Flat Epithelial Atypia (FEA)

Consensus finding

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Institute of Surgical Pathology

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Flat Epithelial Atypia (FEA)

**Definition**

Neoplastic alteration of the terminal ductulo-lobular units (TDLU) by one to some layers of cells with low-grade (monomorphic) atypia.
**Flat Epithelial Atypia (FEA)**

**Histopathology**

- Proliferation of round and uniform cells (low-grade atypia)
- Presence of inconspicuous nuclei

- Often presence of associated calcifications
- Lack of secondary architecture
  - (no roman bridges or cellular tufts)

- Characteristic immunophenotype:
  - ER strong positive
  - CK5/6 negative

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*WHO Classification of Tumors of the Breast (2012)*
*DABBS Breast Pathology (2012)*
Flat Epithelial Atypia (FEA)

Clinical presentation

Imaging: vast majority with microcalcification
irregular, branching calcifications
marked duct dilation

Incidence: 0-5% (0.16% Zurich data base)

Co-existing lesions
classical lobular neoplasia (LN)
other benign columnar cell lesions
ADH / DCIS
invasive tubular carcinoma

Common molecular pathway

WHO Classification of Tumors of the Breast (2012)
DABBS Breast Pathology (2012)
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**Differential diagnosis**
- Columnar cell change
- Flat atypia (low grade)
- Flat type 'clinging' DCIS (high grade)

**Spectrum of columnar cell lesions**
- Helpful: HE morphology
- Not helpful: Immunohistochemistry

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WHO Classification of Tumors of the Breast (2012)
DABBS Breast Pathology (2012)
1979
First described by J. Azzopardi

Two types of flat DCIS (1979)
1) High nuclear grade
2) Monomorphic low nuclear grade

1989
First follow-up study by V. Eusebi et al (Sem. Dig. Pathol 1994)

2003
Change in nomenclature (WHO 2003, 2012)
- High nuclear grade - flat or clinging DCIS – B5a
- Low nuclear grade - flat epithelial atypia (FEA) – B3
- No atypia – columnar cell lesions – B2
## Flat Epithelial Atypia (FEA)

### Prognosis – is FEA an obligat precursor?

FEA may be associated with a very light increased risk (1-2 times) of BC

<table>
<thead>
<tr>
<th>Study</th>
<th>BIRADS</th>
<th>n</th>
<th>Open excision</th>
<th>ADH</th>
<th>DCIS</th>
<th>Invasive Ca.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senetta Mod Pathol 2009</td>
<td>3 (40%) 4 (60%)</td>
<td>41</td>
<td>36 (87%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Piubello Am J Surg Path 2009</td>
<td>3 (93%) 4 (7%)</td>
<td>33</td>
<td>20 (60%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chivukula Am J Clin Path 2009</td>
<td>Mostly 4</td>
<td>35</td>
<td>35 (100%)</td>
<td>10</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Ingegnoli Breast J 2010</td>
<td>3 or 4</td>
<td>18</td>
<td>15 (83%)</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Darvishian Ann Clin Lab 2009</td>
<td>NA</td>
<td>12</td>
<td>12 (100%)</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Kunju Hum Pathol 2007</td>
<td>NA</td>
<td>14</td>
<td>14 (100%)</td>
<td>0</td>
<td>3</td>
<td>0</td>
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</tbody>
</table>
## Underestimation pure FEA (Literature)

### Core biopsy

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Count</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>17%</td>
<td>(10/60)</td>
<td>Lavoné-V (BREA 2011)</td>
</tr>
<tr>
<td>41%</td>
<td>(39/95)</td>
<td>Uzoaru-I (Virchrows Archiv 2012)</td>
</tr>
<tr>
<td>0%</td>
<td>(0/20)</td>
<td>Piubello (Am J Surg Pathol 2009)</td>
</tr>
<tr>
<td>20%</td>
<td>(4/20)</td>
<td>Noél-JC (Surg Oncol 2010)</td>
</tr>
</tbody>
</table>

### Vacuum biopsy

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Count</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>(0/29)</td>
<td>Dialani-V (Breast J 2014)</td>
</tr>
<tr>
<td>21%</td>
<td>(3/14)</td>
<td>Kunju-LP (Hum Pathol 2007)</td>
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</tbody>
</table>
## Flat Epithelial Atypia (FEA)

### Recommendation management AGO (2015)

<table>
<thead>
<tr>
<th>Description</th>
<th>Treatment</th>
<th>Oxford LoE/GR</th>
<th>AGO 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FEA in core/vacuum biopsy</strong></td>
<td>Open excision</td>
<td>3b /C</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>No excision necessary</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IF</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>lesion is small (&lt;2 TDLU)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Imaging finding completely removed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FEA on Resection margin</strong></td>
<td>No re-excision,</td>
<td>3b / C</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td>ONLY AT residual mammographic finding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Flat Epithelial Atypia (FEA)

**conclusions**

**FEA on core biopsy – excision or vacuum biopsy recommended**

- pure FEA on core
- visible lesion on imaging
- FEA and BIRADS 4
- discrepancy between histology and imaging

**FEA on core or vacuum biopsy – excision not necessary**

- BIRADS 3
- whole calcification removed by vacuum biopsy