Case series:

Inflammatory lesions of breast: a case series

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ABSTRACT:

Introduction: Inflammatory pathology accounts for 5-10% cases of benign breast lumps. FNAC is a quick, cheap and diagnostic procedure for inflammatory breast lesions. It helps in differentiating between benign and malignant lesions. The common etiologies causing inflammatory lesions are mastitis, abscess, fat necrosis, duct ectasia, mammary tuberculosis, sarcoidosis, idiopathic granulomatous mastitis and parasitic lesions.

Material and Methods: A retrospective study of 114 cases was done. Cytological and histological correlation was seen in 47 cases. Prior to FNAC, clinical history and physical examination were also correlated.

Observations: All the patients were females with an age incidence varying from 11 to 60 years. Maximum number of cases seen was of breast abscess. The aspirations revealed blood mixed pus like material, 6 of the pus culture were positive for Gram positive bacteria and rest were non significant due to start of antibiotic therapy. Next to this galactocele was diagnosed with 25 cases. Granulomatous mastitis was the next important FNAC finding leading to inflammation. Fine needle aspiration cytology of about 16 granulomatous lesions have been reported out of which 8 were diagnosed as tubercular. After granulomatous mastitis fat necrosis was other important etiology with 15 cases. Parasitic lesions were also diagnosed in 8 cases, six showed microfilaria.

Conclusion: Breast FNAC provides important information regarding type of inflammatory process in breast lesions and hence, prevents unnecessary use of invasive techniques like biopsy etc. FNAC being easy and rapid method for diagnosing inflammatory lesions of breast should be done in patients presenting with breast lump.

Keywords: Breast, FNAC, Inflammatory lesions.

INTRODUCTION

Inflammatory conditions of the breast account for 5-10% of all the benign breast diseases. Main causes of inflammatory conditions of breast are lactation, various bacterial, parasitic and fungal infections and trauma. Clinically these patients presents as generalized cellulitis or a localized mass that may present as a painful swelling. FNAC is a quick, cheap and diagnostic procedure for inflammatory breast lesions. It helps in differentiating between benign and malignant lesions. Most of the inflammatory lesions of breast are encountered in young and reproductive age group although premenopausal age groups are also affected. The common etiologies causing inflammatory lesions are mastitis, abscess, fat necrosis, duct ectasia, mammary tuberculosis,
sarcoidosis, idiopathic granulomatous mastitis and parasitic lesions. Other rare conditions include infarction of the breast, inflammatory reaction to breast implants and vasculitis of the breast.

REVIEW OF LITERATURE

Kessler and Wolloch in 1972, first described granulomatous mastitis as a benign inflammatory disease. It mostly presents as a discrete mass firm in consistency. Mostly women in their reproductive age group are affected. Most inflammatory lesions of the breast are secondary to lactation, trauma, bacterial infection or foreign body. Breast can also get involved with tuberculosis, fungal, viral or parasitic infections presenting as a vague lump or may mimic as a malignant lesion. In recent scenario, FNAC is being performed as a screening and pre-operative test to categorize various types of breast lesions. A study of Khatun et al in the year 2000 showed that in patients with palpable breast lumps FNAC showed a very high sensitivity, specificity and accuracy. In diagnosis of inflammatory lesions of breast aspiration cytology are of great help in preventing unnecessary surgical intervention. It also provides an early diagnosis with only 10-30% of the cost of surgical biopsy. Around 90-95% accuracy in preoperative diagnosis of various breast lesions was seen in various studies. As FNAC became more reliable and faster in diagnosing malignancy so the use of other diagnostic procedures like frozen section, trucut biopsy had been reduced to a large extent.

MATERIAL AND METHODS:

The retrospective study was done in patients attending the OPD of UPUMS, Saifai and referred to department of pathology for FNAC procedure. Prior to aspiration, detailed history with physical examination of both the breasts and the lump were carried out to assess its size, mobility, and evidence of any structural deformity, discharging areas and lymph node examination. History of lactation and any previous surgery of the breast region were taken. The cytopathology report was done with routine MGG, Papanicolaou staining along with special staining like AFB and routine fungal stains. The aspirates were categorized and selected after various findings like presence of inflammatory cells and/or granulomas with occasional benign ductal epithelial cells, cystic macrophages, giant cell reaction or parts of some parasite. In this study histology was possible in 50 cases. The surgical specimens received were evaluated grossly and representative areas were taken for histopathological evaluation. The tissue was fixed in 10% buffered formalin and then processed by the routine paraffin embedding techniques. Sections were cut at 4-5 microns thickness and stained with hematoxylin and eosin. Correlation between cytological and histological diagnosis were done.

OBSERVATIONS:

Total cases diagnosed as inflammatory lesions of breast were 114 cases. Histopathological correlation was available in only 47 cases. All the patients were females with an age incidence varying from 11 to 60 years (Table 1). Maximum number of cases seen was of breast abscess (Table 2). The duration of symptoms varied from one month to four years. They presented either as painless lump in breast or tender, inflamed lesion. A well-defined mass was the commonest presentation (63%); however, with the presence of signs of inflammation like pain (49%), discharge (33%), and nipple retraction (15%) were also present. Axillary lymph node enlargement was infrequently seen (13%) (Table 3).
Most observed lesions were breast abscess present in 38 cases (33.4%). The aspirations revealed blood mixed pus like material. 6 of the pus culture were positive for Gram positive bacteria and rest were non-significant due to start of antibiotic therapy. The aspirate was blood mixed purulent material in most of the cases of breast abscess. Most common age group showing maximum number of inflammatory lesions was in the 21-30 year group. Clinically the patient of most cases of breast abscess presented with a tender inflamed swelling and the smears showed abundant number of neutrophils, lymphocytes along with histiocytes and proteinaceous material (Figure 1).

Next to this galactocele was diagnosed with 25 cases. Most of the patients were young females and they presented with a soft cystic lesion with a history of lactation. Most important etiology of galactocele is due to obstruction of the mammary duct. The cytology smears revealed generally fatty secretory material with scattered foamy macrophages and occasional ductal epithelial cells (Figure 2).

Granulomatous mastitis (Figure 3) was the next important FNAC finding leading to inflammation. Fine needle aspiration cytology of about 16 granulomatous lesions have been reported out of which 8 were diagnosed as tubercular, two of them were diagnosed when they came with recurrence of breast mass after initial surgical excision previously done for benign proliferative breast disease and in rest no proper cause was present so they were categorized into idiopathic granulomatous mastitis. Cases diagnosed as tubercular showed acid fast bacilli on ZN staining (Figure 4). These lesions arise due to various causes like tuberculosis, fungal, bacterial lesions, sarcoidosis and filariasis, foreign body reactions and idiopathic granulomatous mastitis.8,9

After granulomatous mastitis fat necrosis was other important etiology with 15 cases. Six patients were premenopausal and 9 were in reproductive age group. Microscopic picture of fat necrosis is characterized by infiltration of foamy histiocytes and foreign body type giant cells, necrosis around fat cells and lipid vacuoles and cystic areas. In many cases lymphocytic infiltration and plasma cells may be seen to varying degrees. As fat necrosis evolves, fibrosis develops within the lesion, forming a scar and fibrous walled cysts that can calcify.

Benign simple cystic lesions were next presentation of inflammatory lesions. Ten were simple cysts and two were diagnosed as epidermal inclusion cyst. Most of the benign cysts resolved on aspiration while aspirates of epidermal cysts were blood mixed keratinous material.

FNAC also helped in diagnosis of parasitic lesions of breast. In our set up eight cases of parasitic lesions were reported, six cases were of filariasis (Figure 5), one of cysticercosis (Figure 6) and one of hydatid cyst. In most of the cases of FNAC, actual parasite structures were demonstrable in the smears. In case of parasitic lesion due to cysticercous, parts of cysticercus cellulosae were identified. The smears showed fibrillary background, inflammatory cells and part of hooklets and was later confirmed on histopathological examination.
Table 1: Age wise distribution of cases:

<table>
<thead>
<tr>
<th>Age group (in years)</th>
<th>No. of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-20</td>
<td>15</td>
</tr>
<tr>
<td>21-30</td>
<td>45</td>
</tr>
<tr>
<td>31-40</td>
<td>38</td>
</tr>
<tr>
<td>41-50</td>
<td>12</td>
</tr>
<tr>
<td>51-60</td>
<td>04</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>114</strong></td>
</tr>
</tbody>
</table>

Table 2: Distribution of lesions with Cyto-histo correlation.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Types of inflammatory lesions</th>
<th>No. of cases diagnosed by Cytology</th>
<th>No. of cases with Histopathology confirmation</th>
<th>Cyto-Histo correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acute Mastitis/Breast abscess</td>
<td>38</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>Galactocele</td>
<td>25</td>
<td>04</td>
<td>04</td>
</tr>
<tr>
<td>3</td>
<td>Granulomatous Mastitis</td>
<td>16</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Fat necrosis</td>
<td>15</td>
<td>06</td>
<td>05</td>
</tr>
<tr>
<td>5</td>
<td>Cystic lesions</td>
<td>12</td>
<td>08</td>
<td>06</td>
</tr>
<tr>
<td>6</td>
<td>Parasitic lesions</td>
<td>08</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>114</strong></td>
<td><strong>50</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

Table 3: Distribution according to clinical presentation.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Clinical Presentation</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Palpable breast lump</td>
<td>65</td>
<td>63%</td>
</tr>
<tr>
<td>2</td>
<td>Nipple discharge</td>
<td>34</td>
<td>33%</td>
</tr>
<tr>
<td>3</td>
<td>Breast pain</td>
<td>50</td>
<td>49%</td>
</tr>
<tr>
<td>4</td>
<td>Nipple retraction</td>
<td>16</td>
<td>15%</td>
</tr>
<tr>
<td>5</td>
<td>Lymphadenopathy</td>
<td>14</td>
<td>13%</td>
</tr>
</tbody>
</table>
Figure 1: Smears shows abundant number of neutrophils, lymphocytes along with histiocytes and proteinaceous material. (Giemsa, 400X).

Figure 2: Smear showing fatty secretory material with scattered foamy macrophages. (Giemsa, 100X).

Figure 3: Smear showing occasional giant cell, lymphocytes and plasma cells in necrotic background. (Giemsa, 100X).

Figure 4: Smear showing pink coloured acid fast bacilli. (ZN stain, 1000X).
DISCUSSION:

Age and sex incidence: The most common age group in our study was from 21-30 years (39%). This is also supported by Farkhanda et al and Echejoh et al in their study.\textsuperscript{10,11} FNA is considered a useful technique for early diagnosis of breast masses and differentiating the lesions without surgical intervention. In 1969 Verhaeghe and Cornillot formalized the triple test, combining clinical, radiological and cytological examination for the diagnosis of breast lesions. Maximum number of cases were of Acute mastitis and breast abscess. It is in accordance with Knight et al.\textsuperscript{12} In most of the cases of breast abscess organisms for acute mastitis are Staphylococcus aureus, Staphylococcus epidermidis, streptococcus or Bacteroides species and mixed anaerobic infections. In our study also most of the cases culture was positive for gram positive bacteria. Primary breast abscesses develop as a complication of mastitis.\textsuperscript{13,14} Acute mastitis can be further differentiated according to etiology into lactating and non-lactating, the lactating is more common in the first six weeks of breast feeding with highest incidence during the second and third week.\textsuperscript{15,16} In our cases ten patients had history of lactation and the period varied from 1 to 2 months. The patients responded well to antibiotic therapy except in three cases where incision and drainage was done. Galactocele was the next finding which was seen mostly in young females with history of lactation. They presented with a soft to firm cystic lump and
nipple discharge. These are filled with milk secretions and ductal epithelial cells that resemble in appearance like foam cells.¹⁷ Smears generally showed fatty droplets, ductal cells having abundant fragile cytoplasm, macrophages and degenerated acinar cells. Most of them were correctly and rapidly diagnosed and responded well to treatment.

Granulomatous mastitis (GM) is another inflammatory lesion in which the cause is either due to bacterial, fungal, viral, foreign body induced or idiopathic. Sixteen cases were diagnosed in which 8 cases were diagnosed as tubercular. They came with chief complaints of lump in the breast, associated with off and on fever and weight loss. Six cases showed epithelioid cell granulomas and caseous necrosis, while two cases showed only inflammatory cells and caseous necrosis and were diagnosed on performing the AFB staining. In total six cases AFB was positive. Lacambra et al also reported 29 (46.77%) cases of tuberculosis mastitis among total 62 cases of granulomatous mastitis.¹⁸

In our study, we found that the most common cytological feature of GM was the presence of epithelioid histiocytes, followed by the presence of predominantly lymphocytes in the background, multinucleated giant cells, and granulomas. Absence of caseous necrosis and langhan’s giant cell along with negative AFB helped in ruling other types of granulomatous mastitis. The first description of mammary tuberculosis was given by Sir Astley Cooper in 1829.⁵

Tuberculous mastitis is mostly seen in females of reproductive age group during the lactation period.¹⁹,²⁰ However in our set up most of the cases were in the age group of 30-40 years and were non-lactating. Four of them were already taking ATT. The appearance of these histiocytes was distinct, with plump nuclei and a moderate to abundant pale pink cytoplasm. This appears to be a common feature, having been reported in all cases of GM in the literature.²¹,²² Other 6 cases of granulomatous mastitis were categorized into idiopathic granulomatous mastitis and foreign body induced. The etiology of idiopathic granulomatous mastitis is still unclear and causes could be due to autoimmune diseases, in the postpartum period, use of oral contraceptives or undetected organisms.²³,²⁴ In our cases both fungal and bacterial culture were negative. There was no history of use of oral contraceptives and hormonal assays were normal. Smears showed epithelioid cell granulomas along with mixed inflammatory cell infiltrate mainly lymphocytes, neutrophils, monocytes, histiocytes and plasma cells along with multinucleate giant cells. No caseous necrosis was seen. The etiology of idiopathic granulomatous mastitis was given by Fletcher and colleagues as damage to ductular epithelium by infection, some previous injury trauma or exposure to some chemical agent resulting in inflammatory granulomatous reaction.²⁵ In our study two patients had previous history of trauma while in rest four no proper etiology was found.

Fat necrosis results mostly due to non suppurative inflammation of breast tissue resulting due to aseptic saponification of fat by blood and tissue lipases.²⁶,²⁷ Patient of fat necrosis present with a single, multiple smooth or firm nodules. It may be associated with ecchymosis, inflammation, tenderness, skin retraction of the nipple and sometimes lymphadenopathy.²⁸ The various predisposing factors of fat necrosis include
trauma, radiotherapy, various anticoagulant drugs, operative procedures on breast, implant removal, breast reconstruction, duct ectasia and breast infection. In follow up cases of patients after breast surgery or reconstruction breast procedure after breast cancer careful screening for malignancy should be done and radiological correlation should be made.

Fat necrosis radiologically simulates like a recurrent breast cancer on MRI. Therefore cytological evaluation of such lesions helps in arriving at a proper diagnostic approach. Hadfield described 66% of lesions which presented as very hard and fixed swelling in 50% of cases.\(^{29}\) Pullyblank et al in 45% of cases found various features suggestive of malignancy.\(^{30}\) In our set up 6 patients were premenopausal and rest were in reproductive age group. 70% of the patients presented with a hard fixed swelling. Out of six cases of histopathology, one case was positive for malignancy and rest five histological diagnosis was in concordance with cytology.

Among various cystic lesions reported most were encountered in the age group of 40-50 years and duration varied from 6 months to 4 years. Ten were simple cyst and two were diagnosed as inflamed epidermal inclusion cyst. Generally simple cystic lesions are soft, palpable lesions with distinct borders, may be unilateral or bilateral. Simple Cysts begin as fluid accumulation in the TDLU because of distension and obstruction of the efferent ductular architecture.\(^{31}\) In a study done by Berg WA et al all small simple cystic lesions are more commonly seen in premenopausal women.\(^{32}\) Most simple cysts are benign and do not require any treatment or further diagnostic workup. Some complex cysts may require further investigation and biopsy however majority of them are benign.\(^{33}\)

Epidermoid cyst of the breast is an uncommon lesion in which infection resulting in inflammatory changes can occur. Rarely malignant transformation can occur. In our case only inflammatory changes with giant cell reaction was seen and age group affected was reproductive age. Fine-needle aspiration cytology (FNAC) smears showed numerous anucleate, few nucleate squamous cells and keratinous debris. Etiology of epidermal inclusion cyst can be due to either damage to epidermis which gets implanted deep within the breast tissue and it can occur after trauma, reduction mammoplasty and needle biopsy. Other causes could be progressive cystic ectasia of the infundibulum of hair follicles or squamous metaplasia of normal columnar cells within an ecstatic duct in fibroadenoma, fibrocystic change or phyllodes tumor.\(^{34,35}\)

Excision of all epidermoid cyst in the breast has been emphasized by Lam et al because of the potential complications such as infection and malignant transformation.\(^{36}\)

Eight cases of parasitic lesions were seen. All of them presented with a diffuse lump, unilateral breast involvement and in three cases axillary lymph nodes were enlarged. Six cases of filariasis, two of cysticercosis and one of hydatid cyst (HC) were seen and confirmed by histopathological examination. The superficial parasitic nodules often give false appearance of benign or malignant mesenchymal tumors or as lymphadenopathy. FNAC has emerged as a quick and effective method for the diagnosis of parasitic lesion. Cysticercosis is the larval form of the cestode Taenia solium. Cytodiagnosis of cysticercosis is
made when smears show parasitic fragments including its bladder wall and hooklets, fibrillar structures, sometimes with calcospheres, tegument thrown into rounded wavy folds, scolex with hooklets, and hyaline membrane surrounding it. The presence of scolex in cytology smears is an uncommon finding. No scolex or hooklets were seen in any of our aspirates. In our case diagnosis of cysticercosis was suspected due to presence of parts of fragmented membranous structures and calcareous spheres and later confirmed on histopathological examination.

Superficial HC usually presents as slow growing, fluctuant, and painless mass. It may develop in almost any part of the body. The most common involved site is liver (75%), followed by lung (15%) and only 10% occur in other areas of the body. The diagnosis of hydatid cyst of is usually made when the fragments of hyaline lamellated cell wall membrane, scolices, hooklets and brood capsules are seen in the smears. Out of six cases of filariasis in two cases lymphadenopathy was present. Age group involved was generally in 30-40 years. Clinical presentation was a vague painless swelling and heaviness in the breast. Filariasis is generally transmitted by the Culex mosquito and is caused by two closely related nematodes: Wuchereria bancrofti and Brugia malayi. W. bancrofti is responsible for 90% cases of filariasis. All 5 cases of filariasis in our study were also caused by W. bancrofti. The majority of patients with filariasis are asymptomatic and diagnosed incidentally. Microfilaremia and eosinophilia are common in the acute phase. Other areas where microfilaria can be detected are thyroid, skin and soft tissue swellings, epididymis, lymph nodes, urine, endoscopic biopsies and pleural or peritoneal fluids. In our study, none of the patients was clinically suspected of filariasis; clinically they presented with breast lump (4 cases) and lymphadenopathy (2 cases). All cases showed mild to severe inflammatory reaction. In 4 cases histopathological examination was also done. In our study, only two cases had eosinophil in the aspirate; hence, eosinophils are not necessarily seen in lesions of filariasis. The most common stage, found in cytological smears is microfilaria (62.3%), the adult worm being seen less commonly (13.7%). In our set up mostly larval form was seen in 3 cases and rest were confirmed by histopathological evaluation.

CONCLUSION:
Breast FNAC provides important information regarding type of inflammatory process in breast lesions and hence, prevents unnecessary use of invasive techniques like biopsy etc. FNAC being easy and rapid method for diagnosing inflammatory lesions of breast should be done in patients presenting with breast lump.

REFERENCES:


