3 Building Blocks of Cytodiagnosis: The “Gut Course” in FNA Biopsy

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AMERICAN SOCIETY FOR CLINICAL PATHOLOGY
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3 Building Blocks of Cytodiagnosis: The “Gut Course” in FNA Biopsy

Common things occur commonly. So, knowing what the common things are and what they look like, will allow you to diagnose most of the cases that come sliding across your microscope stage. This course will present 10 basic types of cells, the building blocks of cytodiagnosis. It is intended as a whirlwind tour of FNA biopsy cytodiagnosis. Among the common problems to be discussed is determining "Where's the Primary?" from a metastasis. Although some useful ancillary testing will be mentioned, the course will primarily review basic "bread and butter" cytomorphology.

FACULTY:

Richard Demay MD
Pathology Residents
Cytopathology
Cytopathology (Gynecologic)
2.0 CME/CMLE Credits

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Nothing to disclose

Also known as:

The Gut Course
(as in an easy course in college)
“Common things occur commonly”
...so if you hear hoof beats, don’t go looking for zebras

- Know what they are
- And, what they look like

=> Diagnose most cases
Among common problems:
“Where’s the primary?”

Unclassified Tumors

- Unknown Primary Tumors
  Only part of problem
- Unseen Primary tumors
  Original material not available
- Undifferentiated Tumors
  General category not determined

Basic Tumor Classification

- Carcinoma
- Lymphoma
- Sarcoma
- Melanoma
# Building Blocks

Look at cells, note general features:
- Single? Groups (what kind)?
- Squamous or glandular?
- Peculiar (“spindle”) shapes?
- Cytoplasm granular or clear?

Look at background:
- Clean? Mucoid? Cystic? Necrotic?
- Inflammatory? Calcified? Etc, etc

# Building Blocks of Cytodiagnosis

Basic Cell Types:
- Squamous
- Spindle
- Glandular
- Clear
- Leukocytes
- Granular
- Giant
- Neuroendocrine
- Small
- Melanoma

Foundation is Histopathology
**Building Block Diagnosis**

One can be enough
eg, malignant gland cells → AdCA
Also, combine to build diagnosis
Eg, lung and pancreatic cancers →
glandular and squamous features
When present => lung or pancreas

---

**Histopathology**

Foundation of diagnosis
Eg, Granular Cells + Leukocytes
Thyroid → Hashimoto Thyroiditis
Parotid → Warthin Tumor
Observations same, diagnosis different

---

**Building Blocks**

Squamous Cells
Squamous Cells

Designed for protection
Characterized by:
- Dense cytoplasm
- Distinct cell boundaries
These are the hallmarks of squamous differentiation

Benign Squamous Cells

Epidermal inclusion cysts
Branchial cleft cysts
Subareolar abscess
Skin contaminants
DDx: VWD Squamous CA

Mesothelial Cells

Common sources of error!
Very Well Differentiated SCC

- Head & Neck
- Skin
- Bladder

Clues:
- Bizarre shapes
- (No inflam' n or radiation)
- Nonkeratinizing cmpt

Keratinizing SCC

2 Key Features
- Marked keratinization
  - Orangeophilia, Pearls
- Marked pleomorphism
  - Bizarre shaped cells

Nonkeratinizing SCC

- Relatively uniform cells
- Less keratinization:
  - Note dense cytoplasm,
    distinct cell boundaries

Foreign body reaction:
- Clue to squamous differentiation
Building Blocks

Glandular Cells

Glandular Cells

- Columnar shape (N-C polarity)
- Sheets (honeycomb)
- Acinar structures (rosette-like)
- 3D groups (cell balls, papillae)

Glandular vs Squamous Cells

Glandular

- Nucleo-cytoplasmic polarity

Squamous

- Central nucleus
- Cytoplasm around

N-C polarity sensitive, not specific for glandular differentiation
### Columnar Cells

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Clue</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdCA</td>
<td>Mucin?</td>
</tr>
<tr>
<td>Carcinoids</td>
<td>NSG?</td>
</tr>
<tr>
<td>Plasmacytic</td>
<td>Ig?</td>
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</table>

### WD Adenocarcinoma

1st clue: Too many (glandular) cells!
- Abnormal architecture
- Too loose, too crowded
- Increased mitoses
- Rare doubt about cell
- Abnormal nuclei: Big and irregular

<table>
<thead>
<tr>
<th>Benign</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>some single cells</td>
</tr>
</tbody>
</table>
VWD Adenocarcinoma

Too many (glandular) cells
Abnormal architecture
  Too loose (drunken honeycombs)
  Too crowded
Abnormal nuclei
  Enlarged (± subtle)
  Irregular membranes
  Increased mitoses
Martian Popping Things*
  Single atypical cells
*Rare “no doubt about” cancer cells

Adenocarcinoma

Acinar structures
Mucus production

Microacinar Complexes

Prostate
Clue: Lipid

Thyroid
Clue: Colloid or flame cells
**Papillae**

Sometimes diagnostic:
- Breast Papilloma/CA
- Papillary Thyroid CA

Common in metastases
- Ovary, Thyroid, etc

*Consider renal origin!*

---

**Single File Cell Chains**

<table>
<thead>
<tr>
<th>AdenoCA</th>
<th>Other Tumors</th>
</tr>
</thead>
<tbody>
<tr>
<td>BREAST</td>
<td>Small Cell CA</td>
</tr>
<tr>
<td>GI Tract</td>
<td>Mesothelioma</td>
</tr>
<tr>
<td>Uterus</td>
<td>Carcinoids</td>
</tr>
<tr>
<td>Other</td>
<td><em>Melanoma</em></td>
</tr>
</tbody>
</table>

---

**Signet Ring Cells**

<table>
<thead>
<tr>
<th>AdenoCA</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>Lymphoma</td>
</tr>
<tr>
<td>Breast</td>
<td>Liposarcoma</td>
</tr>
<tr>
<td>Other sites</td>
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</tbody>
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### Signet Ring Cells

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<td>Liposarcoma</td>
</tr>
<tr>
<td>Other sites</td>
<td>Melanoma</td>
</tr>
</tbody>
</table>

### Intracytoplasmic Lumens (ICLs)

- In breast: CA 'till proven otherwise
- In met: Breast 'till proven otherwise

- Targetoid structures
  1. Sharp outline
  2. Clear space
  3. Mucin dot (bull's eye)

Strongly associated with breast CA

### Intranuclear Cytoplasmic Invaginations (INCl)

- INCl
**INCIs:**
- Liver
  - Favors Hepatocellular CA over Adenocarcinoma
- Melanoma
  - Usually present
- Lung
  - Bronchioloalveolar carcinoma
- Thyroid
  - Papillary carcinoma, others
  - Malignant til proven otherwise
- Many others, nonspecific

**“Terminal Bars” (Striated border)**
- Colorectal CA
  - Terminal bars
  - Columnar cells
  - Dirty necrosis
  - CK 20 positive

**“Terminal Bars” (Striated Border)**
- Colorectal carcinoma
- Other GI tract tumors
- Other tumors with enteric differentiation
- Lung, bronchioloalveolar carcinoma
- Ovary, mucinous tumors
- Cervix, endocervical adenocarcinoma
Mucin-Producing Tumors

Helps identify adenocarcinomas
- Mucin (+) favors:
  - Infra-diaphragmatic primary
- Mucin (−) non-squamous favors:
  - Supra-diaphragmatic primary

Mucin positivity excludes:

- LYMPHOMA
- SARCOMA
- MELANOMA
  Carcinomas: Renal, Adrenal, Acinic
  Germ cell tumors (except yolk sac)
  Small cell tumors of childhood
  Neuroendocrine neoplasms

Lipid

AdCA: Kidney, Prostate, Lung, Breast
Sarcoma, HCC, Adrenal, Melanoma
Hyaline Globules

- Carcinoma
- Sarcomas
- Lymphoma
- Germ cell
- Melanoma

Liver:
Favors HCC
Over Met CA

Pancreas:
Solid pseudo-papillary neoplasm

Combined Differentiation

<table>
<thead>
<tr>
<th>Glandular Features</th>
<th>Squamous Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>~ Secretion</td>
<td>~ Keratin</td>
</tr>
<tr>
<td>Cytoplasmic</td>
<td>Cytoplasmic</td>
</tr>
<tr>
<td>Basophilia*</td>
<td>Eosin*/Orange**ophilia</td>
</tr>
<tr>
<td>Foaminess*</td>
<td>Density**</td>
</tr>
<tr>
<td>Mucin vacuoles***</td>
<td>Keratin rings***</td>
</tr>
<tr>
<td>Nucleocytoplasmic polarity**</td>
<td>Central nuclei*</td>
</tr>
<tr>
<td>Well formed glands, secretion***</td>
<td>Pearls***</td>
</tr>
<tr>
<td>3D groups*</td>
<td>Flat sheets*</td>
</tr>
<tr>
<td>Microacini**</td>
<td>Intercellular bridges**</td>
</tr>
</tbody>
</table>

* → *** :: weak → strong evidence
Combined Tumors

- Lung  Non-Small Cell CA
- Pancreas  Ductal CA
- Uterus  EC & EM CA
- Breast  Metaplastic CA
- Thyroid  Papillary CA

Any Mucoepidermoid
or Adenosquamous CA

Building Blocks

Leukocytes
Abscess

Forms mass, mimics neoplasm
Creamy yellow fluid: abscess vs SCC
WARD cells vs tumor cells

“Chronic Lymphadenitis”

- Range of maturation
  Mostly small, “mature” lymphs
  Plasma cells frequently present
- Tingible body macrophages
- No malignant cells

Malignant Lymphoma

*Can be easy to diagnose!*
- Single cell pattern
- Characteristic morphology
- Lymphoglandular bodies

*But difficult to classify* (TGFI)
Single Cell Pattern

- Lymphoma
- Sarcoma
- Melanoma

Others, e.g., Carcinoids

Lymphomas Simplified!
4 Cells of Non-Hodgkin Lymphoma

1. Small lymphocytes
   (well differentiated, “mature”)

2. Cleaved cells
   (small and large centrocytes)

3. Large noncleaved cells
   (centroblasts and immunoblasts)

4. Small noncleaved cells (blasts)
   (lymphoblasts, Burkitt cells)

Non-Hodgkin Lymphomas

Small lymphocytic: “pure small lymphs
± a few proliferation center cells
Follicular: centrocytes + centroblasts ± small lymphs
Mantle cell: centrocyte-like cells; no centroblasts
Large cell: large lymphoid cells
Burkitt: lymphoblasts, dark blue cytoplasm, lipid vacuoles
Lymphoblastic: lymphoblasts (smooth or convoluted)

Small Lymphocytic Lymphoma

“Pure population small lymphs
± Proliferation center cells
Small cells, smooth nuclei, coarse chromatin
CD5+, CD23+, CD19+, CD20+, CD10-
**Follicular Lymphoma**

Variable proportions of centrocytes and centroblasts
CD19+, CD20+, CD5-, CD23-, CD10 often (+)

**Mantle Cell Lymphoma**

Centrocyte-like cells; no centroblasts
Patterns of CD23 and cyclin D1 expression distinguish SLL (+/–) from mantle cell (–/+)

**Large Cell Lymphoma**

Non-cleaved
Immunoblastic
“Blastic Lymphomas”

- Lymphoblastic
- Burkitt

Anaplastic Large Cell Lymphoma

ALK (+); CD30 (Ki-1)
Hallmark cells

1 Cell of Hodgkin Lymphoma

1. Reed Sternberg cell in proper milieu

Melanoma
Hodgkin Lymphoma

Review

- Benign Reactive Hyperplasia
  Range of maturation
  Small, mature lymphs predominate

- Non-Hodgkin Lymphoma
  Excess or replacement of heterogeneous cells with 1 (or 2) of 4 cells
  Most lymphomas = centrocytes + centroblasts in variable proportions
  More centroblasts => worse prognosis

Review

TBMs do not exclude lymphoma!
~ High mitotic rate or necrosis
If TBMs rare, large cells numerous
  Suspect lymphoma
Mitotic figures:
  Plentiful in reactive nodes
  High grade lymphomas
  Rate ~ prognosis
Warning Signs for Lymphoma

- Small “mature” lymphs not predominant cell type
- “Immature” lymphs prominent; No Tingible Body Macrophages (TBMs common in high grade NHL, HD)
- Sparse aspirate from large node or in generalized lymphadenopathy

Plasma Cells

<table>
<thead>
<tr>
<th>Reactive</th>
<th>Neoplastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed inflammatory infiltrate</td>
<td>Pure plasma cells</td>
</tr>
<tr>
<td>Mature plasma cells</td>
<td>Immature plasma cells</td>
</tr>
<tr>
<td>Surround vessels</td>
<td>Form sheets</td>
</tr>
<tr>
<td>Russell bodies -Cytoplasmic</td>
<td>Dutcher bodies -Nuclear</td>
</tr>
</tbody>
</table>

Plasmacytoma
Plasmacytoid Cells

Lymphocytes + Glandular Cells

Metastatic Malignancy

Premier use of FNA biopsy
SAFE: Simple, Accurate, Fast, Economic
Dx: Foreign cells (“Aliens”) 
DDx: Benign inclusions (rare); Lymphoma
Building Blocks

Giant Cells

Size is relative in cytology...

You need a microscope...
...to see a giant cell!

Giant Cells

- Benign
  Osteoclasts; Megakaryocytes
  Giant Cell Histiocytes, etc
- Malignant
  Pleomorphic Sarcomas
  Pleomorphic Carcinomas, etc
Benign Giant Cells

Benign

Megakaryocytes

Benign Giant Cells

Normal in bone marrow
Inadvertent sampling → FP
Osseous and nonosseous lesions, eg, myelolipomas
Circulating in blood

Normal in bone
Various tumors
Also, stroma malignant tumors

Giant Cells: Granuloma

- Squamous differentiation in poorly differentiated ca
- Papillary carcinoma in thyroid FNA biopsy
- Hodgkin lymphoma in lymphoid tissue

DDx: Spindle cell neoplasm
Granulomas
Infections:
  TB, mycosis, etc
Sarcoidosis
Rad’n, chemoRx, surgery
Silicone, Heavy metals
Necrobiosis, eg, rheumatoid
Granulomatous:
  thyroiditis, sialadentis, etc
Can mimic neoplasm

Tumors with Granulomas
Carcinomas
  with squamous diff’n
  incl papillary thyroid CA
Germinoma/seminoma
Certain lymphomas
Hodgkin lymphoma
T-cell lymphomas
Epithelioid sarcoma
Mesothelioma

Malignant Giant Cells
- Carcinomas
  Lung, Pancreas, others
- Sarcomas
  Pleomorphic, eg, “MFH”
- Germ cell tumors
  Choriocarcinoma
- Neuroendocrine
  Pheochromocytoma
- Lymphoreticular
  Anaplastic, Hodgkin
- Melanoma

DDx:
Building Blocks

Small Cells

<table>
<thead>
<tr>
<th>L</th>
<th>E</th>
<th>M</th>
<th>O</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image0.jpg" alt="Lymphoma" /></td>
<td><img src="image1.jpg" alt="E wing/PNET" /></td>
<td><img src="image2.jpg" alt="M yosarcoma (rhabdo-)" /></td>
<td><img src="image3.jpg" alt="O at (small) cell CA" /></td>
<td><img src="image4.jpg" alt="N euroblastoma" /></td>
</tr>
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- Lymphoma
- E wing/PNET
- M yosarcoma (rhabdo-)
- O at (small) cell CA
- N euroblastoma

Small Cells

Male: 65
### Small Clues

<table>
<thead>
<tr>
<th>Category</th>
<th>Tumor Type</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>Lymphoma</td>
<td>Single cells, LGBs</td>
</tr>
<tr>
<td>II</td>
<td>Breast (AdCA)</td>
<td>Adult women</td>
</tr>
<tr>
<td></td>
<td>Lung (Small Cell CA)</td>
<td>Older smokers</td>
</tr>
<tr>
<td>III</td>
<td>Ewing/PNET</td>
<td>K</td>
</tr>
<tr>
<td></td>
<td>Neuroblastoma</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>Rhabdomyosarcoma</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Wilms tumor</td>
<td>S</td>
</tr>
</tbody>
</table>

---

![Neuroblastoma](image1.png)

Neuroblastoma: Monomorphic, Rosettes
 Neural and clinical markers

![Ewing/PNET](image2.png)

Ewing/PNET: Dimorphic
 Neural markers; t(11;22)

![Rhabdomyosarcoma](image3.png)

Rhabdomyosarcoma: Polymorphic, Myxoid
 Desmin, etc

Look for anaplasia

---

### Small Clues

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![Melanoma](image4.png)

Melanoma: Small cell

---

Page 28
**Rosettes**

- Neuroendocrine neoplasms
  - Neuroblastoma
  - Ewing/PNET (rare)
  - Carcinoid tumors
  - Small cell carcinoma

- Other neoplasms
  - Wilms tumor
  - Rhabdomyosarcoma
  - Lymphoma, myeloma (rare)
  - Melanoma (rare)

**DDx:** Glandular acini; Call-Exner bodies

---

**DDx Blastomas**

<table>
<thead>
<tr>
<th>If it’s in:</th>
<th>It’s probably:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>Hepatoblastoma</td>
</tr>
<tr>
<td>Pancreas</td>
<td>Pancreatoblastoma</td>
</tr>
<tr>
<td>Lung</td>
<td>Pulmonary blastoma</td>
</tr>
<tr>
<td>Kidney</td>
<td>Nephroblastoma</td>
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<tr>
<td>Adrenal</td>
<td>Neuroblastoma</td>
</tr>
<tr>
<td>Eye</td>
<td>Retinoblastoma</td>
</tr>
<tr>
<td>Brain</td>
<td>Medulloblastoma</td>
</tr>
</tbody>
</table>

---

**Building Blocks**

**Spindle Cells**
Spindle Cell Lesions
- Neoplastic
- Pseudosarcoma
- Sarcomas
- Neuroendocrine
- Carcinoma
- Nonneoplastic
- Spindle Cell Lesions
- Pseudosarcoma
- Carcinoma
- Nonneoplastic
- Spindle Cell Lesions
- Neoplastic
- Pseudosarcoma
- Sarcomas
- Neuroendocrine
- Carcinoma
- Nonneoplastic
- Cercariform Cells
- Urothelial Carcinoma
- Schistosoma
- Cercaria
- p63
Biphasic: Spindle & Epithelioid Cells

- Carcinosarcomas
  - Lung, breast, uterus, etc
- Sarcomas
  - Synovial sarcoma
  - Epithelioid leiomyosarcoma
  - Malignant schwannoma
- Neuroendocrine tumors
- Mesothelioma
- Melanoma
- Endometriosis

Building Blocks

Clear Cells

Then, many other tumors...
Clear Cell Tumors

Kidney, kidney, kidney
Various other carcinomas
Germ cell tumors
Neuroendocrine tumors
Sarcomas
Melanoma

Melanoma

Building Blocks

Granular Cells
Granular Cells

Granular cell tumors
Hepatocytes
Acinar/acinic carcinomas

Granular Cells

Oncocytic neoplasms
Granular cell tumors
Melanoma
Acinar/acinic carcinomas

Clear + Granular

Renal Cell Carcinoma
CK +VIM; CDS10
Hepatocellular CA, Melanoma
# Building Blocks

## Neuroendocrine Cells

<table>
<thead>
<tr>
<th>Neuroendocrine Tumors</th>
<th>Neuroneplastic Tumors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinoid Type</td>
<td>Small Cell Type</td>
</tr>
<tr>
<td>Carcinoids (typical, atypical)</td>
<td>Small Cell CA</td>
</tr>
<tr>
<td>Islet Cell Tumors</td>
<td>Neuroblastoma</td>
</tr>
<tr>
<td>Medullary Thyroid CA</td>
<td>Neuroepithelioma</td>
</tr>
<tr>
<td>Paraganglioma/Pheochromocytoma</td>
<td>Ewing/PNET</td>
</tr>
</tbody>
</table>

Note: The table is not fully visible due to cropping.
### Clinical Syndromes

<table>
<thead>
<tr>
<th>Tumor</th>
<th>Hormone</th>
<th>Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classic carcinoid</td>
<td>Serotonin</td>
<td>Carcinoid</td>
</tr>
<tr>
<td>Medullary thyroid CA</td>
<td>Calcitonin</td>
<td>Hypocalcemia</td>
</tr>
<tr>
<td>Pancreatic endocrine neoplasms</td>
<td>Gastrin</td>
<td>Zollinger-Ellison</td>
</tr>
<tr>
<td></td>
<td>Insulin</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>Pheochromocytoma</td>
<td>Epinephrine/Norepinephrine</td>
<td>HTN, sweating, palpitations</td>
</tr>
<tr>
<td>Small Cell CA</td>
<td>ACTH</td>
<td>Cushing</td>
</tr>
</tbody>
</table>

Note: Neoplasms often produce >1 hormone

---

### Carcinoid Tumors

**Clinical syndromes**

- "Salt & Pepper" Chromatin
- Lympho/plasmacytoid cells
- Spindle cells
- "Endocrine Atypia"

**Combo suggests** diagnosis

---

### Carcinoids

- Monotonous cells
- Lympho/plasmacytoid
- Small spindle cells
- ± "Endocrine atypia"
- Salt-&-pepper chromatin
- Neurosecretory granules
- Occasional rosettes
- Immunochemistry
Neuroendocrine Carcinomas

Grades I, II, III

- Mitosis
- Necrosis

Gr I
Carcinoid

Gr II
Large Cell

Gr III
Atypical Carcinoid*

Small Cell CA

*The more it looks like small cell ca, the worse the pt’s prognosis

Building Blocks

Melanoma

Many Faces of Melanoma

- Pearls
- Columnar
- Rosettes
- R.S like cells, small cells
- Clear cells
- Granular
- Myoid stroma
Melanoma

- Clinical history!
- Poor cohesion
- Scattered giant cells
- Bug-eyed D-MINs (demons)
- Intranuclear cytoplasmic invaginations
- Melanin (you should be so lucky!)
  - Also: spindle, columnar, small, clear cells, etc

Immuno: S100, HMB-45, Melan A (+); CK (-)

Melanoma

- Typical pattern:
  - Cellular, dispersed, scattered giant cells
  - D-MIN (demon)

Pigment

- You should be so lucky!

Cysts: Breast, Thyroid, Salivary, etc

- The Rule for Cysts
  - Drain as completely as possible
  - Reaspirate any residual mass
  - Excise if recurs more than once

- "Nondiagnostic: cyst content"
**Thyroid Colloid**

- Fundamental role in evaluation of follicular lesions:
  - More colloid: more likely benign, nonneoplastic
  - (exclude papillary thyroid carcinoma)

**Mucins: Metachromatic**

- Ciliated mucin
- Metachromatic mucin
- Sulfated acid mucin
- Basement membrane

**Colloid Tumors**

- Colloid carcinomas
  - GI tract
  - Breast*
  - Ovary
  - Pancreas
  - Pseudomyxoma peritonei
  - Myxoid sarcomas
  - Melanoma
  - (*DDx: myxoid fibroadenoma, R/O Carney complex!)
**Amyloid**

Various diseases:
- Sporadic
- Familial/inherited
- Degenerative
- Infections
- Neoplasms
- Abnormal protein folding, deposition

**Psammoma bodies**

Associated with papillary neoplasms, thyroid, ovary, lung, kidney, breast

Occur many benign & malignant conditions

=> not specific, even for malignancy

In specific sites, eg, thyroid, highly suggestive PTC

**5 Vascular Patterns**

Perithelial: Ewing/PNET, solitary fibrous tumor
Sinusoidal: eg, hepatocellular CA
Arborizing: Granulation tissue, colloid CA, SPEN, liposarcoma
Papillary: papillary neoplasms
Naked vessels: eg, Hepatocellular CA

Arborizing: Fine branching capillaries dissection through tumor or inflammation
Papillary: cores, vessels invested with cells
Perihelial: Cells apposed to vessels, invested with endothelium
Naked vessels: Bridging cell groups
WARD Cells

Worrisome Atypia in Reactive/Degenerative Cells

"It happens" Forrest Gump

The way you get in trouble in FNA biopsy is overreading a few atypical cells!

Benign

Malignant

Thank you