36 Primary Neoplasms

Spinal neoplasias can be classified into lesions originating from the extradural, intradural extramedullary, and medullary spaces. Of the latter, astrocytomas are the most common in the cervical spine, frequently occurring in the thoracic spine as well. Astrocytomas classically span several vertebral segments in length and involve nearly the entire cross-section of the cord, the latter resulting in an expansile appearance on T1WI. Hyperintensity on T2WI reflects both the lesion and its surrounding edema. Enhancement is almost always present, to a degree, although some lesions and in particular more necrotic tumors may only enhance on delayed scans (30–60 minutes following contrast administration). Enhancement of the wall of cystic lesions aids in distinguishing them from otherwise similar appearing benign cystic lesions in the cord. Complex syrinxes too may mimic the appearance of an astrocytoma, although the walls of the latter are generally less distinct and CSF-pulsation artifacts absent. Contrast-enhanced MRI further aids in the distinction and should also be utilized in the initial workup of any syrinx without obvious cause (i.e., Chiari malformations).

Postoperatively, contrast administration is useful in differentiating nonenhancing postoperative changes from recurrent tumor, the latter almost invariably enhancing. In terms of differential diagnosis, an enhancing lesion of substantial craniocaudal extent could potentially represent cord ischemia or infarction, although this is very uncommon in the cervical spine. Unlike astrocytomas, ependymomas demonstrate a predilection for the lumbar spine; they are the most common tumor arising from the cauda equina and conus. Myxopapillary subtypes (see Chapter 51) in particular frequently originate in the lumbar spine. An example (in the cervical spine) of the more common cellular subtype is illustrated in the T2WI and contrast-enhanced T1WI of **Figs. 36.1A,B**, respectively. As shown here, ependymomas, unlike astrocytomas, are often heterogeneous on **(A)** T2WI. In this particular case, there is a **(B)** nonenhancing cyst at the most cephalad aspect of the lesion with edema extending from the lesion both rostrally and caudally as best seen on **(A)** T2WI. The cord is expanded, although somewhat more focally than would be expected with an astrocytoma, such expansion only spanning from C3–C4. Although cellular ependymomas are typically isointense to cord on precontrast T1WI, focal areas of hyperintensity secondary to subacute hemorrhage (on T1WI) or hypointensity due to hemosiderin deposition (on T2WI) may be seen. Astrocytomas hemorrhage less frequently. Ependymomas may contain foci of hypercellularity correlating with hypointensity on precontrast MRI sequences and tend to enhance more heterogeneously than astrocytomas. Involvement is also typically of a shorter segment of the cord than with an astrocytoma.

Turning to lesions that are typically smaller (and more focal), **Figs. 36.2A,B** demonstrate the appearance of a cavernous angioma on sagittal FSE T2WI and axial GRE T2WI, respectively. On the **(A)** sagittal image there is subtle cord expansion at the C2 level with the lesion demonstrating heterogeneous low SI on T2WI due to hemosiderin deposition. **(B)** The GRE T2WI, which is more sensitive to the susceptibility effects of blood products, exhibits the complete, hypointense hemosiderin rim typically associated with cavernous angiomas. Hemangioblastomas are another vascular lesion of the cervical and thoracic cord, although they are more common in the posterior fossa. Hemangioblastomas are discussed in greater detail in Chapter 51. Of intradural extramedullary lesions of the cervical cord, nerve sheath tumors and meningiomas (see Chapter 39 and 51) are most common. Like intracranial meningiomas, those of the spine tend to be found in adults. Purely extradural meningiomas may also

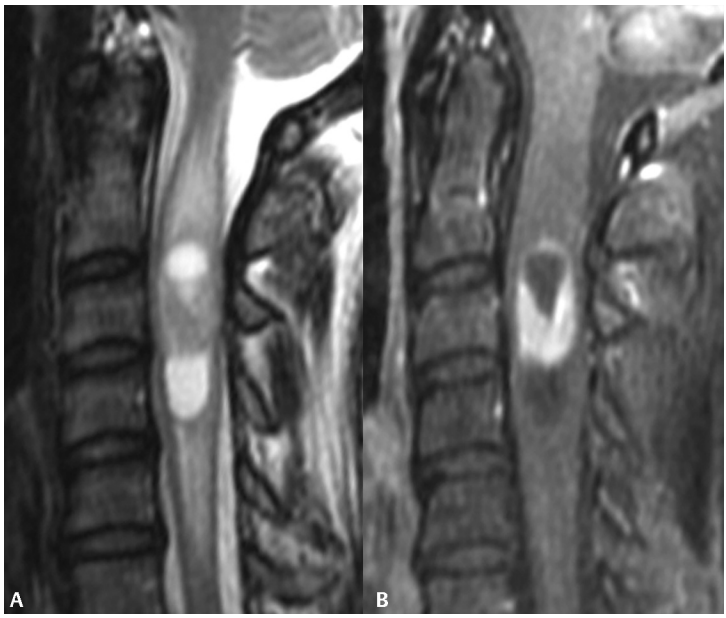

Fig. 36.1 (A,B)

occur and tend to be more aggressive. Meningiomas are typically solitary, although multiple lesions are associated with NF2. A typical appearance of a cervical cord meningioma is illustrated in the axial T2WI and contrast-enhanced T1WI of **Figs. 36.3A,B**, respectively. On the former, this well-delineated lesion clearly is arising within the dural space but outside of the spinal cord, somewhat compressing the latter posterolaterally and demonstrating slight hyperintensity to the cord on T2WI. Note also the broad dural base. The location of this tumor may be further elucidated on sagittal imaging where intramedullary extradural tumors demonstrate relative broadening of the subarachnoid space at its margin with the tumor as well as clear delineation of tumor from cord. As seen here, meningiomas characteristically enhance avidly and homogeneously postcontrast. Calcification is frequent, although not regularly

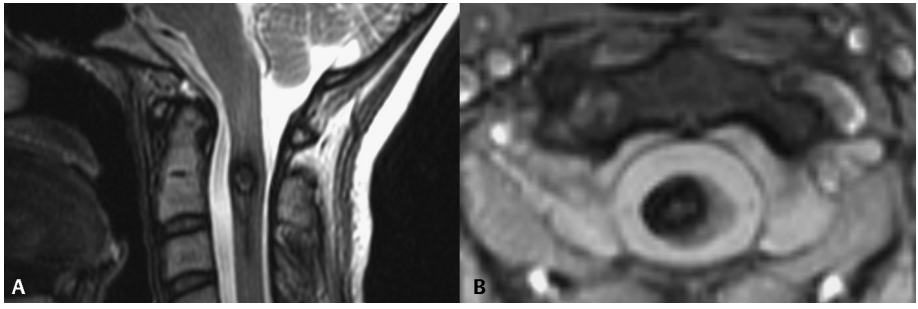

Fig. 36.2 (A,B)

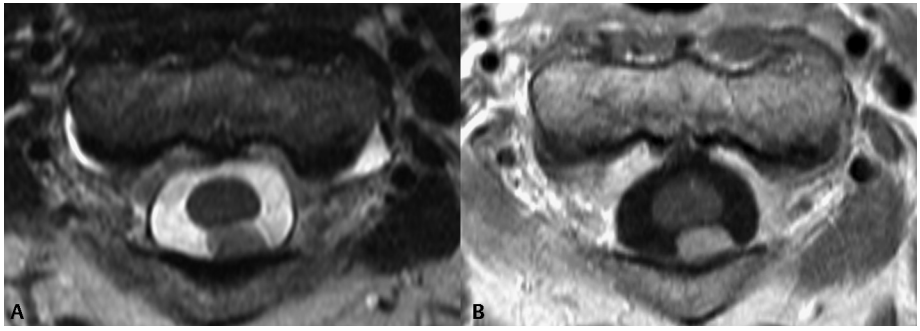

Fig. 36.3 (A,B)

appreciated on MRI, unless extremely dense (and then seen as a signal void). Points of distinction between spinal meningiomas and nerve sheath tumors as well as further differential considerations are covered in Chapters 39 and 51. Nerve sheath tumors are more frequently multiple in number, lack an enhancing dural tail, and may demonstrate foci of hypercellularity (Antoni A areas) correlating with low SI on T2WI in distinction to the normally homogeneous appearance of meningiomas.