



FINE NEEDLE ASPIRATION CYTOLOGY OF BREAST LESIONS.

Pathology

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ABSTRACT

A total of 243 cases were included in the study of breast lesions. Study included prospective analysis which was done for one year. All patients were subjected to FNAC. Cytological study was done in all cases and histopathological correlation was achieved in 39 cases. A 23 gauge needle using 20 cc syringe was used for aspiration.

RESULTS Out of 243 cases, 5 aspirates (2.06%) were considered inadequate in females due to hypocellularity, aspiration, smearing and staining errors. So, a total of 238 cases were included in the present study. 212 cases (89.06%) were females, out of these, 188 (88.68%) were benign and 20 cases (9.43%) were malignant and 4 cases (1.89%) were suspicious of malignancy. 26 cases were males (10.09%).

CONCLUSION FNAC is an essential component in the preoperative management of breast lesions. Preoperative categorization of breast lesions is very important for management of the patient. Success of FNAC depends upon factors like aspirator's experience, skillful cytological interpretation and correlation of cytological and clinical information of the patient. Histological correlation indicated FNAC to be a good diagnostic tool.

KEYWORDS

aspiration cytology, fine needle, breast, breast diseases.

Introduction

The use of needle aspiration can be traced back to 1846 when Kun reported on the use of needle aspiration for cancer diagnosis. In 1927, Dudgeon and Patrick proposed needle aspiration of tumors as a means of rapid microscopic diagnosis. Martin and Ellis, in 1930 published their first monumental paper on aspiration needle biopsy. (Rosa M, 2008). The European workers popularized the technique employing thin needles (22 gauge and higher) (Orell S, Sterret G, 2011). In India, FNAC was first introduced during the early 1970s (Das DK, 2003). Sir James Paget is credited for aspirating malignant cells from a breast cancer patient in 1853. Martin and Ellis also worked during 1930 on aspiration biopsy of breast (Bibbo M, Wilbur D, 2008). FNAC is used in the diagnosis of various breast lesions due to its high diagnostic yield, rapidity and safety. It is a minimally invasive procedure. Smears are made from aspirate, stained and examined under a microscope. Diagnosis can often be made quickly. The breast or mammary gland is covered by skin and subcutaneous tissue and rests on the pectoralis muscle, from which it is separated by a fascia. It is composed of 15–25 lobes that converge on the nipple in a radial pattern. Each lobe consists of a lactiferous duct, lactiferous sinus, segmental collecting duct, subsegmental duct, ductule and acini. The breasts are composed of specialized epithelium and stroma that may give rise to both benign and malignant lesions.

Materials and Methods

The study was conducted in the cytology section of Post Graduate Department of Pathology, Government Medical College, Jammu for a duration of one year, w.e.f. 1st November 2014 to 31st October 2015. An informed and written consent was taken from the patients in their native language before performing FNAC. All females with unknown primary diagnosis of breast mass/lump or mammographically detected lesions were included in this study. Detailed clinical history and relevant general physical examination, systemic and local examination was done on each patient. For superficially located lesions, direct FNAC was performed and for deep seated lesions, Ultrasound guided or CT guided FNAC was performed. The aspirate retrieved was expressed on to the slides so as to obtain 4-6 smears. The smears were then stained by May Grunwald Giemsa and Papanicolaou stain for microscopic examination.

Results

A total of 238 cases were included in the present study. 212 cases (89.06%) were females and 26 cases were males (10.09%). In females, age ranged between 11 and 83 years with a mean of 31.85 years. Out of 212 cases, 188 (88.68%) were benign and 20 cases (9.43%) were malignant and 4 cases (1.89%) were suspicious of malignancy. In benign lesions, maximum numbers 82 (38.68%) of cases were

fibroadenoma followed by 36 cases (16.98%) of fibrocystic disease and 30 cases (14.15%) of benign breast disease. Inflammatory lesions were acute mastitis/abscess 23 (10.85%), granulomatous mastitis 4 (1.89%), and fat necrosis 2 (0.94%). Other lesions were benign cyst 5 (2.36%), lipoma 3 (1.42%), galactocele 2 (0.94%) and 1 case of lactating adenoma.

120 females (56.60%) had right breast, 90 (42.45%) had left breast involvement and 2 (0.94%) presented bilaterally. Majority of 77 cases (35.98%) had lumps in upper outer quadrant followed by 72 lumps (33.64%) in upper inner quadrant. Lower outer quadrant was involved in 28 cases (13.08%) and lower inner quadrant in 14 cases (6.54%). 20 cases (9.35%) were found in subareolar region and in 3 cases (1.4%) breast involvement was diffuse. The size of lumps ranged from 1 to 10 cm. Cyto-Histopathology correlation was available in 39 cases of female breast lesions, results of which are summarized in Table 1.

26 male patients presented with lump in mammary region. The cases were aged between 17 to 85 years with mean age 42.88 years. Most of cases 9 (34.62%) were in age group of 20-29 years. 12 cases (46.15%) presented in right mammary region and 14 cases (53.85%) in left mammary region. The cytological spectrum of 26 cases was: Gynaecomastia 22 (84.62%), Malignant 2 (7.69%), Cyst 1 (3.85%) and Lipoma 1 (3.85%).

Among the benign lesions fibroadenoma (82=38.68%) was the most common which on cytology showed the presence of characteristic cytomorphologic features viz presence of cohesive sheets of ductal epithelial cells, fibromyxoid stroma and presence of numerous bare bipolar nuclei in the background. Degenerative changes like presence of cystic macrophages, giant cells and mild anisonucleosis were also noted which are known to occur in fibroadenoma.

We found 36 (16.98%) cases of fibrocystic disease of breast. The characteristic cytological features were presence of apocrine cells, cystic macrophages and bare bipolar cells in the background.

30 cases (14.15%) were of benign breast disease. These diagnosis were made in view of scant cellularity of the aspirate, presence of a haemorrhagic background, cell debris and presence of degenerated epithelial cells.

23 patients were of acute mastitis/breast abscess. Acute mastitis is a bacterial infection and is seen most commonly in the postpartum period. Most of the patients (22) of acute mastitis/abscess were in 20-40 year age group. The cytomorphological features included the presence of neutrophils, macrophages, cytophagocytosis, and cell

debris in the background with occasional epithelial cells forming tight clusters with mild atypia.

4 cases were of granulomatous mastitis. Cytology shows the presence of cellular aspirate having numerous lymphocytes and plasma cells with epithelioid granulomas formed of histiocytes and multinucleated giant cells.

2 cases of fat necrosis, which showed the presence of fat droplets and fragments of adipose tissue along with chronic inflammatory cells.

5 cases were of simple cyst, 3 cases showed complete disappearance of the lump after aspiration of the fluid. Thus, FNAC is a diagnostic as well as therapeutic procedure in these cases. Cytology showed presence of numerous neutrophils and cystic macrophages in two cases. 3 cases showed presence of few apocrine cells along with cystic macrophages.

There was 1 case of lactating adenoma in our study. Lactating adenoma is a benign tumor of breast occurring in pregnancy and post partum period (Choudhary and Singal, 2001). Cytomorphology showed the presence of flat sheets of acinar cells studded with abundant amount of vacuolated cytoplasm.

2 cases of galactoceles, which showed presence of numerous cystic macrophages against a proteinaceous background and a few epithelial cells with vacuolated cytoplasm.

There were three cases of lipomatous swelling. Cytology showed the presence of mature adipose tissue only.

This study had 4 cases (1.89%) suspicious of malignancy. FNA smears contained cells with malignant features in the absence of overtly malignant cells or an aspirate with only scanty number of abnormal cells, or poorly prepared/preserved, but abnormal cells.

We found 20 (9.43%) malignant cases in female breast, among which all were ductal carcinomas. The age ranged from 22 to 67 years with 13 cases between 30-50 years of age. The following features were considered as criteria for malignancy: nuclear atypia such as enlarged nuclei, nuclear pleomorphism and irregular chromatin, presence of necrosis and dissociated cells, irregular overlapping of cells, absence of myoepithelial cells. Presence of necrosis and mucin are important indicators of malignancy.

Histopathological specimens were available in 39 cases. Out of 188 benign cases, histopathology was available for 30 cases. Except 1 case 29 cases were diagnosed benign on histopathology. Out of 4 cases, suspicious of malignancy, 2 histopathology specimen was available and one was diagnosed as Infiltrating Lobular Carcinoma and other as Fibrocystic Disease. Out of 20 cases of malignant lesions, histopathology was available in 7 cases. All the 7 cases were diagnosed as Infiltrating Ductal Carcinoma on histopathology. Thus in the present study, cytological findings were consistent with histopathological findings in 37 cases out of 39 cases (94.87%) and inconsistent in 2 (2.56%) cases. [Table 1]

In our study 26(10.69 %) cases of breast lesions were found in males. Incidence reported by Mansoor *et al.* (2001) is 6% and 7.3% by Das *et al.* (1995).

Gynaecomastia was the predominant benign lesion (22=84.62%) in males in the present study. Studies conducted by Gill *et al.* (2000) (79.3%) and Singh *et al.* (72.27%) also showed gynaecomastia as the predominant benign lesion.

Cytology showed variable amount of cellular material, ranging from moderately cellular smears to highly cellular smears with numerous crowded tissue fragments.

One case was diagnosed as simple cyst, they are distinctly uncommon in male breast. Two cases were reported as malignant. One case was of mucinous carcinoma breast and another as ductal carcinoma. In the mucinous carcinoma, cytology showed abundant mucinous stroma in background with atypical cells seen lying in groups and also arranged linearly showing round to oval nuclei. Male breast cancer is rare as compared to female counterpart. FNAC of the male breast is a reliable diagnostic technique that should be used more often in the preoperative

evaluation of breast masses occurring in males.

Discussion

The fine needle aspiration cytology has achieved great importance in diagnosis and management of palpable breast lesions, as breast is common site for a number of inflammatory, benign and malignant lesions. Breast lesions are easily and early identified due to easy accessibility and early onset of signs and symptoms like swelling (lump) and pain. FNAC helps to distinguish inflammatory and benign lesions from malignant lesions due to simplicity, safety, and diagnostic accuracy, so this procedure has become a widely used diagnostic technique in management of breast lumps (Berner A *et al.*, 2003).

The most common age group in our study was 30-39 years (72=33.96%) followed by 20-29 years (68=32.08). This study is in concordance with Rathi *et al.* (2015) who also reported 30-39 years as the most common age group in their study. Khemka *et al.* (2009) also showed similar age pattern in their study.

In our study majority of breast lumps were in upper outer quadrant (77=35.98%). Khemka *et al.* (2009) and Hussain *et al.* (2005) also observed upper outer quadrant as the commonest site.

In the present study all the lumps were between 1cm to 10 cm. The breast lumps were less than 3 cm in 160 cases. Among the cases which were more than 3cm in size, 38 cases (73.08%) were benign and 14 cases (26.92%) were malignant. Our findings are matched with Ballo *et al.* (1996) who studied 112 cases of breast lumps with a size range of 1-12 cm and reported that 73.8% of the lumps with size more than 2cm and 28.38% with a size less than 2cm were malignant.

Painless breast lump was the most common presenting complaint (170 cases), accounting up to 80.19% in our study. Godwins *et al.* (2011) also observed that the most common presenting complaint was painless breast lump.

In our study among benign lesions, maximum number (82=38.67%) of cases were fibroadenoma. In a study by Rathi *et al.* (2015) (36.1%) and Sankye and Dongre (2014) showed fibroadenoma (46.56 %) as the most common benign breast lesions on cytology.

Most of the patients (22) of acute mastitis/abscess in our study were in 20-40 year age group. Chandanwale *et al.* (2013) also found acute mastitis in similar age group.

In our study 4 cases (1.89%) were suspicious of malignancy. Rehman *et al.* (2013) reported 1.6%, Pradhan and Dhakal (2008) 2.3%, and Ahmed *et al.* (2009) 2.5% of cases to be suspicious of malignancy on cytology which is in concordance with our study.

In our study 20 cases (9.43%) were malignant, Park and Ham (1997) and Rocha *et al.*

Table 1: Showing cytohistopathological correlation

Cytology		Histopathology			
Diagnosis	No. of cases	Fibroade noma	Fibrocys tic Disease	Invasive Ductal Carcinoma	Invasive Lobular Carcinoma
Fibroadenoma	24	24			
Fibrocystic Disease	3		3		
Benign Breast Disease non-specific	2	2			
Suspicious of Malignancy	2		1		1
Malignant	7			7	
Inflammatory	1			1	

(1997) found 12.7 % and 12.0% of cases respectively to be malignant in their studies.

Cyto-Histopathology correlation was available in 39 cases. Cytological findings were consistent with histopathological findings in 37 cases (94.87%) and inconsistent in 2 (5.13%) cases. (Table 1)

Complications

The contradictions to breast FNAC are almost nonexistent. The complication rate is generally quite low and the complications themselves are minor (Ali ZS Parwani AV, 2007).

Complications related to FNAC were not seen in any of the cases in the present study. There were no instances of any visceral, neurovascular or iatrogenic injury in our study. Cytological studies have proved that FNAC is particularly helpful in diagnosis of breast swelling that are suspicious for malignancy.

Summary

FNAC is an essential component in the preoperative management of breast lesions. Preoperative categorization of breast lesions is very important for management of the patient. Its accuracy, affordability, its high sensitivity and specificity in discriminating between inflammatory, benign and malignant lesions, high concordance rates with histopathological diagnosis, rapidity of diagnosis, ease of performance and no complications are factors that cause its popularity.

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