, diagnosis, and management. The Oncologist. 2006;11(5):435–49.
15. Dahri FJ, Awan MS, Leghari AA, Khaskheli NM, Soomro I, Memon ZI. An early diagnosis of benign breast diseases. J Surg Pak Int. 2010;15(4):186.
16. Muddegowda PH, Lingegowda JB, Kurpad R, PG Konapur, AS Shivarudrappa and PM Subramaniam. The value of systematic pattern analysis in FNAC of breast lesions: 225 cases with cytohistological correlation. J Cytol. 2011;28(1):13-19.
17. Chandanwale S,Rajpal M, Jadhav P, Sood S, Gupta K, Gupta N. Pattern of benign breast lesions on fnac in consecutive 100 cases: a study at tertiary care hospital in India. IJPBS. 2013;4:129-138
18. Krishnaswamy U. Profile of benign breast diseases in urban India. Indian J Surg. 2003; 65(2):178-181.
19. Malik R, Bhardwaj VK; Breast lesions in young females. A 20 year study for significance of early recognition. Indian J Pathol Microbiol. 2003;46(4): 559-562.
20. Jyoti Priyadarshini Shrivastava, Alok Shrivastava. "Fine Needle Aspiration Cytology of Breast Lumps with Clinical and Histopathological Correlation: A 2 Year Study in Gwalior, India". Journal of Evolution of Medical and Dental Sciences. 2015;4: 9729-9734.
21. Carter BA, Page DL, Schuyler P, Parl FF, Simpson JF, Jensen RA, et al. No elevation in long-term breast carcinoma risk for women with fibroadenomas that contain atypical hyperplasia. Cancer. 2001;92(1):30–6.
22. Chandanwale SS, Gupta K, Dharwadkar AA, Pal S, Buch AC, Mishra N. Pattern of palpable breast lesions on fine needle aspiration: A retrospective analysis of 902 cases. J Midlife Health. 2014;5(4):186–191.
23. Coen P, Kulin H, Ballantine T, Zaino R, Frauenhoffer E, Boal D, et al. An aromatase producing sex-cord tumour resulting in prepubertal gynaecomastia. N Engl J Med. 1991;324:317–22.
24. Hamperal H. The myoepithelia (myoepithelial cells): Normal state; regressive changes; hyperplasia; tumors. Curr Top Pathol. 1970;53:161-220.
25. Apocrine adenoma of breast. PathologyOutlines.com website. http://www.pathologyoutlines.com/topic/breastapocrineadenoma.html. Accessed May 30th, 2018.
26. Michie C, Lockie F, Lynn W. The challenge of mastitis. Arch Dis Child. 2003 ;88(9):818–21.
27. Pagel W, Simmonds F, Mcdonald J, Nassan E. Pulmonary tuberculosis. 4th ed. London. Oxford University Press;1964:pp.900.
28. Mehrotra R. Fine Needle Aspiration Diagnosis of Tuberculous Mastitis. Indian J. Pathol Microbiol. 2004; 47(3): 377-380.

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