Neoplasia I: Tumor Nomenclature

Kristine Krafts, M.D.
Why do we need a lecture about neoplasia?

- To understand patients better
- To understand oral neoplasms better
- To nail the neoplasia questions on boards
- This lecture covers:
  - the nature of benign and malignant neoplasms
  - how neoplasms start and grow
- Later lectures will cover:
  - the nature of specific neoplasms
  - how these neoplasms affect the patient
Neoplasia Outline

- Tumor nomenclature
- Tumor characteristics
- Epidemiology
- Cancer pathogenesis
Neoplasia Outline

- Tumor nomenclature
  - Definitions
  - Benign tumors
  - Malignant tumors
  - Mixed tumors
  - Confusing terms
Neoplasia Outline

- Tumor nomenclature
- Definitions
Definitions

• Neoplasm = mass of tissue that grows excessively, and keeps growing even if you remove the stimulus that started it off!

• Tumor = neoplasm

• Benign tumor = innocent-acting tumor

• Malignant tumor = evil-acting tumor
Cancer = Latin for “crab”
## Definitions

<table>
<thead>
<tr>
<th>Benign Tumors</th>
<th>Malignant Tumors</th>
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<tr>
<td>• Small</td>
<td>• Large</td>
</tr>
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</tr>
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Benign Tumors: Small, Slow-growing, Non-invasive, Well-differentiated, Stay localized.

Malignant Tumors: Large, Fast-growing, Invasive, Poorly-differentiated, Metastasize.
Definitions

The only indisputable quality of malignancy is **metastasis**!

Benign tumors CANNOT metastasize; malignant tumors CAN.

If it is metastatic, it MUST BE malignant.
Benign vs. Malignant

BENIGN (Leiomyoma)
- Small
- Well demarcated
- Noninvasive
- Nonmetastatic
- Slow growing
- Well differentiated

MALIGNANT (Leiomyosarcoma)
- Large
- Poorly demarcated
- Rapidly growing with hemorrhage and necrosis
- Locally invasive
- Metastatic
- Poorly differentiated

Diagram showing the differences in structure and growth patterns between benign and malignant conditions.
Neoplasia Outline

• Tumor nomenclature
  • Definitions
  • Benign tumors
Meet the only guy who changes his identity more often than his underwear.

Fletch. Until last week, he was just another mild-mannered reporter fighting for truth, justice and a window office. Now he's being threatened, shot at, accosted and arrested! And that's by the people he's trying to help. But there's still one thing even more dangerous than his work. His love life.

Chevy Chase

Fletch

MICHAEL RITCHIE

DOUGLAS GROSSMAN

JOE DON BAKER - DANN WHEELER - NICHOLSON - RICHARD LEERTON - KAREEM ABDUL JABBAR - TIMMIE HODSON - ANDREW VERGIANI - HAROLD PALERMO - BURT LEVEN - ALAN GROSZMAN - PETER DOUGLAS - MICHAEL RITCHIE

RISCO

Fletch
Dr. Rosenpenis
Dr. Rosenpenis

"carcinoma...some kind of noma."

Dr. Rosenpenis
Benign Tumors

Usually designated by adding “-oma” to cell type
- adenoma: benign tumor of glandular cells
- leiomyoma: benign tumor of smooth muscle cells
- chondroma: benign tumor of chondrocytes

Other benign tumor names
- papilloma: has finger-like projections
- polyp: projects upward, forming a lump
- cystadenoma: has hollow spaces (cysts) inside
Thyroid adenoma
Thyroid adenoma
Thyroid adenoma

Normal thyroid
Leiomyoma
Chondroma
Oral papilloma
Oral papilloma
Colon polyp
Colon polyp
Colon polyp
Ovarian cystadenoma
Ovarian cystadenoma
Ovarian cystadenoma
Neoplasia Outline

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Malignant Tumors

Carcinomas arise in epithelial tissue
  • adenocarcinoma: malignant tumor of glandular cells
  • squamous cell carcinoma: malignant tumor of squamous cells

Sarcomas arise in mesenchymal tissue
  • chondrosarcoma: malignant tumor of chondrocytes
  • angiosarcoma: malignant tumor of blood vessels
  • rhabdomyoscarcoma: malignant tumor of skeletal muscle cells
Squamous cell carcinoma
Chondrosarcoma
Angiosarcoma
Rhabdomyosarcoma
Neoplasia Outline

• Tumor nomenclature
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  • Mixed tumors
Mixed Tumors

• “Mixed” tumors show divergent differentiation

• Examples
  • pleomorphic adenoma – glands + fibromyxoid stroma
  • fibroadenoma – glands + fibrous tissue

• Not to be confused with teratomas
Pleomorphic adenoma
Neoplasia Outline

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  - Confusing terms
Confusing Terms

Malignant tumors that sound benign
• lymphoma
• mesothelioma
• melanoma
• seminoma

Non-tumors that sound like tumors
• hamartoma: mass of disorganized indigenous tissue
• angiosarcoma: heterotopic rest of cells

Names that seem to come out of nowhere
• nevus
• leukemia
• hydatidiform mole
Neoplasm

Benign

Carcinoma

Malignant

Sarcoma
Nomenclature

- Neoplasm
  - Benign
    - adenoma
    - angioma
    - rhabdomyoma
  - Malignant
    - Carcinoma
    - Sarcoma
Nomenclature

Neoplasm

Benign

Malignant

Carcinoma

Sarcoma

squamous cell carcinoma
adenocarcinoma
Nomenclature

- Neoplasm
  - Benign
  - Malignant
    - Carcinoma
    - Sarcoma
      - angiosarcoma
      - rhabdomyosarcoma
## Know these names!

<table>
<thead>
<tr>
<th>Tissue of origin</th>
<th>Benign</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibrous tissue</td>
<td>Fibroma</td>
<td>Fibrosarcoma</td>
</tr>
<tr>
<td>Fat</td>
<td>Lipoma</td>
<td>Liposarcoma</td>
</tr>
<tr>
<td>Cartilage</td>
<td>Chondroma</td>
<td>Chondrosarcoma</td>
</tr>
<tr>
<td>Bone</td>
<td>Osteoma</td>
<td>Osteogenic sarcoma</td>
</tr>
<tr>
<td>Blood vessels</td>
<td>Hemangioma</td>
<td>Angiosarcoma</td>
</tr>
<tr>
<td>Mesothelium</td>
<td></td>
<td>Mesothelioma</td>
</tr>
<tr>
<td>Hematopoietic cells</td>
<td></td>
<td>Leukemia</td>
</tr>
<tr>
<td>Lymphoid cells</td>
<td></td>
<td>Lymphoma</td>
</tr>
<tr>
<td>Squamous epithelium</td>
<td>Squamous cell papilloma</td>
<td>Squamous cell carcinoma</td>
</tr>
<tr>
<td>Glandular epithelium</td>
<td>Adenoma</td>
<td>Adenocarcinoma</td>
</tr>
<tr>
<td></td>
<td>Papilloma</td>
<td>Papillary adenocarcinoma</td>
</tr>
<tr>
<td></td>
<td>Cystadenoma</td>
<td>Cystadenocarcinoma</td>
</tr>
<tr>
<td>Smooth muscle</td>
<td>Leiomyoma</td>
<td>Leiomyosarcoma</td>
</tr>
<tr>
<td>Skeletal muscle</td>
<td>Rhabdomyoma</td>
<td>Rhabdomyosarcoma</td>
</tr>
<tr>
<td>Melanocytes</td>
<td>Nevus</td>
<td>Melanoma</td>
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Sample board question

Which of the following describes a benign tumor arising from skeletal muscle?

A. Leiomyoma
B. Papilloma
C. Rhabdomyoma
D. Leiomyosarcoma
E. Rhabdomyosarcoma