Chapter 14
Skull Base Disorders

This subcategory of adult brain surgery generally has the following features: (1) a tumor, benign or malignant, that involves part of the skull base; (2) a complex opening that carries much higher risk than the standard craniotomy openings; (3) dissection of tumor off cranial nerves and critical blood vessels (sometimes even involving sacrifice of such blood vessels or blood vessel bypass procedures); (4) higher risk of a serious complication.

One should specifically exclude from this category minimally invasive "endoscopic endonasal approach" (EEA) procedures for removal of masses such as pituitary adenomas and clival chordomas, and standard cranial approaches to remove olfactory groove, planum sphenoidale, and sphenoid wing meningiomas. One should also exclude any non-invasive management of such problems, such as with Gamma Knife.

The risks of these "skull base operations" are often very high, and the benefits of such procedures are generally significantly less than other alternatives. The major alternative for most of these tumor cases is some form of radiation, whether Gamma Knife, hypofractionated radiosurgery (usually performed in 5 doses), or even just standard focused radiation treatment over the course of several weeks (see Figs. 14.1, 14.2, 14.3, and 14.4). There is rarely any benefit in trying to aggressively dissect a tumor off cranial nerves or critical blood vessels. Whether the tumor is benign or malignant, the tumor control will be just as good with radiosurgery, and the expected neurological deficits with be much less. It is also worth noting that most brain surgeons who specialize in "skull base surgery" (or surgery for other brain tumors, for that matter) are often not that experienced in performing stereotactic radiosurgery and thus may not fully appreciate the benefits of this much less invasive modality. Even larger skull base tumors can often be treated either with hypofractionated or staged radiosurgery techniques, or standard fractionated radiation. As an important general rule, a benign brain tumor can usually be stabilized at its current size and symptomatology with radiation alone.

M. H. Brisman, *Put Down the Knife*,
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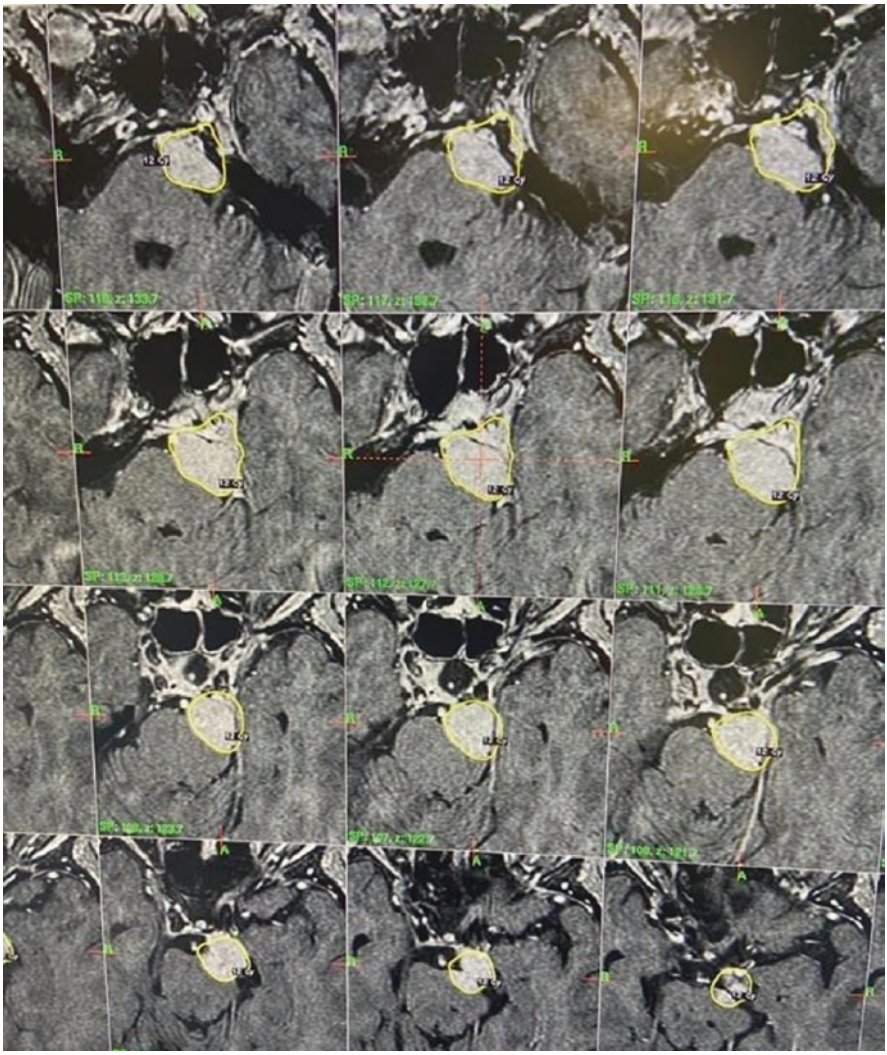

Fig. 14.1 This is a 68-year-old woman found incidentally to have a 2 cm meningioma in the left retroclival/cavernous sinus region, indenting the left anterior brainstem. She was treated with Gamma Knife (postcontrast T1 weighted axial MRI images from the time of Gamma Knife treatment)

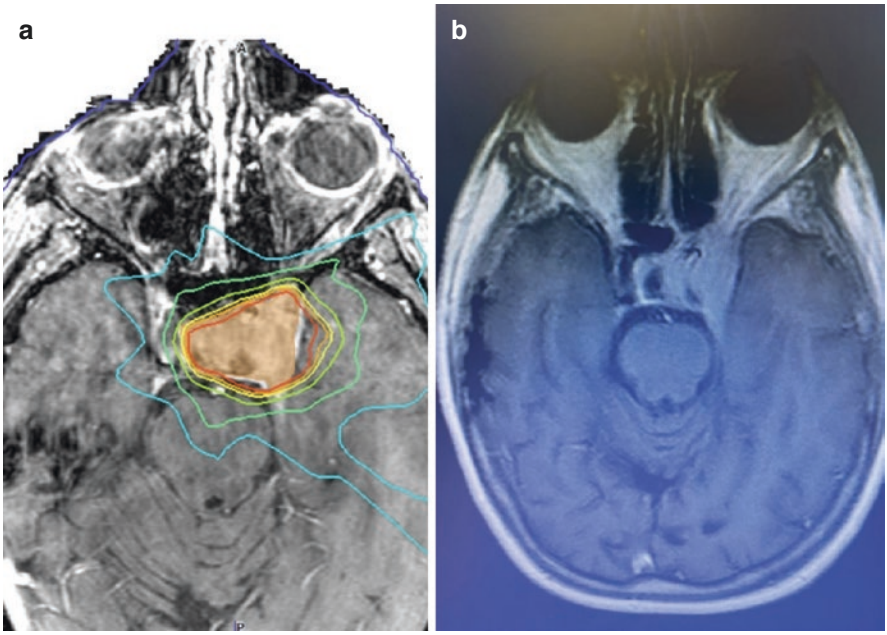

Fig. 14.2 This is a 72-year-old woman found to have an incidental left cavernous sinus meningioma that was enlarging (**a**). She was otherwise healthy. She underwent hypofractionated radiosurgery treatment performed over five sessions. Six years later, the tumor remained stable, and she remained neurologically intact (**b**)

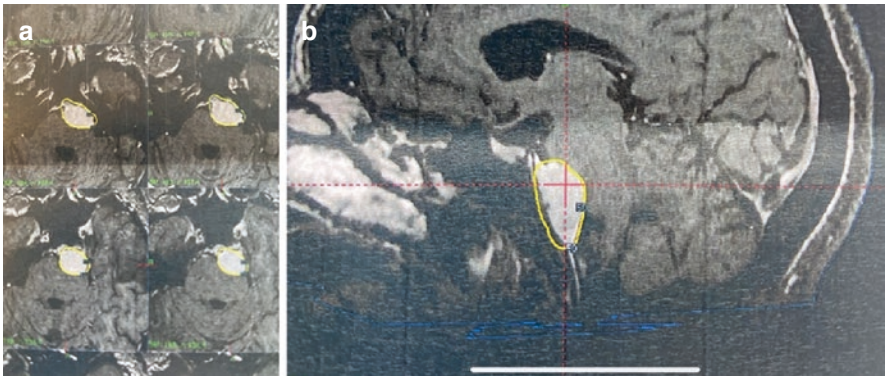

Fig. 14.3 This is a 67-year-old man incidentally discovered to have a moderate sized petroclival meningioma. He was treated uneventfully with Gamma Knife (**a**: axial MRI postcontrast images from the day of Gamma Knife treatment; **b**: sagittal MRI postcontrast image from the day of Gamma Knife treatment)

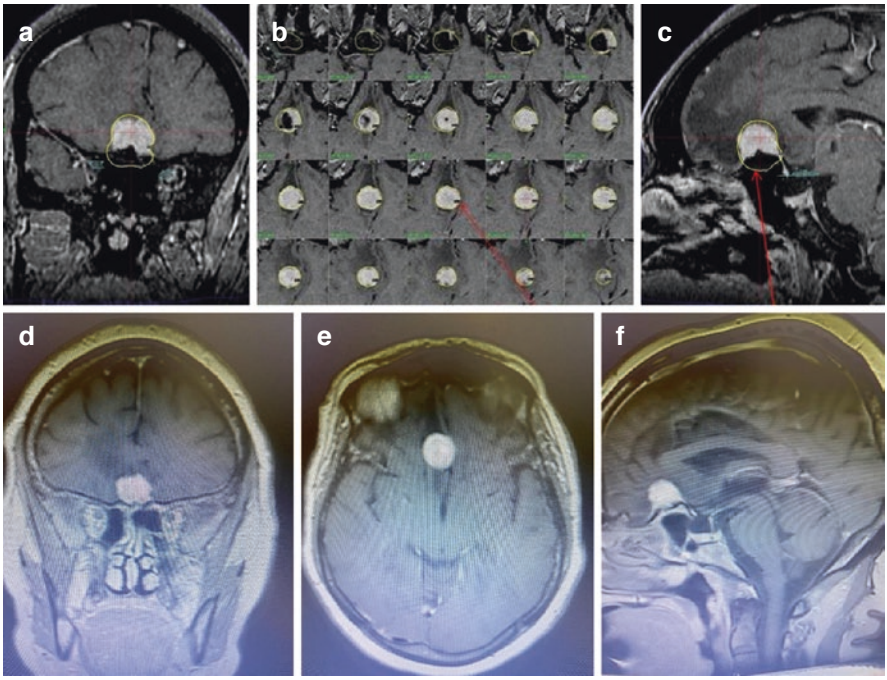

Fig. 14.4 This is a 60-year-old woman found incidentally to have a planum sphenoidale meningioma with a calcified base and some edema. The patient was treated with Gamma Knife (**a**: postcontrast T1 coronal MRI image at the time of Gamma Knife treatment; **b**: postcontrast T1 axial MRI images at the time of Gamma Knife treatment; **c**: postcontrast sagittal MRI images at the time of Gamma Knife treatment). Four years later, the patient had no symptoms, and the tumor remained stable (**d**: postcontrast T1 coronal MRI image; **e**: postcontrast T1 axial MRI image; **f**: postcontrast T1 sagittal MRI image)