Types of Fibrocystic Change — Findings and Treatment

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Fibrocystic breast changes are considered changes that mimic but do not achieve the threshold to be considered malignant conditions of the breast. They are changes that may be seen even in normal breast tissue. They are common in women of childbearing age 30-50 years old who have had hormonal influence by estrogen, progesterone, and prolactin for years. These changes stop after menopause and thus the occurrence of such changes is rare after menopause. The changes are classified into either non-proliferative change such as cystic lesions or proliferative changes without atypia such as epithelial hyperplasia.

**Definition of Fibrocystic Change**

Fibrocystic change is a term that refers to the changes that happen to breast tissue while a woman ages. The normal histologic appearance of predominant ducts, lobules, intra-lobular stroma, and inter-lobular stroma is replaced by fibrous tissue and cystic formation. This is seen in up to 60% of women, hence, the term fibrocystic disease is now abandoned. The incidence of fibrocystic changes peaks in women aged between 40 and 45 years at 430 per 100,000 women.

<table>
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<tr>
<th>Fibrosis</th>
<th>Cystic</th>
<th>Sclerosing adenosis</th>
<th>Epithelial hyperplasia</th>
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Hyperplasia of breast stroma
Fluid-filled, blue dome. Ductal dilation
↑ Acini and intralobular fibrosis. Associated with calcifications
↑ In number of epithelial cell layers in terminal duct lobule
↑ Risk of carcinoma with atypical cells. Occurs in women > 30 years of age

Epidemiology of Fibrocystic Change

Fibrocystic changes are the most frequent benign breast lesion that is encountered in clinical practice. They are seen in women aged 30—50 years and are rare or resolve upon onset of menopause. This distribution suggests that there is an ovarian activity relation that resolves after menopause. The estimated prevalence of fibrocystic changes is 60%.

Causes and Physiology of Fibrocystic Changes

Anatomy and physiology of the breast

The female breast is a large modified sebaceous gland located bilaterally in the chest region. It is an accessory reproductive gland that is tasked with lactation after childbirth. It weighs 200—300 grams during the lactational period.

Anatomically it extends from the 2nd to the 6th rib along the midclavicular line overlying the pectoralis major and serratus anterior muscles and their associated fascia. It is suspended in position by the Cooper’s ligaments. It has a lateral projection known as the axillary tail of Spence. The remaining breast can be divided into four regions by two lines passing through the nipple in both horizontal and vertical outlines. Each of the four regions is known as a quadrant.

The glands structure is made up of 20 % of glandular tissue and 80 % of fat and connective tissue. It has 12—20 lobes each with a single excretory duct known as a lactiferous duct that opens into the nipple. Milk secretion occurs in the columnar-lined alveolus that is surrounded by striated myoepithelial cells which contract during milk secretion process.

Causes and pathogenesis of fibrocystic changes

Hormonal variation and influence during menstruation
Repeated exposure of the breast epithelium to estrogen and progesterone from the ovarian wall leads to accumulation of fluid cells and debris within the breast. This repeated process over the course of several years results in fibrosis and cystic changes of the breast.

Note: Upon onset of menopause, the hormonal trigger is cut off and the breast changes begin to resolve on their own. Other hormones such as prolactin, growth factor and thyroid hormones are thought to also influence the process.
Caffeine has been implicated in the causation of the effects but no evidence documented to support this.
Clinical Features of Fibrocystic Changes

Fibrocystic breast changes present with a variety of clinical findings depending on the level of advancement at presentation and the clinician’s choice of investigation:

- A palpable breast lump by an obstetrician, surgeon or physician may be considered a benign breast change.
- A radiologist may consider dense breast tissue seen/cysts as a form of the process.
- Morphological features of a slide that do not meet the criteria of breast carcinoma may be considered benign breast disease by a radiologist, however, this does not mean they are fibrocystic changes as there are other types of benign breast lesions.

Though they are benign changes, most of the times they attract attention when they acquire features that would be suggestive of malignancy which include:

- Palpable breast lump that may take a various form such as a distinct lump with definite borders, thickening area in the breast tissue, redness, dimpling or pitting of the skin, one breast noted as being larger than the other and nipple changes such as inverted nipples.
- Mammographic densities.
- Mammographic calcifications.
- Spontaneous nipple discharge.

Other findings

Breast pain, mastodynia, and mammalgia is usually cyclic and worsening at the time of menstruation.
Mostly it is a bilateral involvement of a mass or pain that may be worse on one side but soon catches up with the other to become a symmetrical involvement.

Development of the cystic form

1. It begins as small fluid accumulations that coalesce to form larger ones.
2. The cysts may have calcifications that are primary projections into the cysts.
3. Flattened epithelium lines the cysts.

Clinical presentation

Fibrosis occurs on the cysts upon rupture and release of the secretory material into adjacent stroma leading to chronic inflammation and fibrous scarring.
The adenosis variant presents with enlargement of the acini and increases in the number of acini per lobule.

Epithelial hyperplasia

Epithelial hyperplasia is represented by an increase in the number of luminal cell layers that line the normal breast tissue over the basement membrane. In moderate epithelial hyperplasia, there are more than two epithelial layers while in florid epithelial hyperplasia there are more than 4 layers. These cell layers often increase and distend the ducts and lobules.

Sclerosing adenosis
Sclerosing adenosis type has an increase in the number of acini per terminal duct. The acini are compressed and distorted in the central portions but dilated in the peripherals. In addition to this, there is some stromal fibrosis that may completely compress the lumen to create an appearance of solid cords of double strands of cells in the solid stroma.

**Papilloma type**

The papilloma type is composed of multiple branching fibrovascular cores with a connective tissue axis lined by myoepithelial cells. Epithelial hyperplasia and apocrine metaplasia are also common in this type.

**Investigations of Fibrocystic Changes**

**Breast examinations**

*Self-breast examinations* should be done each month after menstruation which is technically 5 days after the last day of menstrual flow. *Breast examination* at the clinician’s office should be done every six months where there is no risk of whenever the patient palpates something suspicious.

**Regular mammographic screening**

Regular mammographic screening is done for all patients who are older and have less dense tissue and have a history of a lesion that may need close monitoring such as a lump or discharge.

**Breast ultrasound**

Breast ultrasound is the alternative of choice for young ladies of reproductive age whom x-rays may pose a risk and have more dense breast tissues that are better viewed using ultrasound method.

**First needle aspiration**

Fine needle aspiration (FNA) it is the next diagnostic or curative test for masses or lumps that are cystic in nature. The fluid is taken for cytology and observation by the histopathologist for analysis. It may be used as a curative method where the fluid in a cyst is drained away.

**Core biopsy and histology**

Core biopsy and histology is considered after inconclusive FNA findings or tissues that may need excision for cure and further evaluation.

**MRI**

Breast MRI is an emerging method of investigation especially in patients who cannot tolerate x-ray beams.

**CT**

CT scan of the chest region is the imaging of choice to rule out advanced malignant processes.
Other laboratory tests (renal function tests and complete blood count) should be done to facilitate the management of the patient i.e. obtaining a baseline function that may be altered by toxic drugs.

**Differential Diagnosis of Fibrocystic Changes**

<table>
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<th>Disease</th>
<th>Description</th>
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<td><strong>Fibroadenoma</strong></td>
<td>A benign tumor of the breast that presents with a hard, discrete mass.</td>
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<tr>
<td><strong>Carcinoma of the breast</strong></td>
<td>Malignant tumor of the breast that presents with discharge/drainage from the breast that may be pus-like/bloody and general signs.</td>
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<td><strong>Mastitis</strong></td>
<td>An infection of the lactational parts of the breast leading to a painful breast that may secrete pus.</td>
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<td><strong>Breast abscess</strong></td>
<td>A focus of infection within the breast marked with an accumulation of pus. Should be differentiated from a cystic lesion of the breast.</td>
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<td><strong>Phyllodes tumor</strong></td>
<td>A type of fibroadenoma that arises from the interlobular stroma.</td>
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**Treatment of Fibrocystic Changes**

Management of the changes is focused on the **hormonal control of the influence via selective estrogen receptor modulators or surgically via hysterectomy**, identification of the onset of malignant changes by biopsies and radiological imaging. Morbidity is due to excessive pain and enlargement of the cystic lesions while mortality mainly arises from malignant transformation of the changes and development of carcinoma of the breast.

**Surgical management**

Due to the close correlation with a symptomatic presentation with carcinoma of the breast, it is prudent to surgically excise the mass for curative purposes and diagnosis with histological examination. It may take the form of **breast-conserving surgery such as mastectomy or radical surgery**. Hysterectomy may also be considered as part of hormonal therapy to cut off the ovarian source of the hormones.

**Medical hormonal therapy**

Oral contraceptive pills are used to control the irregular menstrual cycles. The formation of regular cycles allows for control of hormone-induced changes and recovery of the breast.

**Relief of symptoms**

- Use of analgesics such as acetaminophen to help in pain control.
- Vitamin A, C, and E have shown some benefits in the control of symptoms.
- Drainage of cystic lesions by fine needle aspiration.
- Removal of masses that cause discomfort by surgical excision or mastectomy.
- Use of non-steroidal anti-inflammatory drugs such as ibuprofen to control inflammation and pain on the breast.
- Use of hot or cold compresses to control pain and swelling.
Medical therapy

Use of selective estrogen receptor modulators (SERMs) such as Tamoxifen that selectively inhibit the effect of estrogen on breast tissue but spare other effects of estrogen in the body.

Supportive therapy

Lifestyle modification strategies such as refraining from high salt diet and intake of a diuretic drug at the end of every monthly cycle to control the breast swelling with each menstrual cycle. Avoid contact sports that could impact on breasts and induce further swelling. Use of well supportive bra of good quality for the comfort of the patient.

Complications of Fibrocystic Changes

Complications associated with fibrocystic breast changes can arise from the progression of the lesions or problems associated with treatment:

- Infections may arise with the use of invasive methods of treatment such as fine needle aspiration or open surgery. It may also occur with the accumulation of cystic fluid in the breast tissue for prolonged periods and overgrowth of bacterial organisms.
- The benign breast changes may evolve into full-blown carcinoma of the breast if excision or hormonal therapy does not arrest the progress.
- Cosmetic blemish may arise from excessive enlargement of breast tissues.

Course and Prognosis of Fibrocystic Changes

The changes generally run a predictable course and respond to any form of treatment whether surgical or medical. Morbidity mainly comes from excessive pain from the gland and formation of large cysts that would require intervention.

Most of the cases heal spontaneously after menopause.

The most feared complication and the most common cause of mortality are the development of carcinoma of the breast. The condition is more common and feared among patients with benign fibrocystic breast changes since it is more difficult to detect in this group of patients.

References


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