even when they are small. Symptoms caused by low-grade primary brain tumors tend to be slowly progressive whereas those in mid-grade and high-grade histology are acute or subacute (over weeks to months). The exception is the clinical presentation of a low-grade glioma with seizure. Metastatic tumors often present in a subacute fashion but may present acutely when hemorrhage into the tumor occurs. Hemorrhage into metastatic brain tumors is most common with renal cell, melanoma, lung, and choriocarcinomas.

The clinical symptoms and signs depend on the location of tumor. In most pediatric patients with brain tumor, tumors arise in the posterior fossa and result in diplopia, ataxia, dysphagia, or nausea/vomiting. Most of adult brain tumors arise in the cerebral hemispheres and present with symptoms and signs related or supratentorial structure involved: unilateral limb weakness, aphasia, and memory loss are common. Tumors in either location may present with generalized symptoms arising from increased intracranial pressure or meningeal irritation. Headache occurs in up to two thirds of patients as a presenting sign. There are no characteristics unique to this headache, but useful clinical clues include a new or different headache pattern, a progressively worsening headache, and one that occurs at night or on awakening. The pain may localize to the side of the tumor in patients with supratentorial tumors, whereas patients with infratentorial tumors frequently describe pain in the retro-orbital, retroauricular, or occipital region. Other generalized symptoms include changes in mood or personality, a decrease in appetite, and nausea. Projectile vomiting, common in children with posterior fossa tumors, is rare in adults. Meningiomas generally grow slowly; they may also be found incidentally during the evaluation of unrelated neurologic symptoms. Seizures are a frequent presenting sign of low-grade gliomas. Seizures may develop over the course of the illness in a high percentage of other patients with glioma, often in association with tumor progression.

DIAGNOSIS/DIFFERENTIAL

All patients suspected of having a brain tumor should undergo a contrast-enhanced magnetic resonance imaging (MRI) brain scan. If MRI is not available or is contraindicated because of a pacemaker or other condition, brain computed tomography (CT) should be obtained. Brain MRI is preferred because it is more useful in imaging the temporal and posterior fossae and it is more sensitive in detecting the extent of parenchymal involvement by tumor of any type. In addition, advanced sequences such as diffusion, perfusion, and spectroscopy add to the diagnostic accuracy of imaging. Vasogenic edema resulting from leakage of intravascular fluid through a disrupted blood-brain barrier can accompany any type of brain tumor and is easily visible on MRI.

High-grade gliomas typically appear as irregularly shaped contrast-enhancing masses surrounded by edema. Central necrosis is characteristic of glioblastoma (Fig. 119-1). Anaplastic gliomas appear similar, except for less frequent tumor necrosis. Although there are exceptions, most low-grade gliomas do not enhance after intravenous contrast injection (Fig. 119-2). Meningiomas typically demonstrate smooth and homogeneous enhancement originating from the extra-axial space and may also compress adjacent brain. PCNSLs typically present as multiple contrast-enhancing lesions within the white matter but in rare instances do not show contrast enhancement. Brain metastases are often located at the grey-white junction of the brain and demonstrate homogeneous enhancement or peripheral enhancement surrounding a necrotic center. When single, a brain metastasis cannot be accurately distinguished from other neoplasm or non-neoplastic entities. Medulloblastomas are usually large by the time they are identified and demonstrate homogeneous enhancement within or superior to the floor of the fourth

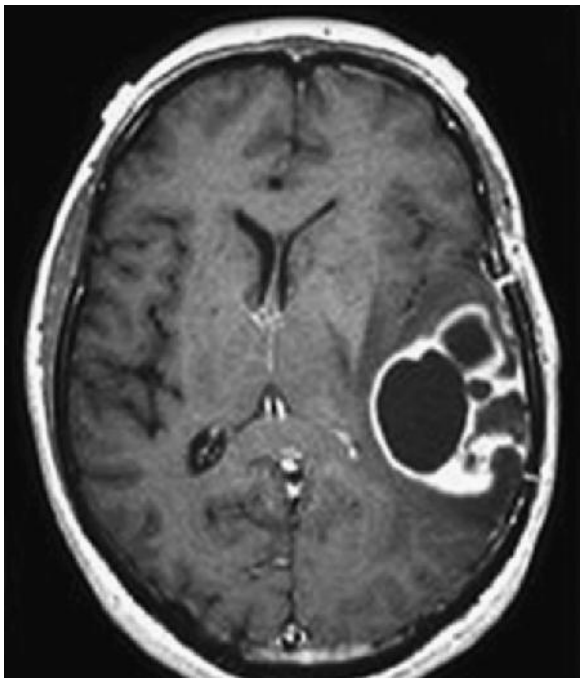

FIGURE 119-1 Contrast-enhanced T1-weighted MRI demonstrates irregular contrast enhancement with central necrosis in the left temporal lobe. There is adjacent vasogenic edema and mass effect on midline structures.

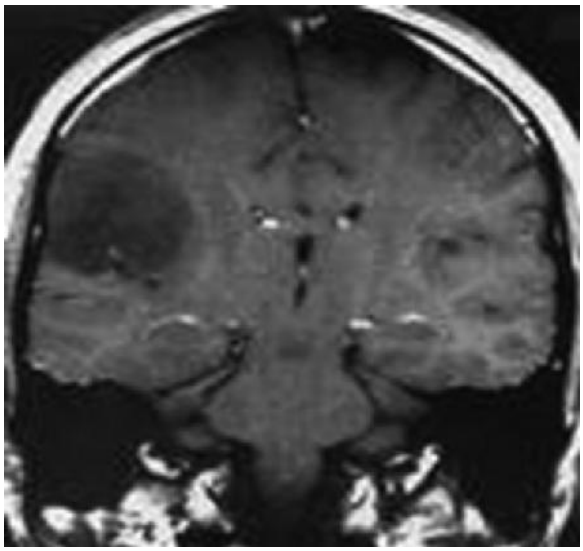

FIGURE 119-2 Coronal T-weighted MRI following contrast injection in a low-grade astrocytoma shows low attenuation and no contrast enhancement, typical of a low-grade glioma.