Fibroepithelial Lesions of the Breast

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Virginia Mason Medical Center
Seattle, WA

Fibroepithelial Lesions

- Fibroadenoma
- Phyllodes tumor
  - Features
  - Categorization
  - Prognosis
- Differential diagnoses
  - Phyllodes vs. fibroadenoma
  - Spindle cell lesions
- CNB management

Biphasic: Origin in Terminal Duct Lobular Unit
Fibroadenomatous Change

Fibroadenoma
Patterns

- Intra- and/or pericanalicular
- May contain fat, smooth muscle
- May infarct or sclerose
- May be myxoid

None clinically significant
Fibroadenoma: Intracanalicular Pattern

Fibroadenoma, pericanalicular pattern

Fibroadenoma, sclerosed

Fibroadenoma, myxoid

Fibroadenoma Terminology

- Complex
  (>3mm, sclerosing adenosis, epithelial calcifications, papillary apocrine change)
- Juvenile
  (More rapid growth, cellular stroma, epithelial proliferation)
- Giant
- Cellular

None clinically significant
Don't confuse with Phyllodes
Phyllodes Tumor

Key Facts

- Uncommon tumors!
- 0.3-1% in tertiary referral centers
- Less in community based (≤0.5%)
- 2.5% of all fibroepithelial tumors
- Most behave in benign fashion
- Recur if incompletely excised

Age at presentation
- Average 40-50yrs (range 10-80yrs)
- 15-20 yrs older than FA

Size
- 1.3 to >10cm (average 4-5cm)
- Impact of screening → smaller size

Usually well circumscribed
- Imaging similar to fibroadenoma
- None of use versus fibroadenoma
Phyllodes Tumor
Classic Histology
• Cellular stroma
• Clefts or cyst-like spaces lined by epithelium
• Leaf-like projections of cellular stroma lined by epithelium protrude into these spaces
Phyllodes Tumor

Benign  Malignant

vs. Fibroadenoma  vs. Sarcoma

Phyllodes Tumor – Benign
Phyllodes Tumor - Malignant
Phyllodes Tumor
Histologic Caveats

- **Stromal cellularity**
  - May have less cellular FA-like foci
  - Often denser adjacent to epithelium

- **Leaf-like pattern**
  - FA may have (but often “jig-saw” like)
  - Less does not preclude phyllodes

- **Mitoses**
  - Benign phyllodes minimal
  - FA – up to 2/10HPF okay

- **Infiltrative edge**
  - Often subtle in benign phyllodes

Phyllodes: Stromal Heterogeneity
Phyllodes Tumor: obviously infiltrative

Phyllodes: subtle infiltrative edge
Phyllodes Tumor
Histologic Categories

Attempt to predict clinical behavior:
- Local recurrence
- Metastasis
**Phyllodes Tumor**

**Histologic Categories**

- **2 tier**
  - Low grade, High grade
    (Malignant connotation even for benign)

- **3 tier**
  - Benign, low & high grade malignant
    (Biased toward malignant spectrum)
  - Benign, Borderline, Malignant
    (Most clinically relevant)

**Phyllodes Tumor Categories**

<table>
<thead>
<tr>
<th>Benign</th>
<th>Borderline</th>
<th>Malignant</th>
</tr>
</thead>
</table>

**Multiple Parameters**

- Stromal cellularity
- Pleomorphism
- Mitoses
- Tumor border
- Stromal overgrowth (@ 40x, 10x4)
- Heterologous sarcomatous elements (e.g. liposarcoma)

**Phyllodes: cellular stroma, pleomorphic**
Phyllodes: marked infiltrative edge

Stromal overgrowth

Stroma Only
One LPF
40x (4x10)
Heterologous Sarcoma = Malignant
Phyllodes Tumor Categories

<table>
<thead>
<tr>
<th></th>
<th>Benign</th>
<th>Borderline</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td>vs. other tumors</td>
<td>Uncommon</td>
<td>Rare</td>
<td>Rare</td>
</tr>
<tr>
<td>Cellularity</td>
<td>Mild</td>
<td>Mod</td>
<td>Marked Diffuse</td>
</tr>
<tr>
<td></td>
<td>Non-uniform or diffuse</td>
<td>Non-uniform or diffuse</td>
<td>Diffuse</td>
</tr>
<tr>
<td>Pleomorphism</td>
<td>Mild or none</td>
<td>Mild or mod</td>
<td>Marked</td>
</tr>
<tr>
<td>Mitoses/10 HPF</td>
<td>Low (&lt;5)</td>
<td>Mod (5-9)</td>
<td>High (≥10)</td>
</tr>
<tr>
<td>Border</td>
<td>Well-defined</td>
<td>Variable</td>
<td>Permeative</td>
</tr>
<tr>
<td>Stromal Overgrowth</td>
<td>Absent</td>
<td>Absent or focal</td>
<td>Often</td>
</tr>
<tr>
<td>Malignant Heterologous</td>
<td>No</td>
<td>No</td>
<td>Diagnostic</td>
</tr>
</tbody>
</table>

Adapted from Elston & Ellis 1998 and WHO 2012

Phyllodes Histologic Categories

Issues

• Exact weighting of each feature?
• Features semiquantitative and subjective
• Even mitoses/10hpf debated
  e.g. Benign: Kleer <1, Rosen, Tan ≤2, Pietruszka ≤4, Moffat <10; but Fibroadenoma up to 2/10HPF OK!
• Most reproducible: stromal overgrowth, infiltrative edge
Phyllodes Histologic Categories
What to do?
• Use constellation of features
• Err toward benign spectrum
• Malignant usually obvious
• Borderline vs. benign distinction may be gray in some cases
  (More prudent: “phyllodes tumor”, with note listing features)

Phyllodes Tumor
Prognosis
• Older studies equated local recurrence with malignancy
  (Treves 1951; Lester 1954)
• But, potential of a tumor to metastasize = malignancy
• Phyllodes tumors often recur, but majority do not develop metastases…

Phyllodes Tumor
Metastatic Potential
• Most are benign
• Even malignant have <22% mets
  (Borderline 0 to <4%, benign 0)
• Usually stromal component
• Lung, pleura, bone
• Nodal mets rare (no ALND)
• Predictors: truly sarcomatous (esp heterologous), stromal overgrowth
Phyllodes tumor
Local Recurrence

• Up to 60% recurrence reported
• But limitations of studies:
  – All retrospective
  – Relatively small numbers
  – Most tertiary referral centers
  – Variety of classifications
  – Univariate analysis

RECURRENT CYSTOSARCOMA PHYLOides
A Clinicopathologic Study of 32 Cases
STEVEN I. HAJDU, MD,* MANUEL H. ESPIÑOZA, MD, and GUY F. ROBBINS, MD

A retrospective study was made of recurrent mammary cystosarcoma phylloides seen at Memorial Sloan-Kettering Cancer Center from 1952 to 1972. Clinicopathologic findings, clinical course, treatment, and survival are described. It is apparent that cystosarcomas may recur a few years may elapse between recurrences. From them, we found that 10% of the benign and 8% of the malignant cystosarcoma recurred and malignant "transformation" occurred in one of the 28 recurrent benign cystosarcomas.


• 40 yrs, 32 recurrences
• 28 (18%) of 150 benign
• 4 (8%) of 49 malignant
• Majority incompletely excised
• Recurred 2 yrs average (up to 28)
• Community-based study
• 3 tier (benign, borderline, malignant)
• All 7 recurrences had positive margins (6/23 benign, 1/5 malignant)
• None with negative margin recurred (10 benign, all 4 borderline)

• 216 cases, 118 mo follow-up
• Surgery varied (enucleation, resection, mastectomy)
• Recurrence (related to margin width)
  – Benign 11/140 (8%) at 32 mo
  – Borderline 9/46 (20%) at 18 mo
  – Malignant 7/30 (23%) at 22 mo
• ?? Suggest “wait and see” for benign

• 335 cases, 43 (13%) recurred:
  – Benign 25/250 (10%)
  – Borderline 11/54 (21%)
  – Malignant 7/31 (23%)
• Many histologic features → Margins predictive on multivariate (also PASH)
• Clear margins reduced recurrence risk by 52%
Predicting clinical behavior of breast phyllodes tumors: a nomogram based on histological criteria and surgical margins

Pang Hien Tan,1 Ann Aye Thike,1 Eth Lin Tan,1 Min Min Myint,1 Thu,1
Kwee Boon Mans,1 Huynh Li,2 Wan Yee Chew,3 Min Han Tan,4 The Phyllodes Tumor Network Singapore5

- 605 PT (440 Bn, 111 bord, 54 malig)
- Histologic features (Stromal cellularity, atypia, mitoses, overgrowth, tumor border)
- Margins: negative = "rim of normal"
- Median follow-up 56.9 mo
- Majority of recurrence local
- Only 7 mets (all malignant PT)

Phyllodes tumor
Local Recurrence

- Strongest predictor of recurrence = Adequacy of excision
- Regardless of histologic category (benign, borderline, malignant)
- Aside from tumor not at ink, problem defining “negative” (prudent: rim of normal tissue)

The Borderline Category

• Very low chance of metastasis <<4%
  Some studies 0% (e.g. Barth 1999, Tan 2012)
• Recurrence risk similar to benign if adequately excised (many studies)
• Some cases - gray zone between benign and borderline (best: phyllodes tumor with note, features)
• Role? “to prevent overdiagnosis of malignancy” in cases at minimal risk of metastasis (Carter, Page 2004)

Marker Studies

• Many markers, many papers: Ki67, p53, c-Kit, p53, CD34, FVIII, S-phase, MVD…
• Most correlate very well with histologic category (and malignancy)
• Do not independently predict outcome (recurrence, mets)

Fibroepithelial Lesions: Differential Diagnosis

• Phyllodes vs. fibroadenoma
• Phyllodes vs. other spindle cell lesions
• Periductal stromal tumor
Fibroepithelial Lesions: Differential Diagnosis

- Phyllodes vs. fibroadenoma

Distinction important due to recurrence risk of phyllodes tumor if incompletely excised

Benign Phyllodes vs. Fibroadenoma

Key Features

- Stroma more cellular and closely packed
- Basic leaf/cleft-like pattern (but not mandatory)
- ± Indistinct edge
- Constellation of features

“Cellular” Fibroadenoma
Phyllodes Tumor
### Additional useful features

**Phyllodes**
- Edge indistinct in part (often subtle)
- LP: disorderly distribution of stoma & epithelium
- Leaves protrude into ill-fitting, irregular cystic spaces
- Stroma often enhanced under epithelium

**Fibroadenoma**
- Circumscribed, pushing edge
- LP: orderly distribution of stroma & epithelium
- “Leaves” fit together nicely (like jigsaw puzzle)
- Minimal stromal enhancement

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### Phyllodes & Fibroadenoma

- FA-like areas in some phyllodes
- Earlier studies postulated FA was precursor *Treves 1951, Lester 1954, Norris 1967*
- Molecular studies suggest phyllodes stroma monoclonal, but most FA polyclonal (rarely clonal) *Noguchi 1993/1995, Kuijper 2002*
- Relationship remains unclear

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### Phyllodes & Fibroadenoma

- Heterogeneity assists diagnosis
- Multiple sections of excision
- Margins - all important
- CNB sampling issues
Phyllodes with FA like areas
"Juvenile" Fibroadenoma

Adolescents
Increased stromal cellularity
Mitoses
May be large

Pericanalicular pattern
Ductal hyperplasia (gynecomastoid)
Circumscribed, orderly

Don't over-diagnose as phyllodes!

Ross, et al. Mod Pathol. 2012 (Abstract 254)
Phyllodes Tumor vs. Metaplastic Carcinoma, Fibromatosis

Case: Spindle cell lesion in skin biopsy
Diagnosis: Malignant phyllodes involving skin
Lesson: sample extensively!

Phyllodes Tumor vs. Metaplastic Carcinoma, Fibromatosis
Immunohistochemistry Issues
An Immunohistochemical Study of Metaplastic Spindle Cell Carcinoma, Phyllodes Tumor and Fibromatosis of the Breast

BARBARA DUNNE, MRCPath, ANDREW H. S. LEE, MRCPath, MRCPath,
SARAH E. PINDER, FRCPath, JANE A. BELL, FRCPath,
AND IAN C. ELLIS, FRCPath

HUM PATHOL. 54:1009-1015. 2003

All Phyllodes and Fibromatosis cytokeratin negative

<table>
<thead>
<tr>
<th>Staining</th>
<th>Metastatic carcinoma (n = 18)</th>
<th>Phyllodes tumour (n = 20)</th>
<th>Pos Cells/case</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD34</td>
<td>0</td>
<td>18</td>
<td>&lt;0.0001 0</td>
</tr>
<tr>
<td>Br-12</td>
<td>2</td>
<td>12</td>
<td>0.02 0</td>
</tr>
<tr>
<td>SMA</td>
<td>10</td>
<td>17</td>
<td>0.54 5</td>
</tr>
<tr>
<td>S100</td>
<td>10</td>
<td>3</td>
<td>0.002 0</td>
</tr>
<tr>
<td>CD31</td>
<td>1</td>
<td>0</td>
<td>0.41 0</td>
</tr>
<tr>
<td>Desmin</td>
<td>3</td>
<td>3</td>
<td>0.66 1</td>
</tr>
<tr>
<td>Vimentin</td>
<td>17</td>
<td>26</td>
<td>0.41 7</td>
</tr>
</tbody>
</table>

All Phyllodes and Fibromatosis cytokeratin negative

CD34 Immunostaining in Spindle Cell Lesions

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>N</th>
<th>Positive cases</th>
<th>Pos Cells/case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibroadenoma</td>
<td>23</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Phyllodes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benign</td>
<td>77</td>
<td>95%</td>
<td>50%</td>
</tr>
<tr>
<td>Borderline</td>
<td>46</td>
<td>100%</td>
<td>70%</td>
</tr>
<tr>
<td>Malignant</td>
<td>12</td>
<td>92%</td>
<td>50%</td>
</tr>
<tr>
<td>Fibromatosis</td>
<td>19</td>
<td>84%</td>
<td>10%</td>
</tr>
<tr>
<td>Metaplastic CA</td>
<td>36</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Adapted from: Lee, Histopathology 2008;52:45; Table 1, data from:

Nuclear β-Catenin

- 80% of fibromatosis positive
- Some metaplastic CAs positive
- Some fibroadenomas and phyllodes also positive
  - Mechanism differs vs fibromatosis
  - No β-catenin gene (CTNNB1) mutations
  - APC mutations rare
  - Other, e.g. epithelial Wnt5a overexpression
    stromal overexpression of Wnt2, IGFs

Abraham, Hum Pathol 2002;33:39; Sawyer, J Pathol 2002;196:437
Sawyer, J Pathol 2005;206:637; Laureza-Tlinky Med Pathol 2010;23:1438
Tsang, Histopathology 2012;61:667
**β-catenin/Wnt signalling pathway in fibromatosis, metaplastic carcinomas and phyllodes tumours of the breast**

<table>
<thead>
<tr>
<th></th>
<th>Nuc β-Catenin Pos*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibromatosis</td>
<td>8/8 (100%)</td>
</tr>
<tr>
<td>Metaplastic CA</td>
<td>12/52 (23%)</td>
</tr>
<tr>
<td>Phyllodes tumor</td>
<td></td>
</tr>
<tr>
<td>Benign</td>
<td>19/23 (83%)</td>
</tr>
<tr>
<td>Borderline/Malignant</td>
<td>15/16 (94%)</td>
</tr>
<tr>
<td></td>
<td>4/7 (57%)</td>
</tr>
</tbody>
</table>

* Allred score >2
CTNNB1 mut: 3/3 fibromatosis, 0/21 met CA

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**Histopathology**

Involvement of α- and β-catenins and E-cadherin in the development of mammary phyllodes tumours

John T. S. Tanng,1 Paula Manoonw,2 Christopher C F Lam1,3,4,13 Hui H C Yu,4,1 Thomas C Patti2

1Department of Anatomical and Cellular Pathology, The Chinese University of Hong Kong, Hong Kong; 2Department of Pathology, National University of Singapore, Singapore; 3Tumor Pathology and Diagnosis Service, Royal North Alfred Hospital, The University of Sydney, Sydney, NSW, Australia; 4Department of Anatomical Pathology, Royal Hospital, The University of Hong Kong, Sydney, NSW, Australia, and Department of Pathology, Singapore General Hospital, Singapore

- 158 Phyllodes
- Nuclear β-catenin positivity (% and intensity scale)
  - Benign: 38%
  - Borderline: 52%
  - Malignant: 30%

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Stromal keratin expression in phyllodes tumours of the breast: a comparison with other spindle cell breast lesions

Yilang Chen,1 Ayy Aye Than,1 Fuh Yen Chew,1 Luke Yong Zheng Chang,1 Gary Man-Ki Tai,2 Fuy Hiong Tan1


- 109 Phyllodes tumors
  (70 benign, 30 borderline, 9 malignant)
- 1-5% stromal cells focally pos for CK
- # Cases CK pos:
  CK7: 28%, 34βE12: 22%, MNF116: 12%, AE1/3: 8%, CK14: 2%, Cam5.2: 2%
- No p63 staining
Chia et al. 2012

- All metaplastic CA pos for ≥2 CK up to 90% of cells; 25% p63 pos

- No Fibromatosis or DFSP CK pos

- Caution: Limited samples (e.g. CNB)
Spindle Cell Lesions
Marker Studies

<table>
<thead>
<tr>
<th></th>
<th>CK</th>
<th>CD34</th>
<th>β-Catenin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibromatosis</td>
<td>Neg</td>
<td>Neg</td>
<td>Most Pos</td>
</tr>
<tr>
<td>Metaplastic Carcinoma</td>
<td>Pos</td>
<td>Neg</td>
<td>May be Pos</td>
</tr>
<tr>
<td>Phyllodes</td>
<td>Neg</td>
<td>Most</td>
<td>May be Pos</td>
</tr>
</tbody>
</table>

Beware: limited (CNB) only stroma

Periductal Stromal Tumor

- Overlap with phyllodes, but differs:
  - Non-circumscribed
  - Absence of leaf-like growth
  - Spindle cell proliferation around open tubules
- CD34 positive, negative for keratin
- “Tumor” preferred to “sarcoma”
- Progression to phyllodes reported (spectrum or variant?)

Fibroepithelial Lesions on Core Needle Biopsy

Management Issues

Fibroadenoma on CNB
Fibroadenoma on CNB

- Readily diagnosed
- Safely observed, if
  - Adequate radiology-pathology correlation
  - No other lesion for which surgical excision indicated e.g. ADH, FEA

Surgical Excision
Fibroepithelial Lesions with Cellular Stroma (FELCS) on CNB

Differential Diagnosis

- Fibroadenoma
- Phyllodes

FELCS on CNB

Phyllodes Tumor

Fibroadenoma
Cellular Fibroepithelial Lesions on CNB with Excision Outcome

<table>
<thead>
<tr>
<th>Study</th>
<th>Number</th>
<th>PT at Excision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dershaw 1996</td>
<td>7</td>
<td>3 (43%)</td>
</tr>
<tr>
<td>Meyer 1997</td>
<td>9</td>
<td>2 (22%)</td>
</tr>
<tr>
<td>Komenaka 2003</td>
<td>57</td>
<td>25 (44%)</td>
</tr>
<tr>
<td>Jacobs 2005</td>
<td>29</td>
<td>12 (41%)</td>
</tr>
<tr>
<td>Dillon 2006</td>
<td>35</td>
<td>12 (34%)</td>
</tr>
<tr>
<td>Lee 2007</td>
<td>74</td>
<td>36 (49%)</td>
</tr>
<tr>
<td>Jara-Lazaro 2010</td>
<td>57</td>
<td>36 (63%)</td>
</tr>
<tr>
<td>Tsang 2011</td>
<td>118</td>
<td>49 (42%)</td>
</tr>
</tbody>
</table>

Histologic criteria analyzed on CNB

Cellular Fibroepithelial Lesions on CNB with Excision Outcome
Different Approaches

- CNB Cellular FEL → Excision outcome
  - Jacobs 2005
  - Jara-Lazaro 2010

- Excision PT or FA → Prior CNB features
  - Lee 2007
  - Tsang 2011

Fibroepithelial Lesions With Cellular Stroma on Breast Core Needle Biopsy

Are There Predictors of Outcome on Surgical Excision?
Timothy W. Jacobs, MD; Yenn-W W. Chen, MD, PhD; Donald G. Guinee, Jr, MD; Joseph A. Habib, MD; Imad Che, MD; Donald E. Bauerman, MD; Beverly Kashiwagi, MD; Dales W. Bowers, Jr, and Grade Harary, MD


- 29 cases of FELCS on CNB
- All excised: 16 Fibroadenomas
  - 12 Phyllodes tumors
    - (5 benign, 6 borderline, 1 malig)
FELCS on CNB

Histologic features

- Stromal cellularity
- Stromal cell pleomorphism
- Stromal mitoses
- Relative stroma % vs. epithelium
- Stromal enhancement at epith
- Infiltrative edge
- Heterologous stromal elements
- Stromal overgrowth
- Leaf-like growth
- Epith Hyperplasia
- Necrosis
- Multinucleated giant cells

FELCS on CNB

- Immunohistochemistry
  - Mib1
  - Topoisomerase 2α
  - p53
- Radiology-pathology correlation

Stromal Cellularity

Mild  Moderate  Marked
Stromal Cell Pleomorphism

Mild  Moderate  Marked

FELCS on CNB

Predictors of Phyllodes Tumor
Univariate Statistics

- Stromal Cellularity
- Stromal cell pleomorphism
- Stromal mitoses
- Relative stroma % vs epithelium
- Immunohistochemistry
  - Prolif: Ki67, Topo 2α
  - p53

FELCS on CNB
FELCS on CNB
Predictors of Phyllodes Tumor
Multivariate Statistics

• Stromal Cellularity
  ➢ Marked (all PT), mild (all FA)
• Stromal mitoses
  ➢ 75% PT cases vs. 17% FA cases
• Immunohistochemistry
  – Prolif: Ki67, Topo 2α

Jara-Lazaro et al.
CNB Features Correlating with Phyllodes at Excision

• Stromal cellularity
• Nuclear atypia
• Stromal overgrowth
• Mitoses ≥2/10hpf
• Ill-defined border
• PASH
• Ki67 ≥5%
• Topo 2α ≥5%
• CD34 decreased

All by univariate statistics

Predictors of phyllodes tumours on core biopsy specimens of fibroepithelial neoplasms
Anna Belieza Jara-Lazaro, Monirulho Akhter, Aye Aye Thike, Philip Chi Wai Lee
Division of Pathology, Singapore General Hospital, Singapore, and Department of Anatomical and Cellular Pathology,
China University of Hong Kong, Prince of Wales Hospital, Hong Kong, China

• 98 CNB cellular fibroepithelial lesion
• 57 excised (58%)
• Multiple histologic features
• IHC (Ki67, Topo 2α, CD34, CD117, bcl-2)
• CNB-Excision correlated
• Chi square univariate statistics
Stromal Cellularity on CNB

Jacobs 2005

Jara-Lazaro 2010

Cellular Fibroepithelial Lesions on CNB with Excision Outcome

Different Approaches

CNB Cellular FEL → Excision outcome
- Jacobs 2005
- Jara-Lazaro 2010

Excision PT or FA → Prior CNB features
- Lee 2007
- Tsang 2011

Histological features useful in the distinction of phyllodes tumour and fibroadenoma on needle core biopsy of the breast

A H S Lee, Z Jedli, I O Ellis & C W Elston
Hematopathology Department, Nottingham University Hospitals, Nottingham, UK

- 36 phyllodes at excision ← 44 prior CNBs
- 38 fibroadenoma at excision ← 37 prior CNBs
- CNB histologic features
Fibroepithelial on CNB
Lee, et al.

Histologic features
• Stromal cellularity
• Stromal cell pleomorphism
• Stromal mitoses
• Relative stroma % vs. epithelium
• Stromal enhancement at epith
• Infiltrative edge
• Heterologous stromal elements
• Stromal overgrowth
• Leaf-like growth
• Fat in stroma
• Fragmentation of cores
• Clefting

Figure 2. Fibroepithelial lesions showing the incidence reaction pleomorphisms of the stroma, the fragmentation, the clefting and fat adipose tissue within the stroma.

Lee et al.
Features on CNB most likely to precede phyllodes on excision
• Increased stromal cellularity
  (? higher threshold, 72% were PT)
• Fragmentation of cores
  (? Due to “leaf-like pattern”)
• Adipose tissue in stroma
  (okay in otherwise classic fibroadenoma)
• Stromal overgrowth
  (used 100x or 200x vs. 40x std)
Phyllodes tumours of the breast – differentiating features in core needle biopsy

Alex K H Young, Sin Ki Chan, Christopher C F Lam, Philip C W Lau, Helen H L Chan, Eddy Hon Tim & I Guy M Tel

Department of Pathology, Tsui Chi Hospital, 1Department of Pathology, Kwong Wah Hospital, 2Department of Anatomical and Cellular Pathology, Prince of Wales Hospital, The Chinese University of Hong Kong, 3Department of Pathology, A T Still Hospital, 4Department of Diagnostic Radiology and Ogan Imaging, Prince of Wales Hospital, 5The Chinese University of Hong Kong, 6Hong Kong, China, and 7Department of Pathology, Singapore General Hospital, Singapore city, Singapore

Excision:
- 49 phyllodes
- 69 fibroadenoma

Correlated with Phyllodes

Prior CNB:
- Stromal cellularity
- Mitoses
- Pleomorphism
- Stromal overgrowth
- Fragmentation
- Fat in stroma

Predicting PT based on CNB (Tsang 2011)

<table>
<thead>
<tr>
<th>CNB FELCS (FEL, PT)</th>
<th>Excision PT (n=49)</th>
<th>Excision FA (n=69)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNB FA</td>
<td>44 (28,16) “True Pos”</td>
<td>“False Pos”</td>
</tr>
<tr>
<td>CNB FA</td>
<td>3 “False Neg”</td>
<td>“True Neg”</td>
</tr>
</tbody>
</table>

Sensitivity = 44/49 = 90%
Specificity = “True Neg”/Exc FA = ?

FELCS on CNB – What to do?

- Variability in CNB sampling
- Degree of stromal cellularity, other path features subjective
- Low predictive power of radiology
- Excision of all FELCS on CNB remains prudent
- Path features may be of assistance in guiding surgery
Fibroadenoma on CNB, Phyllodes on Excision?

- Tsang: 3 (2.5%) of 118 total (biases?)
- Lee: <1% of 1757 CNB with FA
- Rare, but CNB with “fibroadenoma” does not entirely preclude phyllodes
- Balance sensitivity vs. specificity
- Red flags: larger, growing or subsequent growth, prior phyllodes

Fibroepithelial Lesions
Take Home Message

- Fibroadenomas are common, phyllodes tumors are uncommon
- Most phyllodes behave benignly
- Phyllodes are at risk of recurrence if incompletely excised, irrespective of category
- Cellular fibroepithelial lesions on CNB require surgical excision