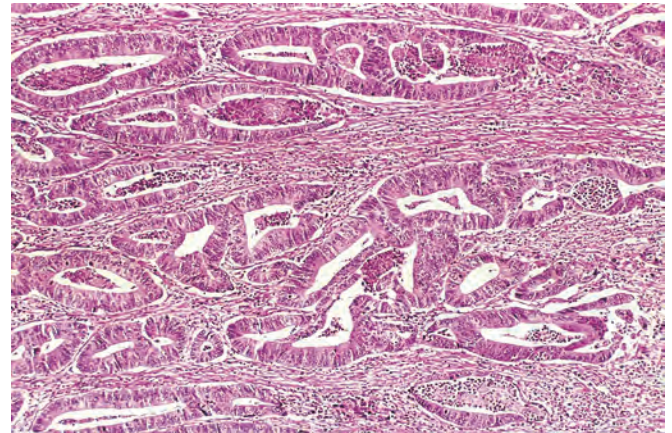


**Figure 7-4** Leiomyoma of the uterus. This benign, well-differentiated tumor contains interlacing bundles of neoplastic smooth muscle cells that are virtually identical in appearance to normal smooth muscle cells in the myometrium.



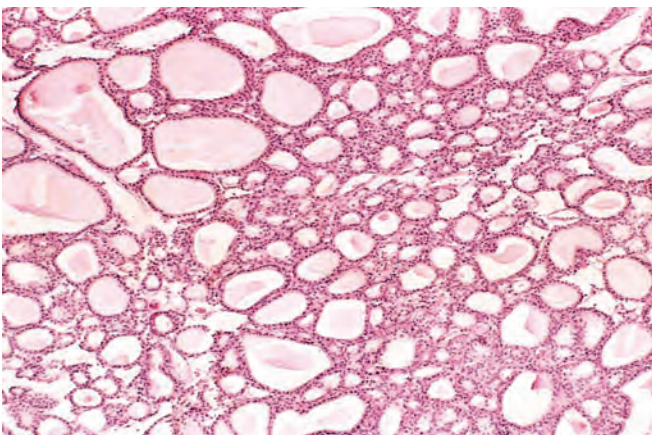
**Figure 7-6** Malignant tumor (adenocarcinoma) of the colon. Note that compared with the well-formed and normal-looking glands characteristic of a benign tumor (Fig. 7-5), the cancerous glands are irregular in shape and size and do not resemble the normal colonic glands. This tumor is considered differentiated because gland formation is seen. The malignant glands have invaded the muscular layer of the colon. (Courtesy Dr. Trace Worrell, University of Texas Southwestern Medical School, Dallas, Texas.)

parenchymal cells, both morphologically and functionally; lack of differentiation is called *anaplasia*. In general, benign tumors are well differentiated (Figs. 7-4 and 7-5). The neoplastic cell in a tumor of benign adipocytes—a lipoma—so closely resembles normal adipocytes that it may be impossible to recognize the tumor by microscopic examination of individual cells. Only the growth of these cells into a discrete mass discloses the neoplastic nature of the lesion. One may get so close to the tree that one loses sight of the forest. In well-differentiated benign tumors, mitoses are usually rare and are of normal configuration.

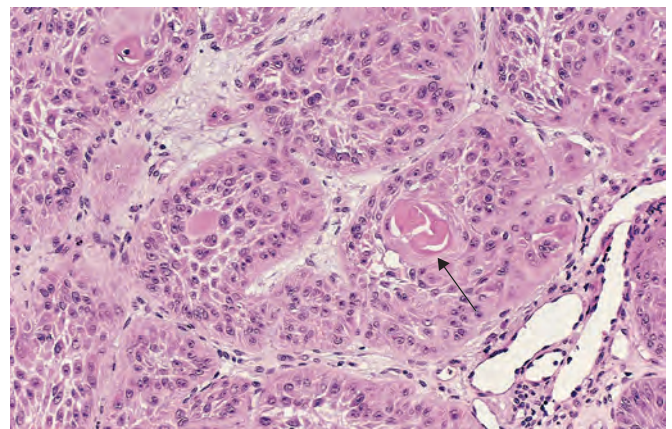
In contrast, while malignant neoplasms exhibit a wide range of parenchymal cell differentiation, most exhibit morphologic alterations that betray their malignant nature (Fig. 7-6). There are exceptions, however. At one end of the spectrum, certain well-differentiated adenocarcinomas of the thyroid, for example, form normal-appearing

follicles, and some squamous cell carcinomas contain cells that appear identical to normal squamous epithelial cells (Fig. 7-7). Thus, the morphologic distinction between well-differentiated malignant tumors and benign tumors may be quite subtle. At the other end of the spectrum lie tumors exhibiting little or no evidence of differentiation (Fig. 7-8). In between the two extremes lie tumors that are loosely referred to as moderately well differentiated.

Malignant neoplasms that are composed of poorly differentiated cells are said to be *anaplastic*. Lack of differentiation, or *anaplasia*, is considered a hallmark of malignancy. The term *anaplasia* means “to form backward,” implying a reversal of differentiation to a more primitive level. Whether cancers in fact arise from “reverse



**Figure 7-5** Benign tumor (adenoma) of the thyroid. Note the normal-looking (well-differentiated), colloid-filled thyroid follicles. (Courtesy Dr. Trace Worrell, University of Texas Southwestern Medical School, Dallas, Texas.)



**Figure 7-7** Well-differentiated squamous cell carcinoma of the skin. The tumor cells are strikingly similar to normal squamous epithelial cells, with intercellular bridges and nests of keratin pearls (arrow). (Courtesy Dr. Trace Worrell, University of Texas Southwestern Medical School, Dallas, Texas.)