

# MORPHOLOGICAL PATTERNS IN FIBROCYSTIC DISEASE OF BREAST

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## ABSTRACT

One hundred cases of fibrocystic disease of breast were studied at Department of Pathology, King Edward Medical College, Lahore to find out its various morphological patterns. This includes both retrospective (80) and prospective (20) cases. The results are compared with those of other studies. Considering different morphological patterns, cystic dilatation of variable extent of mammary ducts and acini was the commonest feature (97%). Variable degrees of fibrosis was seen in 96% of patients while 34% showed the presence of epitheliosis and 26% apocrine metaplasia. In two cases (2%) myoepithelial hyperplasia, in equal numbers (2%) mucous metaplasia was present. Not a single case showed adenosis. Lymphocytic infiltration of mammary interstitial tissue was present in 41% cases.

## INTRODUCTION

Fibrocystic disease is the most common benign lesion of the female breast occurring during reproductive period of a woman's life<sup>1</sup>. This common disease of breast has been described by various names in the literature e.g., chronic cystic disease, chronic cystic mastitis<sup>2</sup>, mammary dysplasia<sup>3</sup> and many other synonyms. WHO recommends the use of the term Benign Mammary Dysplasia<sup>4</sup>. Fibrocystic disease of breast is a vague term<sup>5</sup> and should be abandoned but it is difficult to think of a better substitute<sup>6</sup> as fibrocystic disease is a broad term that groups together a wide variety of morphological changes in the breast tissue. It may involve only one breast or one quadrant but mostly it is multifocal and in more than fifty percent of the cases bilateral involvement is seen and patients present with multiple lumps<sup>8</sup>. Microscopically several morphological patterns are seen in fibrocystic disease of the breast. Mammary ducts are variably dilated resulting in cyst formation and some element of fibrosis is always present in the stroma<sup>7</sup>. Both ductal and lobular proliferations are present which show atypia in about one third of the patients. Epithelial hyperplasia of the medium sized and smaller ducts and lobules is often accompanied by apocrine metaplasia, cyst formation, sclerosing adenosis and papillomatosis<sup>8</sup>. Mucous metaplasia of the lining

epithelium of the mammary ducts has also been documented in some breasts with fibrocystic disease<sup>9</sup>.

## MATERIALS AND METHODS

A total of 100 cases of fibrocystic disease of breast were included in this study

### Retrospective group:

Routinely fixed and processed paraffin embedded tissue blocks of 80 diagnosed cases of fibrocystic disease of breast were retrieved from the record files of histopathology section, King Edward Medical College, Lahore. Thin tissue sections were cut at 2-3 $\mu$  m thickness and were stained by haematoxylin and eosin. They were examined by light microscope. Gross features were also noted from the record files

### Prospective group:

A total of 20 patients with fibrocystic disease presented with different signs and symptoms of this condition to various surgical units of Mayo Hospital, Lahore, were selected. After clinical evaluation and various baseline laboratory investigations, surgical procedures of variable extent were carried out on these patients and biopsy specimens were sent to the department of pathology, K.E.M.C, Lahore, immersed in 10% formol saline. A thorough gross examination of these biopsy specimens



was done and features were carefully recorded. Tissues were sliced by using a sharp knife. Blocks measuring 3-4 mm were taken and fixed in 10% formal saline for 4-6 hours. After fixation, tissue blocks were processed in an automatic tissue processor through ascending grades of alcohol, cleared in xylene and embedded in paraffin wax. Paraffin blocks of appropriate sizes were made and thin sections of 2-4  $\mu$  m were cut and stained by haematoxylin and eosin. These H & E stained sections were examined by light microscopy.

## RESULTS

Considering the gross examination of these 100 cases, in 53% left breast was involved; whereas right breast involvement was present in 47% of them. In 45% patients, a single lump was present whereas 40% of them had multiple lumps. Cystic swellings were present in 15% of the cases and were visible on slicing these specimens. No case was found to have the involvement of overlying skin. Microscopically the following morphological patterns were seen.



Fig. 1 Fibrocystic disease of the breast. The histological section shows mild cystic change (H&E stain;  $\times 40$ )

### Cyst Formation:

In a total of 100 cases of fibrocystic disease of breast, 97 (97%) showed the presence of cysts (Table 1 and Fig. 1). However, the number and sizes of cysts showed great variations from case to case. Seventy patients (72%) showed mild cystic change (+), 22 (22.7%) showed moderate (++) , whereas in 5 patients (5.2%), cystic change was marked (+++) (Fig. 1). Both ductal and lobular components were involved. In 9 patients (9.2%) both macro and micro cysts were present. In 6 patients (6.2%) cyst wall was infiltrated

with acute as well as chronic inflammatory cellular infiltrate. Duct ectasia was also seen but in a smaller percentage of cases.

### Fibrosis:

Among 100 cases of fibrocystic disease of the breast, 96 patient (96%) showed the present of fibrosis (Table 1). In 70 cases (72.8%) fibrosis was mild (+), 14 cases (14.6%) showed moderate fibrosis (++); whereas in 4 cases (4.2) fibrosis was marked (+++). Mostly fibrosis showed a diffuse pattern but in 13 patients (13.2%), it was more concentrated in periductal areas.

## VARIOUS MORPHOLOGICAL PATTERNS IN FIBROCYSTIC DISEASE OF BREAST

Tot. cases	CYST Formation	HYPERPLASIA			MYOEPI-Hyper	METAPLASIA			FIBROSIS	LYMPHOCYTC INFILT
		Epitheliosis	Papillomatoid hyperplasia	Adenosis		Apocrine	Mucous	Squamous		
100	97	34	Nil	Nil	2	26	2	Nil	96	46
%	97	34	—	—	2	26	2	—	96	46

Table 1. Various Morphological patterns in Fibrocystic disease of Breast

### Lymphocytic Infiltration:

Forty-six percent patients of fibrocystic disease of breast, showed infiltration by lymphocytes in the interstitial tissue. In 38 patients (82.6%) lymphocytic infiltration was mild (+), in 6 patients (13.04%) moderate (++) and in 2 patients (4.3%) it was severe (+++).

### Epitheliosis:

Thirty four patients showed the presence of epitheliosis (Fig. 2). Epitheliosis or papillomatosis was mild (+) in 24 patients (70.6%), moderate (++) in 9 patients (26.4%) and severe (+++) in 1 patient (2.9%). Other types of epithelial hyperplasia, namely papillomatoid hyperplasia and adenosis were not seen in any of these cases of fibrocystic disease of breast. Two of these 100 patients of fibrocystic disease of



breast (2%) showed the presence of myoepithelial hyperplasia.

*Apocrine Metaplasia:*

Apocrine metaplasia of the lining epithelium of cystically dilated mammary ducts and acini was seen in 26 patients (26%). Mucous metaplasia was seen only in 2 patients (2%).

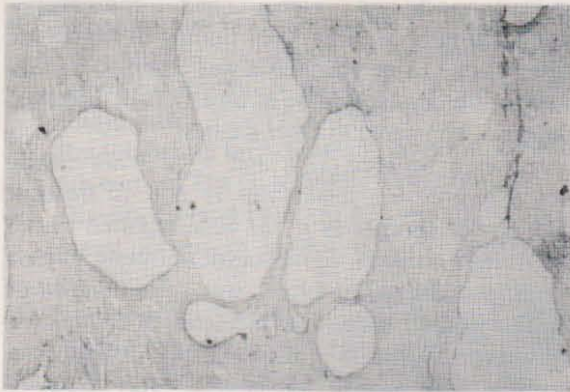


Fig. 2. Moderate cystic change in fibrocystic disease of breast (H&E stain; x 40)



Fig. 3. Duct ectasia in fibrocystic disease of breast (H&E stain x 100)



Fig. 4. Epitheliosis in one mammary duct forming cribriform pattern in fibrocystic disease of breast (H&E, x 200)



Fig. 5. Ductal epitheliosis forming papillary fronds in fibrocystic disease of breast (H&E stain x 400)

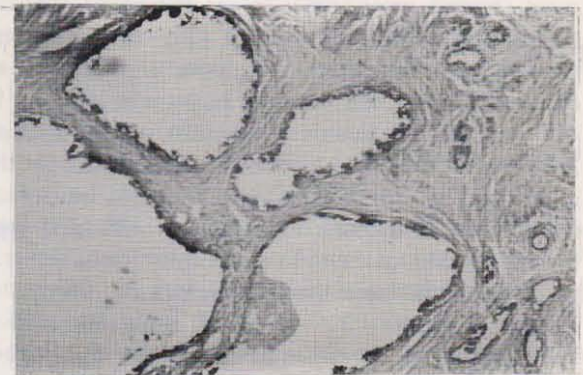


Fig. 6. Dilated ducts showing apocrine metaplasia of the lining epithelium in fibrocystic disease of breast (H&E stain x 100)

In 5 patients (5%) acute inflammatory cellular infiltrate was present resulting in micro abscess formation. Associated intracanalicular variety of fibroadenoma was also present in 5 patients (5%). Two of the patients (2%) showed lactational changes along with fibrocystic change and in another 2 patients (2%) calcification was also present.

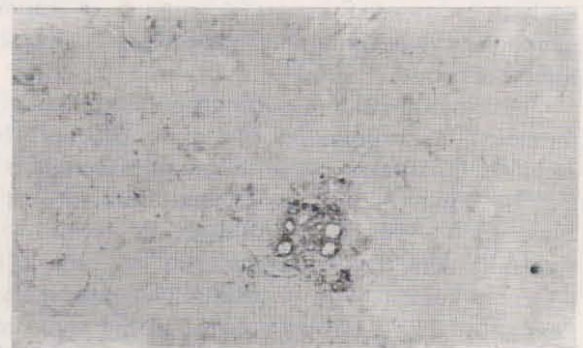


Fig. 7. Fibrosis surrounding an atrophic lobule in fibrocystic disease of breast (H&E stain x 40)



#### Other Associated Findings:

In 5 patients (5%) acute inflammatory cellular infiltrate was present resulting in micro abscess formation. Associated intracanalicular variety of fibroadenoma was also present in 5 patients (5%). Two of the patients (2%) showed lactational changes along with fibrocystic change and in another 2 patients (2%) calcification was also present.

#### DISCUSSION

There is a remarkable degree of variation in the gross and microscopic appearances of fibrocystic disease of breast depending upon which manifestation of the disease predominates<sup>10</sup>. In the present study 53% cases showed involvement of the left breast whereas the right breast was involved in 47% cases and there was no clinical bilateral involvement. Oluwale and Freeman showed that the right breast was involved in 42% patients. The left breast was seen to be involved in 38% and 20% showed bilateral involvement<sup>11</sup>. On the other hand according to Marcuse the right breast was involved in 50% cases, left breast in 42% and both breasts in 8% cases<sup>12</sup>. Vorherr considered bilateral involvement in more than 50% cases of fibrocystic disease of breast<sup>8</sup>. The present study also shows similarity to the other studies i.e. there is a higher incidence of fibrocystic change in the right breast than the left breast. In 45% of our cases, the breast contained a single lump whereas there were multiple lumps in 40% and 15% showed the presence of gross cysts. These findings are similar to most of the previous studies<sup>8, 13, 14</sup>.

Microscopical analysis of fibrocystic disease shows various combinations of separate pathological entities<sup>6</sup> including cysts, apocrine metaplasia, adenosis, sclerosing adenosis, papillomatosis and various degrees of lobular and ductal hyperplasia<sup>15</sup>. For the purpose of analysis we used Symmers description of various morphological patterns or components of fibrocystic disease of breast<sup>3</sup>.

Histologically the most common change was cyst formation. It was present in 97% of our patients. This incidence is definitely higher than most of the studies<sup>16, 17, 18</sup>. However Golinger<sup>19</sup> and Berkowitz and associates<sup>20</sup> showed an incidence of breast cysts similar to ours. The stromal fibrosis was seen to be present in large majority of cases of fibrocystic disease (96%). In 87% it was diffuse and in the remaining 13%, fibrosis was periductal. This is in line with the observation of other workers<sup>3, 7, 21</sup>. Epitheliosis was

present in 34% of our cases. This also includes intraductal papillomatosis. The literature mentions variable figures as regards the incidence of epitheliosis i.e. between 22% and 42%<sup>17, 18, 20</sup>. It was interesting to note that none of our cases showed the feature of adenosis which otherwise is well reported from other regions of the world<sup>16, 18, 20</sup>. Myoepithelial hyperplasia was seen in only 2 patients. Black and his associates<sup>22</sup> showed a very high incidence of myoepithelial hyperplasia whereas Fisher and co-workers<sup>23</sup> mentioned it to be an occasional finding in fibrocystic disease. The apocrine metaplasia was observed in 26% patients of fibrocystic disease of breast. This incidence is quite low compared to other studies<sup>17, 18, 19, 20</sup>. Their figures varied between 37% and 93%. This clearly shows that apocrine metaplasia is not as frequent finding in our patients as it has been reported by the above western workers. Lymphocytic infiltrate in case of fibrocystic disease of breast was seen in 46% of them. Haagensen<sup>18</sup> showed an incidence of 53% in his cases whereas Symmers<sup>3</sup> considered that lymphocytic infiltration was present in almost every case of fibrocystic disease of breast.

This morphological study of fibrocystic disease of breast although carried out in rather smaller number of patients, the interesting features observed were, a very high incidence of cyst formation, a relatively low incidence of epitheliosis and apocrine metaplasia. Adenosis was found to be conspicuously absent in our cases. These findings suggest that a further study on larger number of patients with fibrocystic disease of breast needs to be carried out. This is important because some of the morphological changes in fibrocystic disease of breast act as pre-malignant conditions.

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