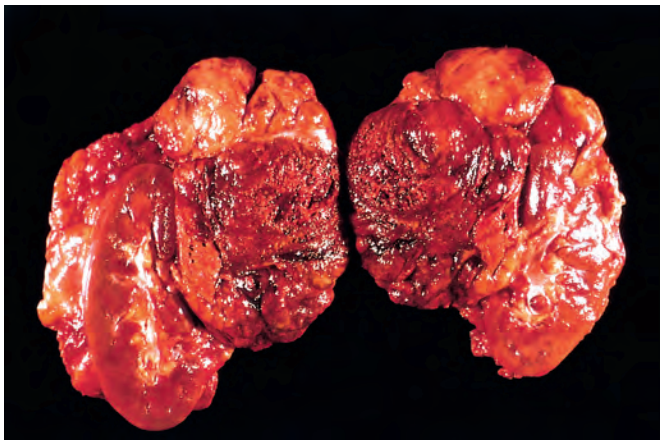

Figure 24-52 Adrenal carcinoma. The hemorrhagic and necrotic tumor dwarfs the kidney and compresses the upper pole.

the lungs and other viscera. The median patient survival is about 2 years.

Microscopically, adrenocortical carcinomas may be composed of well-differentiated cells, resembling those seen in cortical adenomas, or bizarre, monstrous giant cells (Fig. 24-53), which may be difficult to distinguish from those of an undifferentiated carcinoma metastatic to the adrenal. Between these extremes are found cancers with moderate degrees of anaplasia, some composed predominantly of spindle cells. Carcinomas, particularly those of bronchogenic origin, may metastasize to the adrenals, and may be difficult to differentiate from primary cortical carcinomas. Of note, metastases to the adrenal cortex are significantly more common than primary adrenocortical carcinomas.

Other Adrenal Lesions

Adrenal cysts are relatively uncommon; however, with the use of sophisticated abdominal imaging techniques, the frequency of detection of these lesions is increasing. Larger cysts may produce an abdominal mass and flank pain. Both cortical and medullary neoplasms may undergo necrosis and cystic degeneration and may present as "nonfunctional cysts."

Adrenal myelolipomas are unusual benign lesions composed of mature fat and hematopoietic cells. Although most of these lesions represent incidental findings, occasional myelolipomas may reach massive proportions. Histologically, mature adipocytes are admixed with aggregates of hematopoietic cells belonging to all three lineages. Foci of myelolipomatous change may be seen in cortical tumors and in adrenals with cortical hyperplasia.

The term *adrenal incidentaloma* is a half-facetious moniker that has crept into the medical lexicon as advancements in medical imaging have led to the incidental discovery of adrenal masses in asymptomatic individuals or in individuals in whom the presenting complaint is not directly related to the adrenal gland. The estimated population prevalence of "incidentalomas" discovered by imaging is approximately 4%, with an age-dependent increase in prevalence. Fortunately, the vast majority of adrenal incidentalomas are small nonsecreting cortical adenomas of no clinical importance.

Adrenal Medulla

The adrenal medulla is developmentally, functionally, and structurally distinct from the adrenal cortex. It is composed of specialized neural crest (neuroendocrine) cells, termed *chromaffin* cells, and their supporting (sustentacular) cells. The adrenal medulla is the major source of catecholamines (epinephrine, norepinephrine) in the body. Neuroendocrine cells similar to chromaffin cells are widely dispersed in an extra-adrenal system of clusters and nodules that, together with the adrenal medulla, make up the *paraganglion system*. These extra-adrenal paraganglia are closely associated with the autonomic nervous system and can be divided into three groups based on their anatomic distribution: (1) branchiomeric, (2) intravagal, and (3) aorticosympathetic. The branchiomeric and intravagal paraganglia associated with the parasympathetic system are located close to the major arteries and cranial nerves of the head and neck and include the carotid bodies (Chapter 16). The intravagal

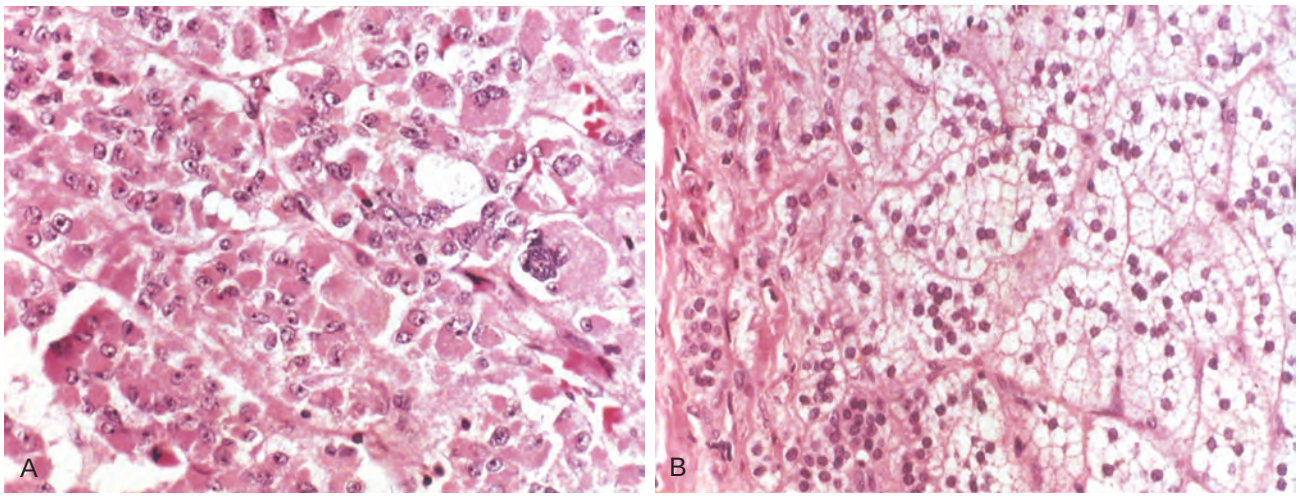

Figure 24-53 Adrenal carcinoma (**A**) revealing marked anaplasia, contrasted with normal adrenal cortical cells (**B**).