

Oncology

Class-1

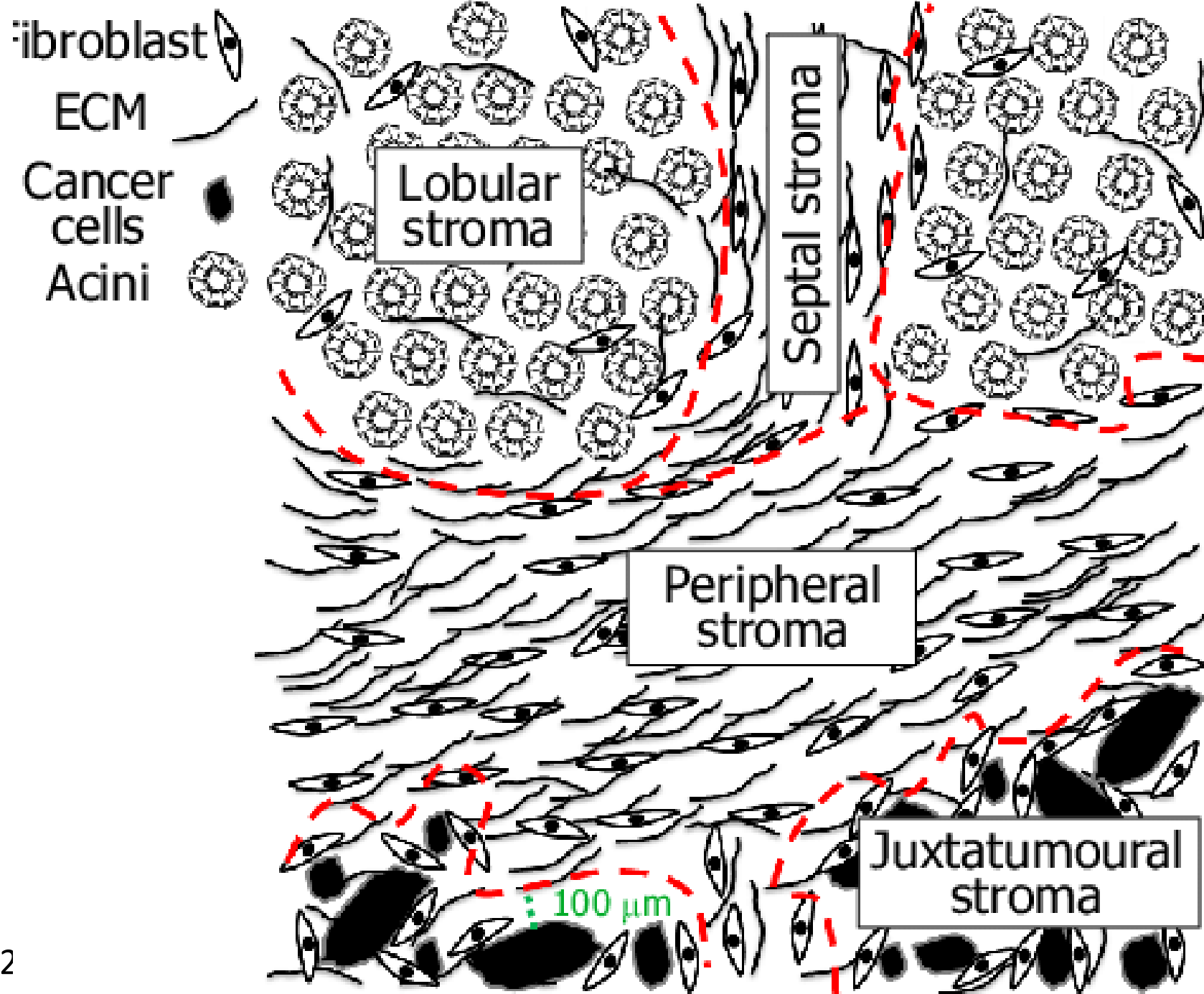
Tumor pathology

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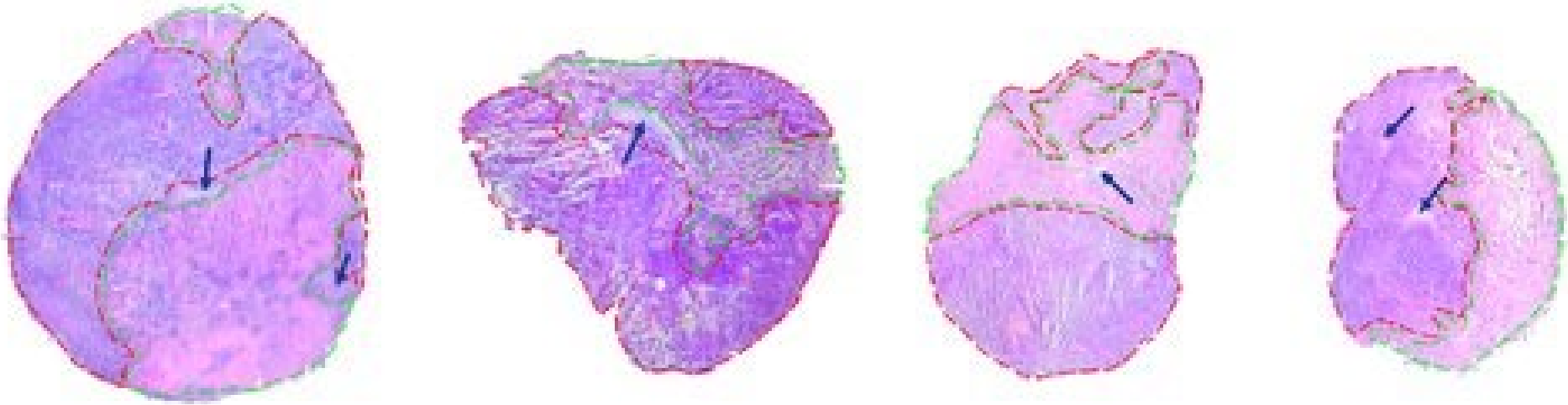
Nomenclature

- Neoplasia means “new growth,” and a new growth is called a neoplasm. Tumor originally applied to the swelling caused by inflammation, but the nonneoplastic usage of tumor has almost vanished; thus, the term is now equated with neoplasm.
- Oncology (Greek oncos = tumor) is the study of tumors or neoplasms.
- a neoplasm can be defined as a disorder of cell growth that is triggered by a series of acquired mutations affecting a single cell and its clonal progeny. As discussed later, the causative mutations give the neoplastic cells a survival and growth advantage, resulting in excessive proliferation that is independent of physiologic growth signals

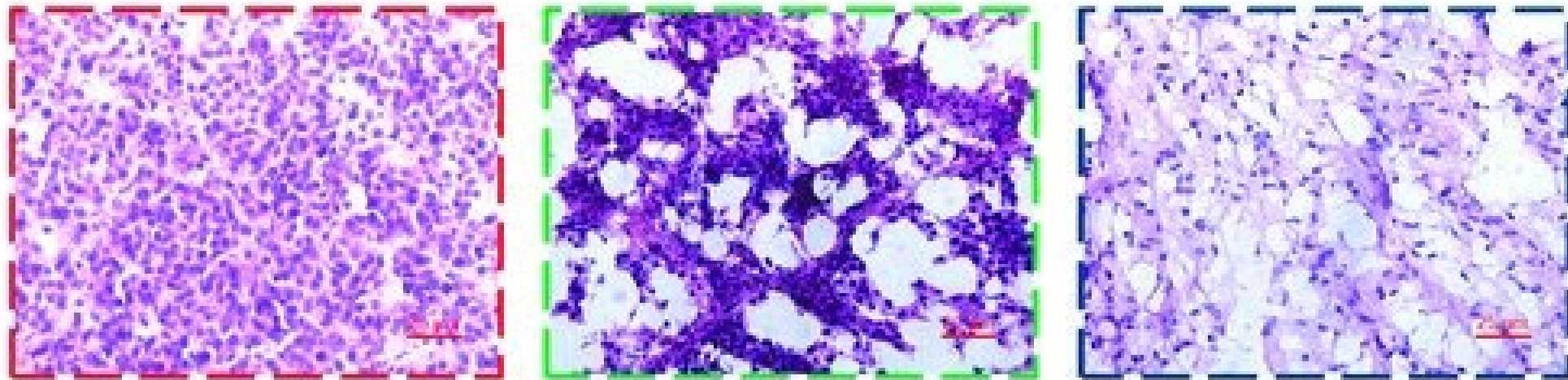
- All tumors have two basic components:
- (1) neoplastic cells that constitute the tumor parenchyma and
- (2) reactive stroma made up of connective tissue, blood vessels, and variable numbers of cells of the adaptive and innate immune system.
- The classification of tumors and their biologic behavior are based primarily on the parenchymal component, but their growth and spread are critically dependent on their stroma.
- In some tumors, connective tissue is scant and so the neoplasm is soft and fleshy.
- In other cases, the parenchymal cells stimulate the formation of an abundant collagenous stroma, referred to as desmoplasia. Some desmoplastic tumors—for example, some cancers of the female breast—are stony hard or scirrhous.



A



B



Tumor parenchyma area

Tumor necrosis area

Tumor stroma area

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Benign Tumors

- Benign Tumors. A tumor is said to be benign when its gross and microscopic appearances are considered relatively innocent (resemble the tissue of origin), implying that it will remain localized, will not spread to other sites, and is amenable to local surgical removal; understandably, the patient generally survives.
- However, “benign” tumors may cause significant disease and are sometimes even fatal.
- In general, benign tumors are designated by attaching the suffix -oma to the name of the cell type from which the tumor originates. Tumors of mesenchymal cells generally follow this rule. For example, a benign tumor arising in fibrous tissue is called a fibroma, whereas a benign cartilaginous tumor is a chondroma.

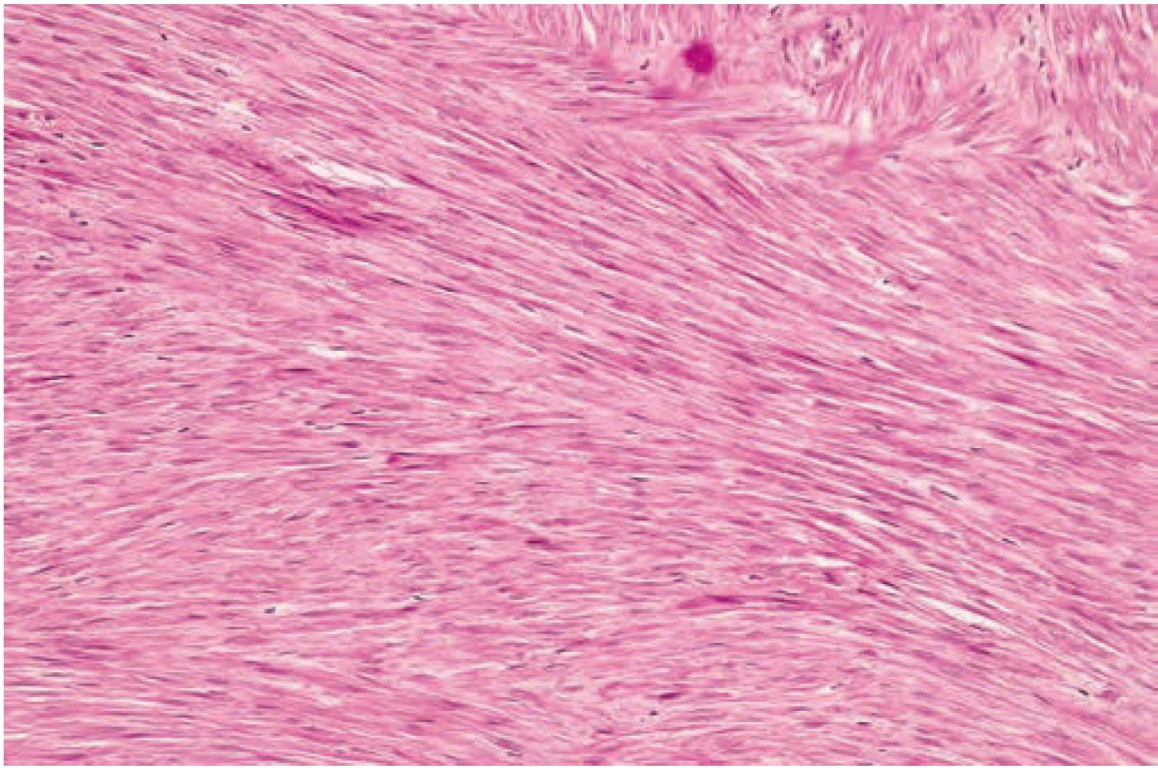
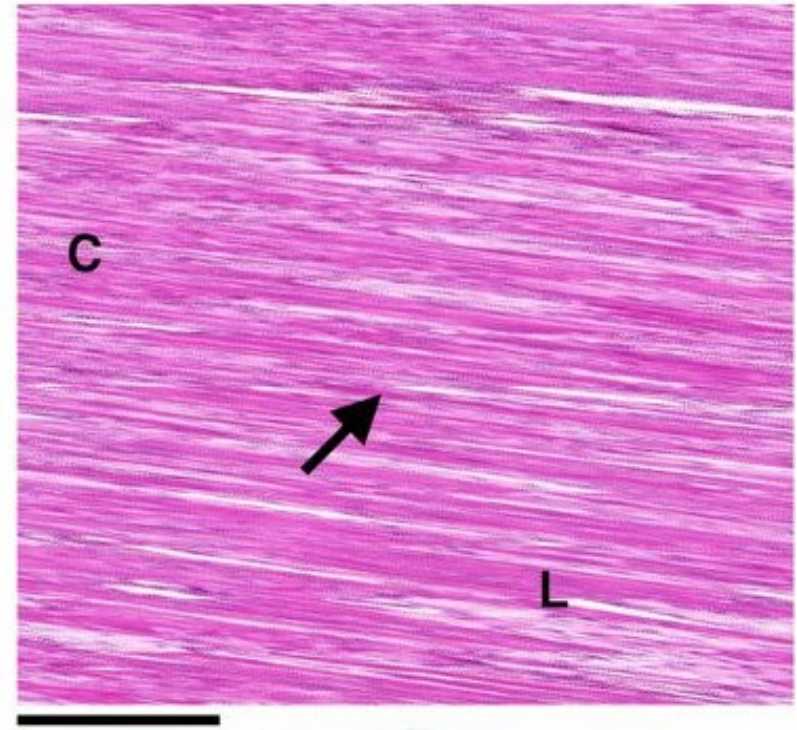


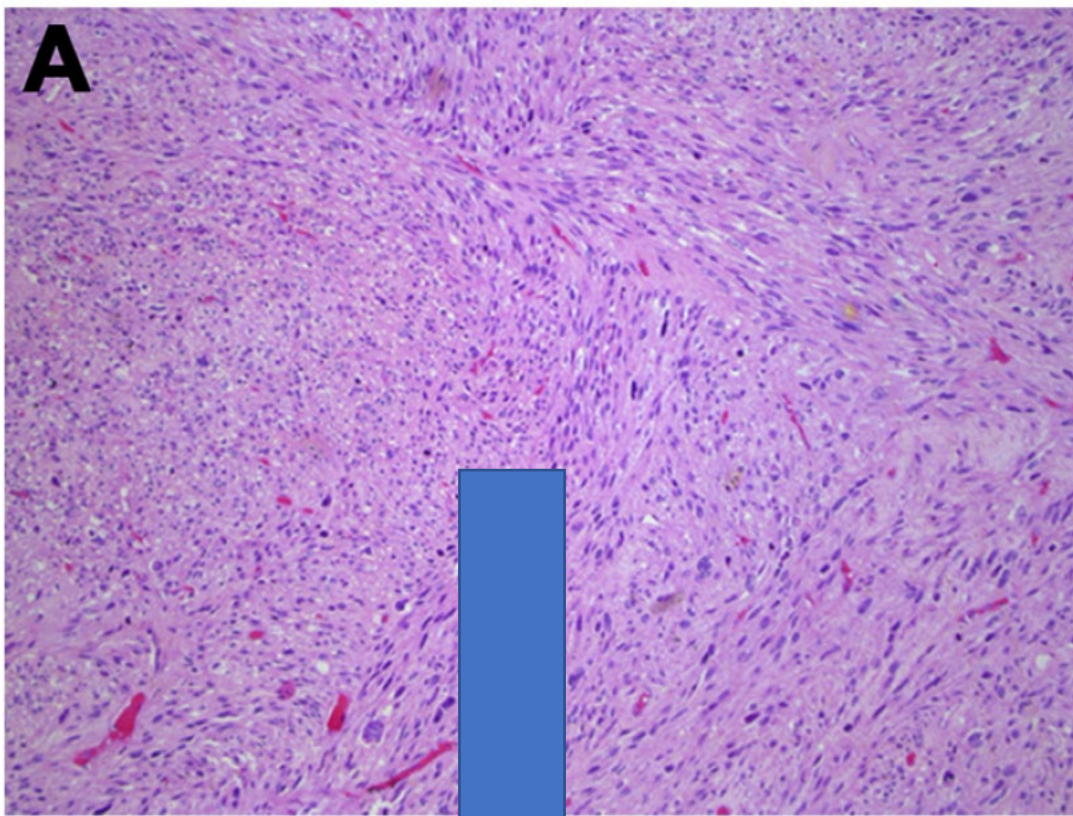
Figure 7-4 Leiomyoma of the uterus. This benign, well-differentiated tumor contains interlacing bundles of neoplastic smooth muscle cells that are virtually identical in appearance to normal smooth muscle cells in the myometrium.



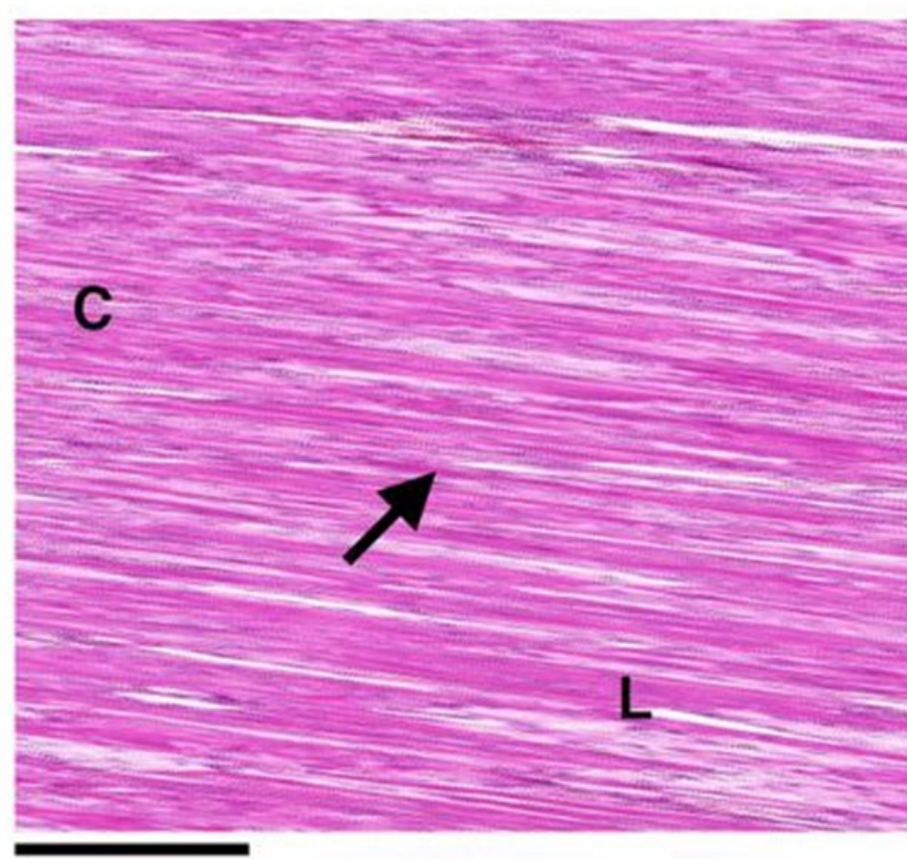
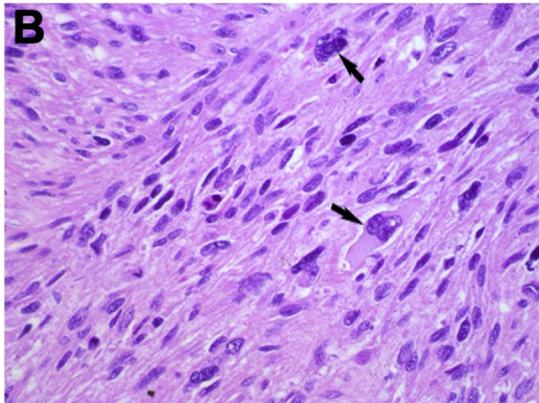
- normal

Malignant Tumors

- Malignant tumors are collectively referred to as cancers, derived from the Latin word for crab, because they tend to adhere to any part that they seize on in an obstinate manner.
- Malignant tumors can invade and destroy adjacent structures and spread to distant sites (metastasize) to cause death. Not all cancers pursue so deadly a course.
- Some are discovered early enough to be excised surgically or are treated successfully with chemotherapy or radiation, but the designation malignant always raises a red flag.



- Malignant tumor Leiomyosarcoma muscle



normal uterine smooth

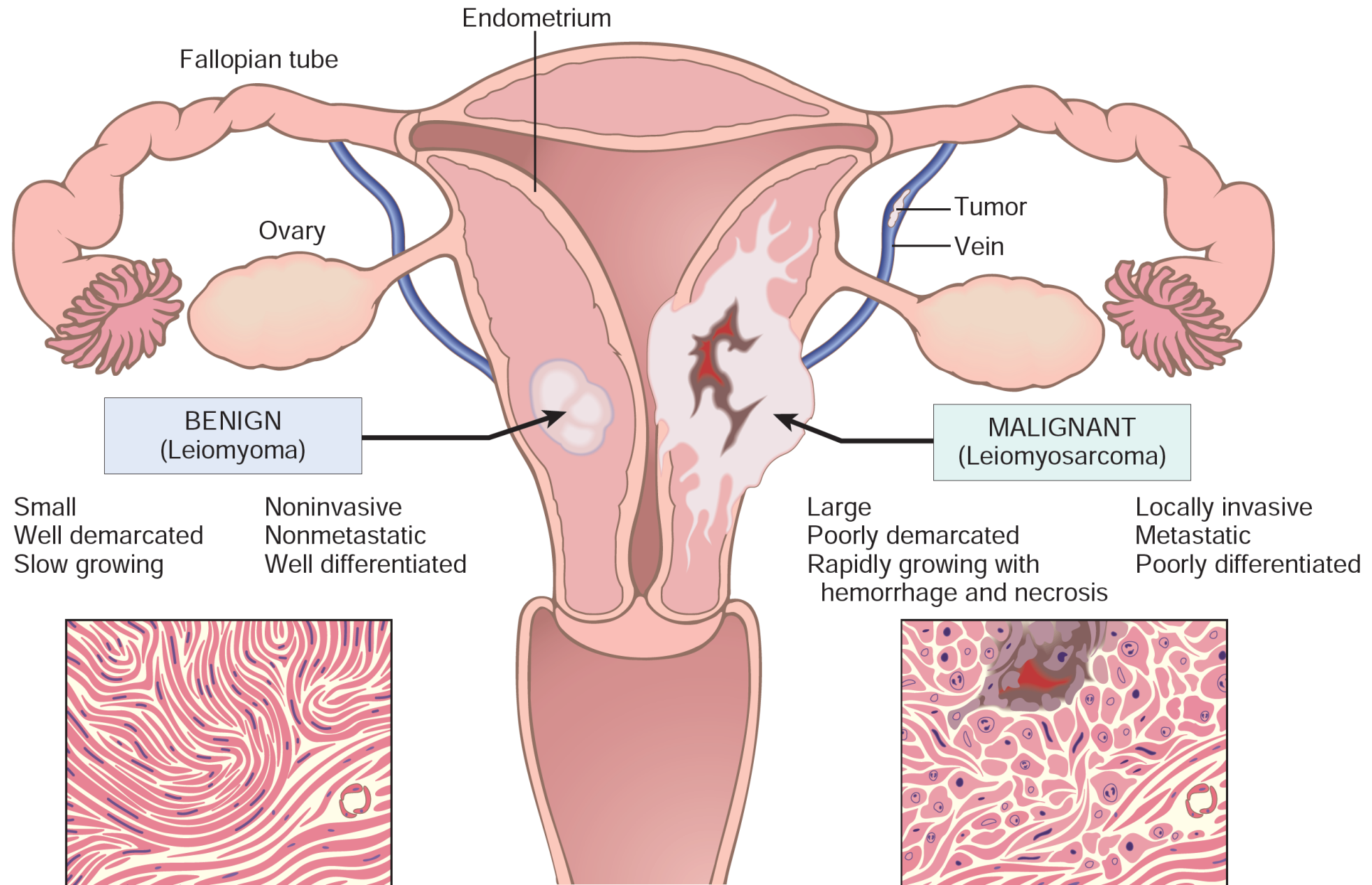


Figure 7-19 Comparison between a benign tumor of the myometrium (leiomyoma) and a malignant tumor of the same origin (leiomyosarcoma).

- The nomenclature of malignant tumors essentially follows the same schema used for benign neoplasms, with certain additions.
- Malignant tumors arising in solid mesenchymal tissues are usually called sarcomas (Greek sar = fleshy; e.g., fibrosarcoma, chondrosarcoma, leiomyosarcoma, and rhabdomyosarcoma),
- whereas those arising from blood-forming cells are designated leukemias (literally, white blood) or lymphomas (tumors of lymphocytes or their precursors).
- Malignant neoplasms of epithelial cell origin, are called carcinomas.
- Carcinomas may be further qualified.
- adenocarcinoma denotes a lesion in which the neoplastic epithelial cells grow in a glandular pattern.

Characteristics of Benign and Malignant Neoplasms

- Benign and malignant tumors can be distinguished from one another based on the degree of differentiation, rate of growth, local invasiveness, and distant spread.
- Benign tumors resemble the tissue of origin and are well differentiated; malignant tumors are less well differentiated or completely undifferentiated (anaplastic).
- Benign tumors are more likely to retain functions of their cells of origin, whereas malignant tumors sometimes acquire unexpected functions due to derangements in differentiation.
- Benign tumors are slow growing, while malignant tumors generally grow faster.
- Benign tumors are circumscribed and have a capsule; malignant tumors are poorly circumscribed and invade surrounding normal tissues.
- Benign tumors remain localized at the site of origin, whereas malignant tumors metastasize to distant sites.