Pathology & Presentation of Benign Breast Disease
Zdenek Dubrava - February 2006
Presentation

- Lump
- Pain
- Nipple Discharge
- Breast Shape/Size
<table>
<thead>
<tr>
<th>Discrete solitary lump</th>
<th>Age &lt;30 yr</th>
<th>Most common lesion: fibroadenoma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm, rubbery lump</td>
<td>Age 30–50 yr</td>
<td>Most common lesions: fibroadenoma, cyst, fibrocystic changes, usual ductal hyperplasia, atypical ductal hyperplasia, atypical lobular hyperplasia†</td>
</tr>
<tr>
<td>Firm, discrete lump</td>
<td>Age &gt;50 yr</td>
<td>Most common lesions: cyst, ductal carcinoma in situ, invasive cancer</td>
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<tr>
<td>Diffuse lumpiness (“lumpy-bumpy”)</td>
<td></td>
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<tr>
<td>Absence of discrete lump</td>
<td></td>
<td>Fibrocystic changes</td>
</tr>
</tbody>
</table>

**Table 2. Common Benign Breast Disorders in Women.**

<table>
<thead>
<tr>
<th>Type</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast pain</td>
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<tr>
<td>Cyclic pain</td>
<td>Hormonal stimulation of normal breast lobules before menses</td>
</tr>
<tr>
<td>Noncyclic pain</td>
<td>Stretching of Cooper's ligaments</td>
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<td></td>
<td>Pressure from brassiere</td>
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<td></td>
<td>Fat necrosis from trauma</td>
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<tr>
<td></td>
<td>Hidradenitis suppurativa</td>
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<tr>
<td></td>
<td>Focal mastitis</td>
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<tr>
<td></td>
<td>Periductal mastitis</td>
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<tr>
<td></td>
<td>Cyst</td>
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<td></td>
<td>Mondor's disease (sclerosing phlebitis of breast veins)</td>
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<tr>
<td>Nonbreast pain</td>
<td></td>
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<tr>
<td>Chest-wall pain</td>
<td>Tietze's syndrome (costochondritis)</td>
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<tr>
<td></td>
<td>Localized lateral chest-wall pain</td>
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<tr>
<td></td>
<td>Diffuse lateral chest-wall pain</td>
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<tr>
<td></td>
<td>Radicular pain from cervical arthritis</td>
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<tr>
<td>Non–chest-wall pain</td>
<td>Gallbladder disease</td>
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<tr>
<td></td>
<td>Ischemic heart disease</td>
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<tr>
<td>Nipple discharge</td>
<td>Presence of galactorrhea</td>
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<tr>
<td></td>
<td>Hyperprolactinemia from pituitary tumor, hypothyroidism, drugs†</td>
</tr>
<tr>
<td>Presence of galactorrhea</td>
<td>From multiple ducts bilaterally</td>
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</tr>
</tbody>
</table>
ANDI Aberrations of normal development and involution, Hughes 2000

Benign disorders are related to the normal processes of reproductive life.
The spectrum ranges from normal to aberration to disease
The ANDI concept is a unifying concept – of symptoms, signs, histology and physiology

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Aberration</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Early Reproductive Years</strong> (age 15-25)</td>
<td>Lobular/Stromal development</td>
<td>Fibroadenoma Adolescent Hypertrophy</td>
<td>Giant/multiple Fibroadenoma</td>
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<tr>
<td></td>
<td>Nipple eversion</td>
<td>Nipple inversion</td>
<td>Subareolar abscess</td>
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<td></td>
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<td>Mammary duct fistula</td>
</tr>
<tr>
<td><strong>Later Reproductive Years</strong> (age 25-40)</td>
<td>Cyclical changes</td>
<td>Cyclical Mastalgia</td>
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<tr>
<td></td>
<td>Hyperplasia of pregnancy</td>
<td>Nodularity/Fibrocystic change/Sclerosing Adenosis</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Bloody nipple discharge</td>
<td></td>
</tr>
<tr>
<td><strong>Involution</strong> (age 35-55)</td>
<td>Duct dilatation/sclerosis</td>
<td>Macrocysts Sclerosing lesions Duct ectasia Nipple retraction</td>
<td>Periductal Mastitis</td>
</tr>
<tr>
<td></td>
<td>Epithelial turnover</td>
<td>Epithelial hyperplasia</td>
<td>Epithelial hyperplasia with atypia</td>
</tr>
</tbody>
</table>
Fibrocystic Change

• Synonyms: Fibroadenosis, chronic mastitis, cystic hyperplasia, benign mammary dysplasia
• Lumpy-Bumpy breasts
• Hormone related (between menarche and menopause
• Unilateral or bilateral
• Premenstrual pain and swelling, settle after period
• Nipple discharge (various colours, mainly green-grey)
• A: Fibrocystic change
• B: Lobular hyperplasia without atypia (adenosis)
• C: Ductal hyperplasia without atypia
• D: Florid ductal hyperplasia without atypia
• E: Ductal hyperplasia with atypia [secondary lumens, hyperchromasia]
• F: Lobular hyperplasia with atypia [distended acini, monotonous cells]
Relationship between benign and malignant breast disease

• **No increased risk**
  - Adenosis
  - Duct ectasia
  - Mild hyperplasia
  - Fibroadenoma
  - Cysts
  - Apocrine change
  - Apocrine metaplasia

• **Slight increased risk (1.5 to 2 times)**
  - Moderate or florid hyperplasia
  - Papilloma with fibro vascular core

• **Moderate increased risk (4 to 5 times)**
  - Atypical ductal hyperplasia
  - Atypical lobular hyperplasia

• **High risk (8 to 10 times)**
  - Ductal carcinoma *in-situ*
  - Lobular carcinoma *in-situ*
Age Incidence of lumps in the breast
Fibroadenoma

- Fibroadenomas are derived from the breast lobule, pathogenesis is unclear
- They have both epithelial and connective tissue elements, therefore can undergo hormonally induced changes as in the rest of the breast.
- They are not true neoplasms being polyclonal rather than monoclonal
- The mass is composed of a proliferation of attenuated ducts in a loose, myxoid connective tissue.
- Compress the surrounding breast.
Fibroadenoma

- Freely mobile and smooth (breast mouse)
- Usually 2-3 cm in diameter
- Usually young women
- Decrease incidence approaching the menopause
- May present has 'hard' calcified mass in the elderly
- Approximately 10% of fibroadenomas are multiple
- Half of adenomas resolve if <3cm over 5yrs
- Adenomas >4cm should be excised (exclude phyllodes tumor)
Fibroadenoma
Fibroadenoma
Fibroadenoma

• Giant fibroadenoma
  Can be defined as > 5cm
  Bimodal age presentation - teens & premenopausal
  Rapidly grow to a large size
  Present with pain, breast distortion
  No evidence that these tumours recur

• Phyllodes tumour
  Occur in premenopausal women
  Wide spectrum of activity
  Benign to locally aggressive
  Have cellular fibrous element
  Is a separate entity to fibroadenoma
Breast Cysts

- 7% of women will develop a clinically palpable cyst
- Usually occurs in perimenopausal women
- Due to relative excess oestrogen, usually in 4-5\textsuperscript{th} decades
- Fluctuate with menses
- Highest prevalence is 45-55 years
- 50% of these are solitary, 30% have 2-5 cysts and the rest more than 5 cysts
- May appear suddenly and are frequently painful

Types of breast cysts:

Apocrine
- Are lined by secretory epithelium (Na : K < 3)
- Likely to have more than 5 cysts
- 5 times likely to develop further cysts

Flattened
- Lined by less active epithelium. (Na : K ratio = greater than 3)
- Fluid resembles plasma
Breast Cysts

- Beware of carcinoma if:
  - The aspirate is blood stained
  - There is a residual mass
  - There is a persistent density in the Mammogram after cyst aspiration
  - The cyst recurs on 3 occasions after aspiration
  - The carcinoma is likely to be a composite of solid and cystic areas
  - Intracystic carcinomas are rare (0.1%)
Pain

**Cyclical mastalgia**
Young women  
Incidence: 58% mild discomfort, 11% mod-severe pain  
Usually bilateral, affects upper outer quadrant  
No consistent hormonal abnormality  
Premenstrual  
Resolves at the onset of menses  
No definite link with caffeine, fat intake, psychological factors

**Non cyclical mastalgia**
- True (breast related): usually unilateral, localized  
  - Enlarging cyst, ruptured ectatic duct, mastitis  
  - Mondor’s Disease: thrombophlebitis,  
    spontaneous or following breast augment
- Musculoskeletal : costochondral *(Tietze’s syndrome)*, lateral chest wall
**Pain**

**Infection**
- Lactational infections
  - Due to cracks in nipple
  - Usually peripheral
  - Usually Staph. aureus

- Nonlactational infections
  - Central
    - Occur in periareolar tissue
    - Usually manifestation of mammary duct ectasia
  - Peripheral: associated with diabetes, rheumatoid arthritis, steroid usage, trauma etc.
  - Rare: Tuberculosis, Granulomatous mastitis, Diabetic (lymphocytic) mastitis, etc.
  - Skin associated: intertrigo, infected sebaceous cyst, hidradenitis suppurativa etc.
Mammary Duct Ectasia

- Synonyms: periductal mastitis, plasma cell mastitis
- Women during or after menopause
- More common in smokers
- Caused by ducts beneath the nipples becoming dilated or clogged with fatty material
- Firm, tender, poorly defined swelling near the areola
- Whole breast quadrant may be involved.
- Nipple inversion results from traction on the nipple by ducts that have undergone fibrosis in about 30% to 40% of cases
- Toothpaste like nipple discharge.
- Pathogenesis not clear but the primary event seems to be periductal inflammation and duct ectasia is the ultimate outcome.
- Both aerobic and anaerobic bacteria involved.
- May be troublesome condition with recurrent abscesses and fistula formation
Mammary Duct Ectasia

- Duct contains foamy histiocytes and the periductal tissue is infiltrated by lymphocytes.
Mammary Duct Ectasia

- Fistula formation and scarring
Nipple Discharge

Description of nipple discharge
Unilateral or bilateral
Single or multiple ducts
Colour
Blood-stained
Spontaneous or expressed

Single duct bloody discharge
Nipple Discharge

Discharge can be elicited in approximately 20% of women by squeezing.

70% of cases of blood-stained discharge have either a duct papilloma or breast cancer.

**Unilateral**
Breast Cancer:
esp. if spontaneous, single duct, blood stained

Duct papilloma

**Bilateral**
Galactorrhoea
- Mechanical stimulation
- Hyperprolactinaemia (Pituitary tumour, Drugs eg. Haloperidol, Neonatal)

Duct ectasia
Usually bilateral, multiduct, creamy or opalescent in colour, intermittent and occurring in late reproductive life
Gynaecomastia

- **Aetiology**
  - Most cases are idiopathic
  - Physiological causes are due to relative oestrogen excess
  - Physiological causes
    - Neonatal
    - Puberty
    - Senile
  - Pathological causes
    - Primary Testicular Failure
      - Anorchia
      - Klinefelter's Syndrome
      - Bilateral Cryptorchidism
      - Acquired Testicular Failure
      - Mumps
      - Irradiation
    - Secondary Testicular Failure
      - Generalised hypopituitarism
      - Isolated gonadotrophin deficiency
    - Endocrine Tumours
      - Testicular
      - Adrenal
      - Pituitary
    - Non-Endocrine Tumours
      - Bronchial carcinoma
      - Lymphoma
      - Hypernephroma
    - Hepatic Disease
      - Cirrhosis
      - Haemochromatosis
    - Drugs
      - Oestrogens and oestrogen agonists - digoxin, spironolactone
      - Hyperprolactinaemia - methyl/dopa, phenothiazines
      - Gonadotrophins
      - Testosterone target cell inhibitors - cimetidine, cyproterone Acetate
References

• Mr. Stephen Parker, Surgical-tutor.org.uk, Postgraduate revision notes 2005.
END