Neoplasia I: Tumor Nomenclature
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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>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>Large</td>
</tr>
<tr>
<td>Slow-growing</td>
<td>Fast-growing</td>
</tr>
<tr>
<td>Non-invasive</td>
<td>Invasive</td>
</tr>
<tr>
<td>Well-differentiated</td>
<td>Poorly-differentiated</td>
</tr>
<tr>
<td>Stay localized</td>
<td>Metastasize</td>
</tr>
</tbody>
</table>
**Definitions**

**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
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 mid-informed reporter fighting forthwith, justice and a window office. Now he’s being threatened, sueted at, accused and anointed. And quit 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 RITCHE  
DOUGLAS GROSSMAN  
Joe Don Baker, Dan Wheeler, Nicholson, Richard Leete, George, Mark, Chandra, Suchak, Sterner, Glucolog, Henry, Harrel
“He has melanoma... 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
Chondroma
Oral papilloma
Oral papilloma
Colon polyp

- Head
- Stalk
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
• rhabdomyosarcoma: malignant tumor of skeletal muscle cells
Adenocarcinoma
Squamous cell carcinoma
Chondrosarcoma
Angiosarcoma
Rhabdmyosarcoma
Neoplasia Outline

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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

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

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

Names that seem to come out of nowhere
- nevus
- leukemia
- hydatidiform mole
Nomenclature

Neoplasms can be classified into two categories: benign and malignant. Benign neoplasms include adenoma, angioma, and rhabdomyoma. Malignant neoplasms are further divided into carcinoma and sarcoma.
Neoplasm

Benign

Malignant

Carcinoma

Sarcoma

squamous cell carcinoma

adenocarcinoma
Nomenclature

Neoplasm

Benign

Malignant

Carcinoma

Sarcoma

angiosarcoma

rhabdomyosarcoma
<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>
</tr>
</tbody>
</table>
Which of the following describes a benign tumor arising from skeletal muscle?

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