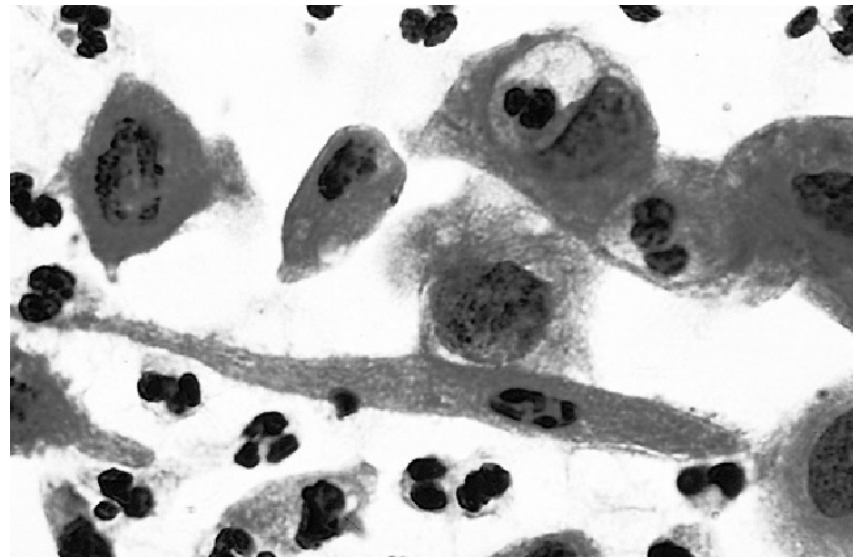


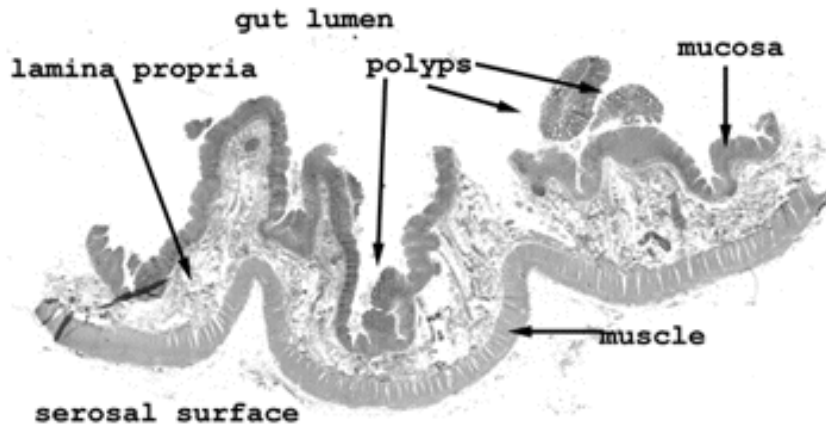
## General and Systemic Histopathology C601 and C602

### Section 4 *Neoplastic Disease*

In this laboratory, we are looking at the differences between cells that exhibit normal cell growth and those that have unregulated or altered growth. It's not the purpose to study the individual malignancies, rather the process and general histologic appearance. The term "neoplasia" does not necessarily imply malignancy. It simply means "new growth." It applies to both benign and malignant processes. When you have finished this laboratory, you should know what is meant by the terms: metaplasia, dysplasia and malignancy. In dealing with cytological aspects of malignant cells, we talk about the nuclear/cytoplasmic ratio as well as nuclear hyperchromasia and angulation of the nuclear margins, nuclear molding as well as the mitotic count. These are terms you will need to be familiar with. On the histologic level, you will encounter terms such as: gland within gland. Be sure you can define terms such as carcinoma, sarcoma and adenocarcinoma.

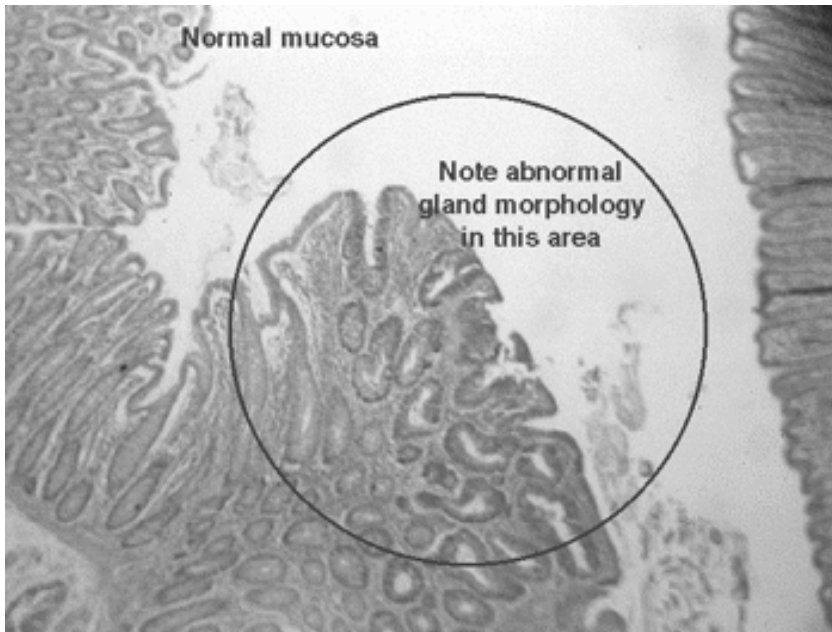


**Slide 21: Familial polyposis of the colon.**



**Your Observations**

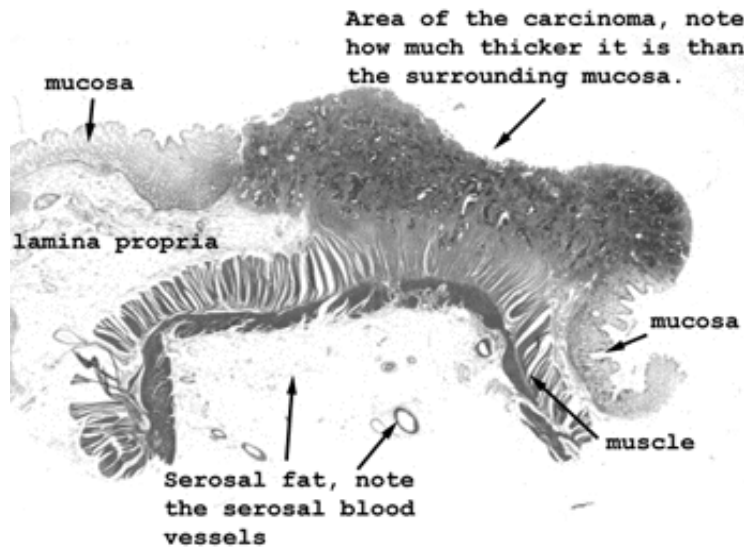
The changes are subtle here. You really must look at the tissue on the slide before going to the microscope. You will see little areas of thickening of the mucosa and that's about it. In some areas there may even be a polypoid formation but the earliest changes are not easy to see.



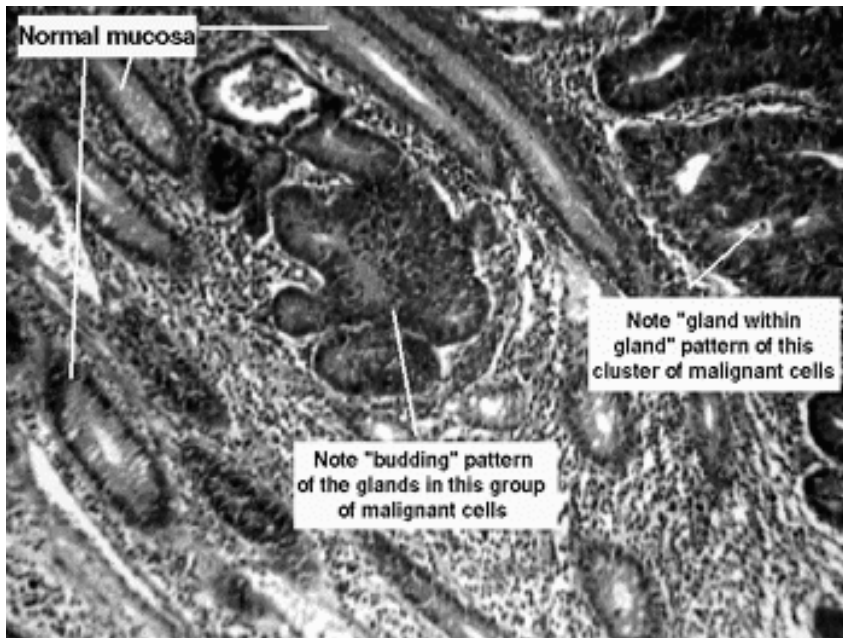
This slide shows the subtle changes in the bowel mucosa that can lead to big troubles later. You will need to be on low power to initially identify the mucosal areas of abnormality. Once you go to higher power, note the "branching" margins of the glands of the polyps and the "piling up" of the epithelium. You should have no trouble finding mitotic figures even though these lesions are benign. This congenital condition often leads to cancer of the colon later in life. Cancers of glandular origin are called adenocarcinomas, and frequently have histologic patterns similar to the organ in which they arose. To reemphasize the point, however, what we are looking at here is benign.

**Slide 32: Adenocarcinoma of rectum**

**Your Observations**

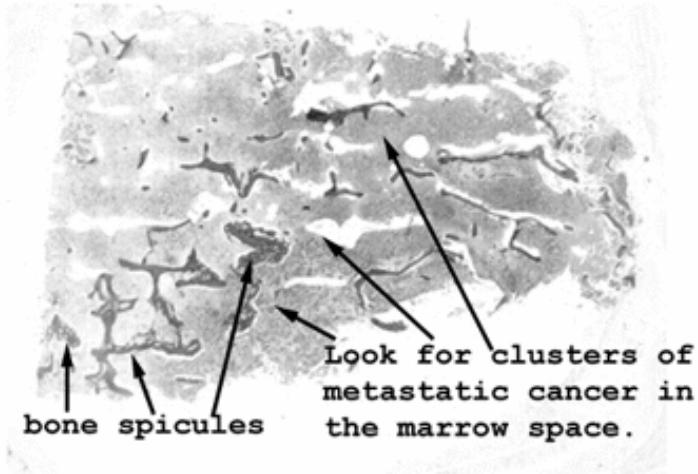


Here the region of the tumor is pretty obvious. Look to see how it is spreading at the lateral and deep margins. If we assume no node or distant metastasis what would the Dukes classification of this lesion be? What of the TMN classification?



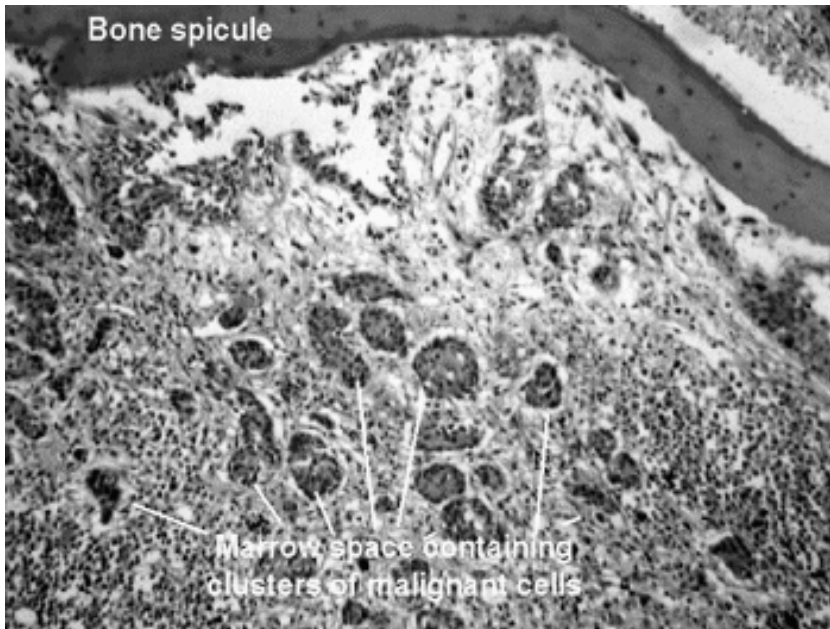
This is a fairly high power view of the cancer with normal tissue at the edges. On low power, you should be able to readily spot the different types of mucosa. In the area of the cancer, observe the "branching and arborizing" gland margins as well as the "gland within gland" pattern of the malignant cells. See what we mean by "nuclear atypia" of the epithelial cells. They are hyperchromatic with irregular nuclear staining and "angulated" nuclear margins. Mitoses are every place. Note the spread into the lamina propria of the malignant cells. Can you think of conditions that are associated with an increased incidence of this condition?

**Slide 23: Metastatic transitional cell carcinoma**



Note how "meaty" the bone marrow space is. Much of the hematopoietic space has been replaced by scar tissue and tumor.

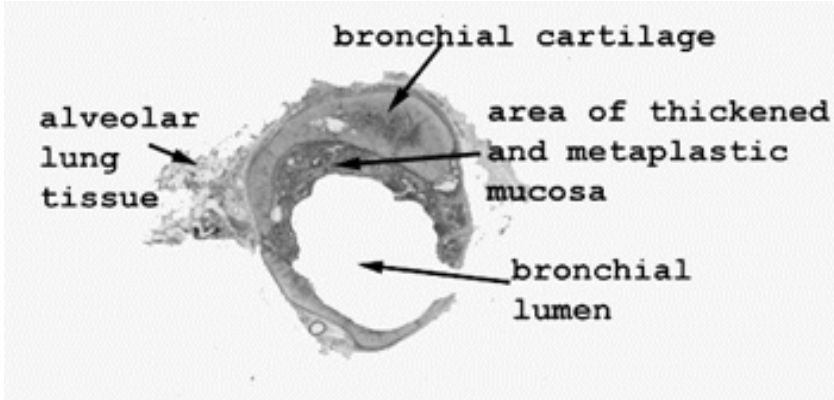
**Your Observations**



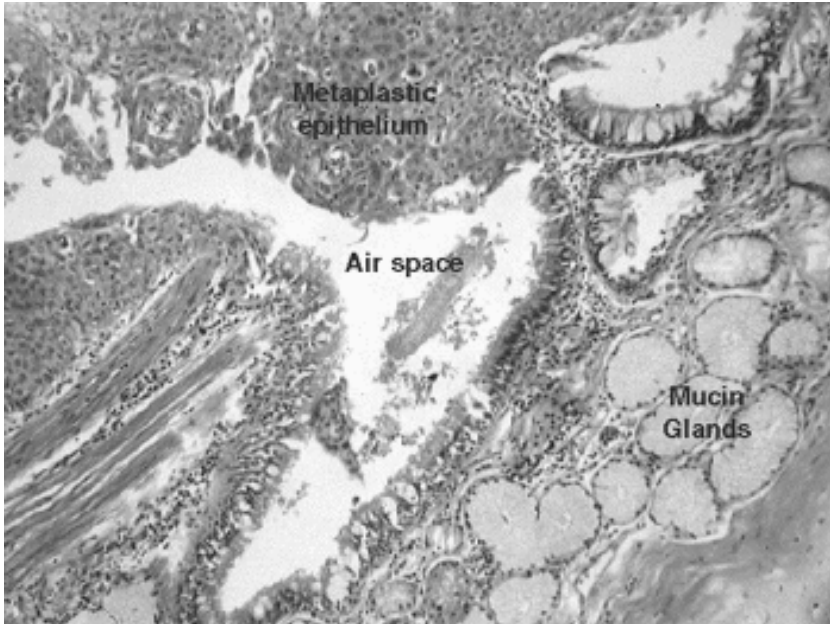
This slide shows metastatic "transitional cell carcinoma" in the bone marrow. What are the sources of "transitional cell carcinoma?" First, try to get oriented by finding some bone spicules and hematopoietic tissue. The malignant cells occur in clusters and closely resemble malignant squamous cells. Although these cells don't look too wild, they are not in the right place. Observe the "desmoplasia" (i.e. fibrosis) associated with the groups of tumor cells.

**Slide 64: Squamous metaplasia of bronchial mucosa**

**Your Observations**

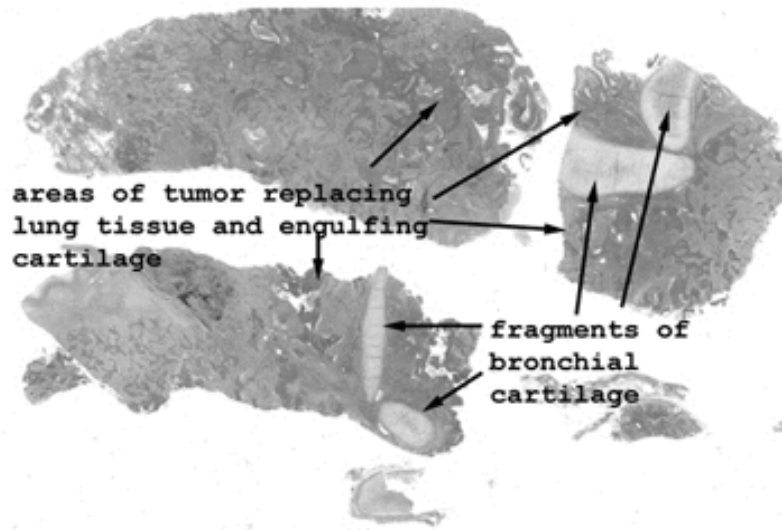


The process of metaplasia is found intermixed with the typical ciliated columnar epithelium. This is a reactive or adaptive process and not a true malignancy. What is the definition of metaplasia?



This picture is of bronchial mucosa, showing the reactive replacement of one type of epithelium for another. It is technically not a neoplastic process, although continued injury of the sort that lead to the metaplasia, can lead to dysplasia and possibly cancer. Here we see respiratory epithelium being replaced by squamous. Smoking was the injury that led to this alteration. Observe the inflammatory reaction beneath the mucosa.

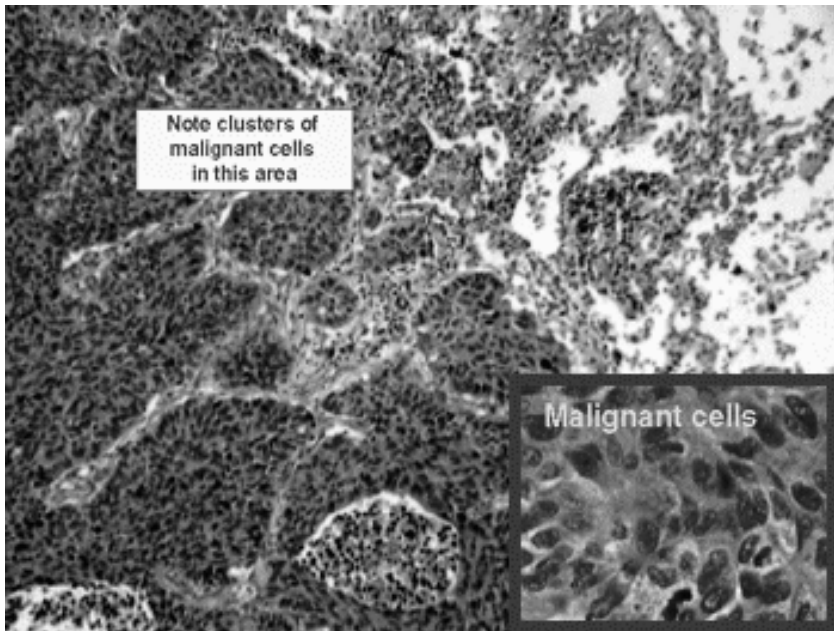
**Slide 101: Squamous cell carcinoma of lung**



**Your Observations**

Very little alveolar lung is to be found on this slide. The tumor has pretty much replaced everything in the region of the sample. Note how the tumor surrounds and encases the fragments of bronchial cartilage.

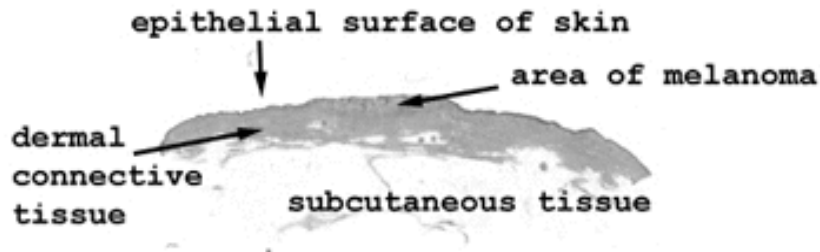
This slide shows a typical squamous cell carcinoma of the lung. Mitotic figures will be common and some "tripolar" mitoses might be present. You should be able to spot the "intercellular bridges" (as opposed to the Madison County type) that characterize squamous cell malignancies. You will see great variation in size of cells and nuclei, but the basics of malignant nuclear features are all here: nuclear/cytoplasmic ratio, angulated nuclear margins and nuclear hyperchromasia. The type of epithelium that gave rise to this malignancy is not normally found in the lung, where do you think it came from?



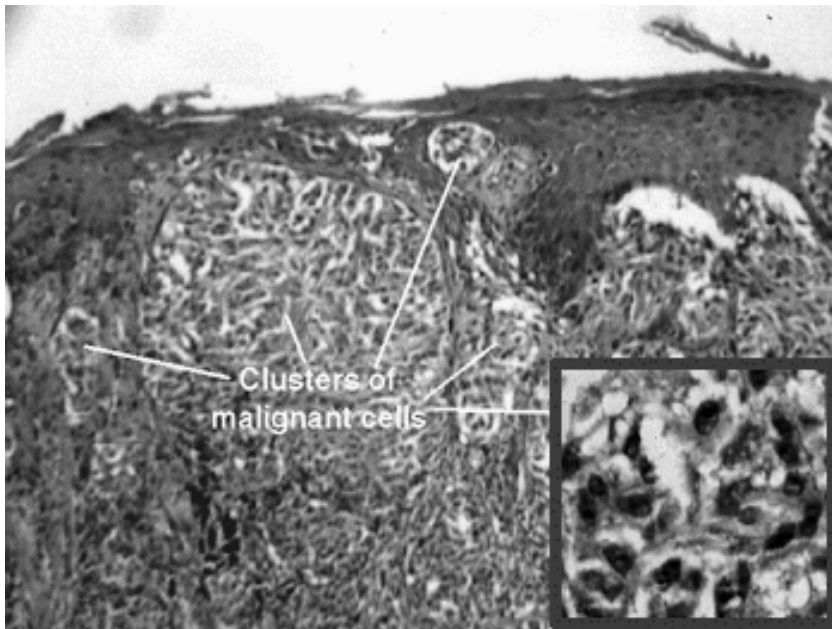
The insert shows a higher power view of the squamous cell malignancy. The nuclear atypia and mitotic figures are pretty evident.

**Slide 116: Skin with malignant melanoma**

**Your Observations**



Although this is just a little shave biopsy of skin, you can easily see the central area of thickening where the melanoma is.



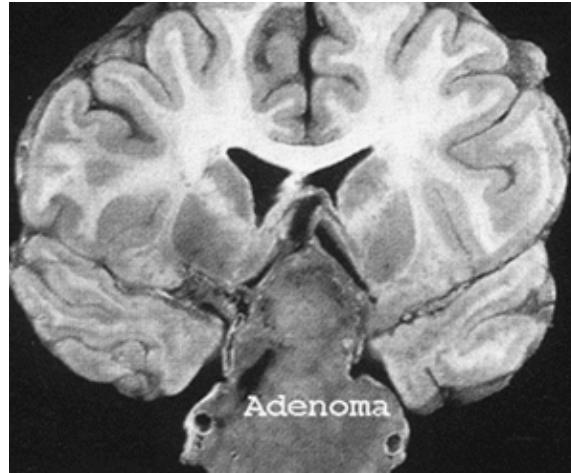
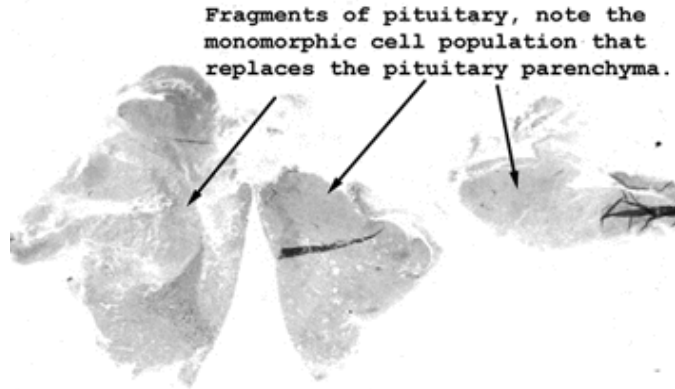
The skin in this slide shows clusters of malignant melanocytes in the dermis. Observe the lack of "cohesion" of the cells. Nuclear features of malignancy should be obvious, and many cells will show abundant pigment. There is no "maturation from surface to base" in this lesion, an important consideration in distinguishing this from its benign counterpart, a "nevus." Depth of penetration is a critical part of "staging" this lesion.

A higher power view of one of the clusters of malignant melanocytes is seen in the insert. Here you can see the lack of cohesion of the cells and the rather marked degree of nuclear atypia.

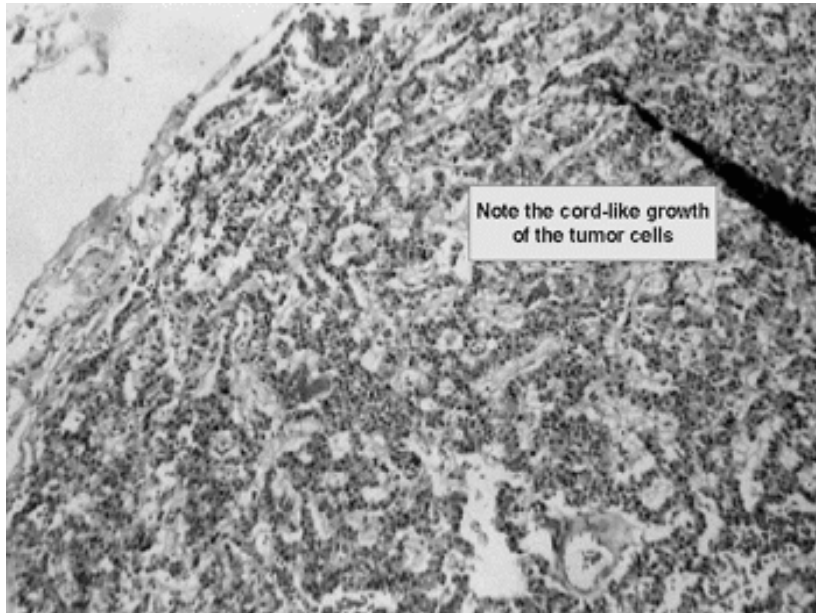


**Slide 149: Pituitary adenoma**

**Your Observations**



This gross photo of the brain with the adenoma was initially published in *Laboratory Medicine*, volume 29, number 10, 612. It had been submitted as one of the photographs in the 1998 Art and Science of Medicine Photography contest. It was taken and submitted by Dr. James M. Gulizia of Brigham and Women's Hospital, Boston.

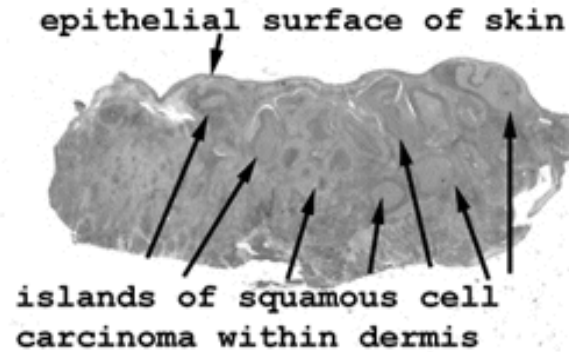


This picture is of a "benign" pituitary adenoma. Although biologically benign, it is sure in the wrong place and can be lethal just because of its location. You will see clusters and cords of the tumor cells, and it may be tricky to distinguish the tumor from the surrounding normal pituitary. Does the term "tumor" apply here? You should see no mitoses.

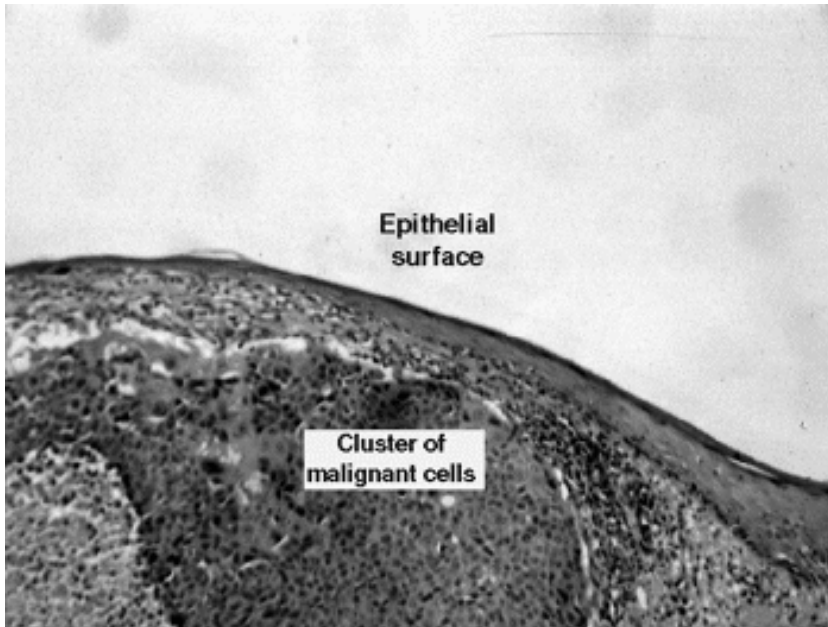


**Slide 157: Skin with recurrent squamous cell carcinoma**

**Your Observations**

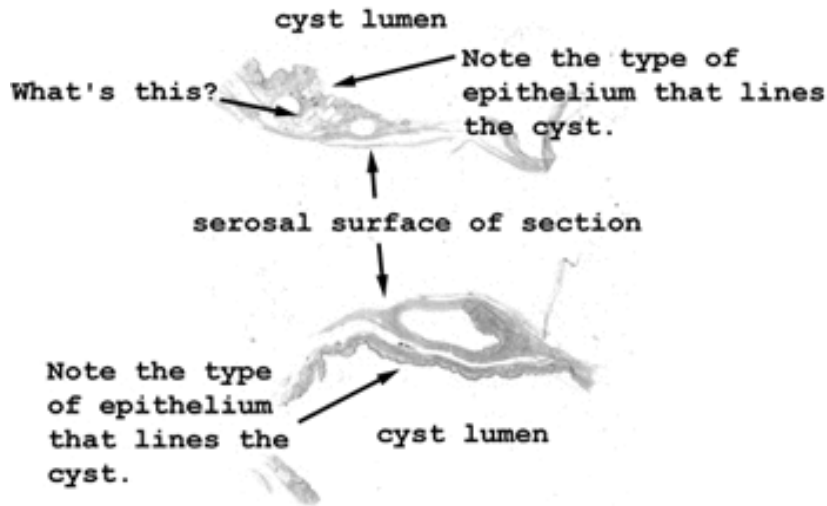


Here you see the groups of malignant cells within the dermis but seemingly having no connection to the epidermis. What's the explanation?



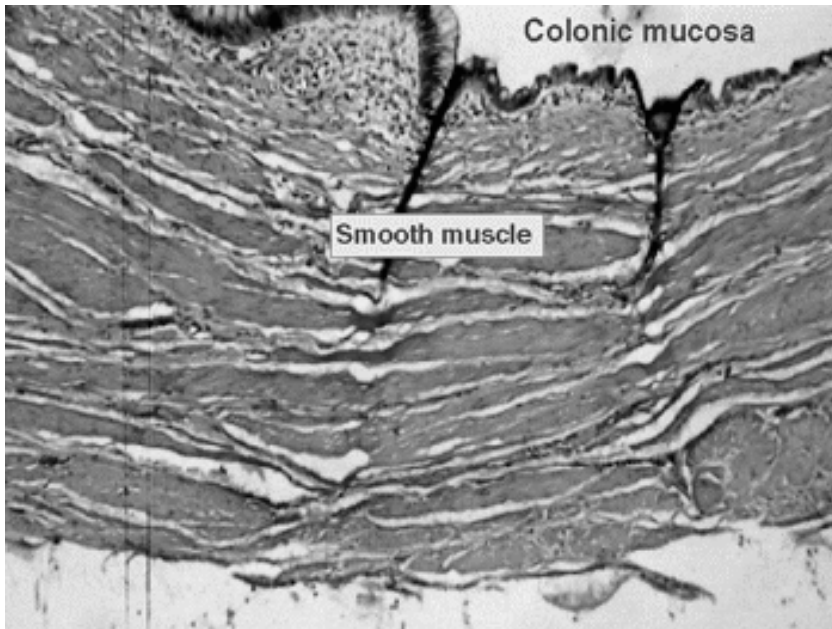
The picture of this slide could be in focus a little better, but it's what we have. Note the epithelium does not show changes of nuclear atypia nor cancer. The squamous cancer is in the dermis, and represents a recurrence from a previously removed malignancy. On your slide, you should be able to see the hallmark nuclear features of cancer i.e. angulated nuclear margins, hyperchromasia and reduced nuclear to cytoplasmic ratio. Look for "intracellular" bridges between the malignant cells.

**Slide 159: Teratoma of ovary**



**Your Observations**

This tissue just looks like little nondescript strips of tissue, but if you look far enough you may actually find a bit of ovarian tissue to help you get oriented. But, on the other hand, maybe there's not any on your slide. If that's the case, you'll just have to believe me that ovary is the origin. What you will see are a great number of different tissue types lining the cyst and within the cyst wall. I realize it may be a bit bewildering, but these are fairly common benign tumors.



This is a rather peculiar, yet common and almost always benign tumor of the ovary. It often has several "germ lines" present, giving a hodge-podge appearance of "mature" tissue types. This picture is from an area with pretty representative benign colonic mucosa and bowel wall. You will likely find other tissue types in your slide. Be sure you cruise your slide and are able to identify the ovarian tissue from which this lesion arose.