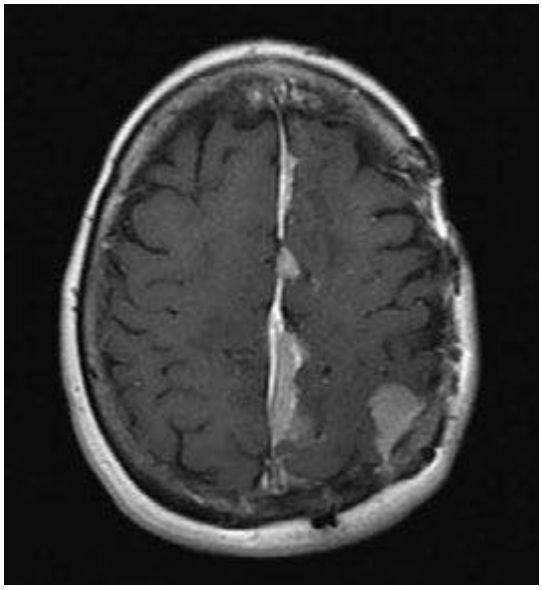

FIGURE 118-5 Postgadolinium T1 MRI demonstrating multiple meningiomas along the falx and left parietal cortex.

vestibular portion of the eighth cranial nerve and account for approximately 9% of primary brain tumors. Patients with neurofibromatosis type 2 have a high incidence of vestibular schwannomas that are frequently bilateral. Schwannomas arising from other cranial nerves, such as the trigeminal nerve (cranial nerve V), occur with much lower frequency. Neurofibromatosis type 1 is associated with an increased incidence of schwannomas of the spinal nerve roots.

Vestibular schwannomas may be found incidentally on neuroimaging or present with progressive unilateral hearing loss, dizziness, tinnitus, or less commonly, symptoms resulting from compression of the brainstem and cerebellum. On MRI they appear as densely enhancing lesions, enlarging the internal auditory canal and often extending into the cerebellopontine angle (Fig. 118-6). The differential diagnosis includes meningioma. Very small, asymptomatic lesions can be observed with serial MRIs. Larger lesions should be treated with surgery or SRS. The optimal treatment will depend on the size of the tumor, symptoms, and the patient's preference. In patients with small vestibular schwannomas and relatively intact hearing, early surgical intervention increases the chance of preserving hearing.

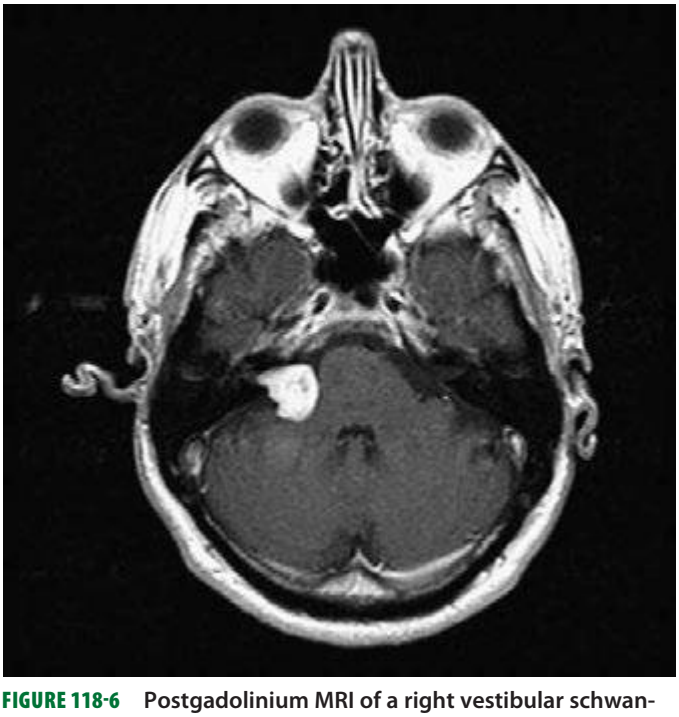

FIGURE 118-6 Postgadolinium MRI of a right vestibular schwannoma. The tumor can be seen to involve the internal auditory canal.

PITUITARY TUMORS (CHAP. 401e)

These account for approximately 9% of primary brain tumors. They can be divided into functioning and nonfunctioning tumors. Functioning tumors are usually microadenomas (<1 cm in diameter) that secrete hormones and produce specific endocrine syndromes (e.g., acromegaly for growth hormone–secreting tumors, Cushing syndrome for adrenocorticotropic hormone [ACTH]-secreting tumors, and galactorrhea, amenorrhea, and infertility for prolactin-secreting tumors). Nonfunctioning pituitary tumors tend to be macroadenomas (>1 cm) that produce symptoms by mass effect, giving rise to headaches, visual impairment (such as bitemporal hemianopia), and hypopituitarism. Prolactin-secreting tumors respond well to dopamine agonists such as bromocriptine and cabergoline. Other pituitary tumors usually require treatment with surgery and sometimes RT or radiosurgery and hormonal therapy.

CRANIOPHARYNGIOMAS

Craniopharyngiomas are rare, usually suprasellar, partially calcified, solid, or mixed solid-cystic benign tumors that arise from remnants of Rathke's pouch. They have a bimodal distribution, occurring predominantly in children but also between the ages of 55 and 65 years. They present with headaches, visual impairment, and impaired growth in children and hypopituitarism in adults. Treatment involves surgery, RT, or a combination of the two.

OTHER BENIGN TUMORS

Dysembryoplastic Neuroepithelial Tumors (DNTs) These are benign, supratentorial tumors, usually in the temporal lobe. They typically occur in children and young adults with a long-standing history of seizures. Surgical resection is curative.

Epidermoid Cysts These consist of squamous epithelium surrounding a keratin-filled cyst. They are usually found in the cerebellopontine angle and the intrasellar and suprasellar regions. They may present with headaches, cranial nerve abnormalities, seizures, or hydrocephalus. Imaging studies demonstrate extraaxial lesions with characteristics that are similar to CSF but have restricted diffusion. Treatment involves surgical resection.

Dermoid Cysts Like epidermoid cysts, dermoid cysts arise from epithelial cells that are retained during closure of the neural tube. They contain both epidermal and dermal structures such as hair follicles, sweat glands, and sebaceous glands. Unlike epidermoid cysts, these tumors usually have a midline location. They occur most frequently in the posterior fossa, especially the vermis, fourth ventricle, and suprasellar cistern. Radiographically, dermoid cysts resemble lipomas, demonstrating T1 hyperintensity and variable signal on T2. Symptomatic dermoid cysts can be treated with surgery.

Colloid Cysts These usually arise in the anterior third ventricle and may present with headaches, hydrocephalus, and, very rarely, sudden death. Surgical resection is curative, or a third ventriculostomy may relieve the obstructive hydrocephalus and be sufficient therapy.

NEUROCUTANEOUS SYNDROMES (PHAKOMATOSES)

A number of genetic disorders are characterized by cutaneous lesions and an increased risk of brain tumors. Most of these disorders have an autosomal dominant inheritance with variable penetrance.

NEUROFIBROMATOSIS TYPE 1 (NF1) (von RECKLINGHAUSEN'S DISEASE)

NF1 is an autosomal dominant disorder with an incidence of approximately 1 in 2600–3000. Approximately one-half the cases are familial; the remainder are caused by new mutations arising in patients with unaffected parents. The *NF1* gene on chromosome 17q11.2 encodes a protein, neurofibromin, a guanosine triphosphatase (GTPase)-activating protein (GAP) that modulates signaling through the ras pathway. Mutations of *NF1* result in a large number of nervous system tumors