CHARACTERISTICS OF BENIGN AND MALIGNANT TUMORS
Characteristics of benign and malignant tumors

- **Tumor**: is a pathologic disturbance of growth, characterized by excessive and unnecessary proliferation of cells.
- There are two types of tumors: **benign and malignant**.
- The differentiation of a benign from a malignant tumor is very important so there are criteria by which benign and malignant tumors can be differentiated, and they behave accordingly. These differences can be discussed under the following headings: (1) differentiation and anaplasia, (2) rate of growth, (3) local invasion, and (4) metastasis.
1. Differentiation

- Tumors are often “graded” as to how closely they resemble the normal parent tissue that they are derived from, tumors can be
- **Fully differentiated**: exactly similar to normal-a feature of benign tumor.
- “Well-differentiated” means the cells are very similar in appearance and architectural arrangement to normal tissue of that organ.
“Poorly-differentiated” refers to tumors that show only minimal resemblance to the normal parent tissue they are derived from.

“Anaplastic” means the tumor shows no obvious similarity to its parent tissue and almost always indicates malignancy.

Benign tumors are always fully differentiated.

Malignant tumors
  - well differentiated
  - moderately differentiated
  - poorly differentiated
  - undifferentiated (anaplastic)
Thyroid, adenoma
lipoma
Well diff. adeno-carcinoma stomach
Adenocarcinoma (microscopically)

Poorly differentiated

Moderately differentiated
Undifferentiated (anaplastic) Neoplasm
In general, the growth rate of tumors correlates with their level of differentiation, and thus most malignant tumors grow more rapidly than do benign lesions. There are, however, many exceptions to such an oversimplification. Some benign tumors have a higher growth rate than malignant tumors.
3. **Local invasion and encapsulation**

- The local invasion is the most reliable feature that distinguishes malignant from benign tumors.

- Benign tumors are often encapsulated, and grow by expansion and they “push” other tissues away – but they don’t truly invade. Malignant tumors generally are not encapsulated. As they grow, they tend to infiltrate, invade, and destroy surrounding tissue.
Malignant versus Benign Tumors

Benign (not cancer) tumor cells grow only locally and cannot spread by invasion or metastasis.

Malignant (cancer) cells invade neighboring tissues, enter blood vessels, and metastasize to different sites.
Gross (macroscopic) features of two breast neoplasms

**Benign** – circumscribed, often encapsulated, pushes normal tissue aside

**Malignant** – infiltrative growth, no capsule, destructive of normal tissues
4. Metastasis

- Metastasis means that there is a secondary implant of a tumor in a distant tissue.
- Metastasis marks a tumour as malignant because benign neoplasms do not metastasize. With few exceptions all cancers can metastasize. The major exception is basal cell carcinoma of the skin.
Variable-sized nodules of metastatic carcinoma of lung
## Differences between benign and malignant tumors

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benign</th>
<th>Malignant</th>
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</thead>
<tbody>
<tr>
<td><strong>Capsulation</strong></td>
<td>Usually present</td>
<td>Usually absent</td>
</tr>
<tr>
<td><strong>Mode of growth</strong></td>
<td>By expansion</td>
<td>By infiltration</td>
</tr>
<tr>
<td><strong>Differentiation</strong></td>
<td>Fully differentiated</td>
<td>variable</td>
</tr>
<tr>
<td><strong>Anaplasia</strong></td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td><strong>Rate of growth</strong></td>
<td>Slow</td>
<td>Rapid</td>
</tr>
<tr>
<td><strong>Metastasis</strong></td>
<td>Does not happen</td>
<td>May occur</td>
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<tr>
<td><strong>Recurrence</strong></td>
<td>Usually do not recur</td>
<td>Common</td>
</tr>
<tr>
<td><strong>Fate</strong></td>
<td>Cured by excision (if not in vital area)</td>
<td>Usually fatal</td>
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</table>
Comparison between a benign tumor of the myometrium (leiomyoma) and a malignant tumor of similar origin (leiomyosarcoma).
THANKS FOR LISTENING