

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, occurring as well (although less frequently) in the thoracic spine.

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 margins of the latter are less distinct and CSF-pulsation artifacts absent. CE MR further aids in the distinction and should also be utilized in the initial workup of any syrinx without obvious cause (i.e. Chiari malformations). Post-operatively, contrast administration is useful in differentiating non-enhancing post-operative 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.

The most important differential diagnosis for a cervical astrocytoma is an ependymoma. An example (in the cervical spine) of the more common cellular subtype is illustrated in the T2 and CE T1WI of Figure 36.1 A, B, respectively. As shown here, ependymomas, unlike astrocytomas, are often heterogenous on (A) T2WI, with associated cysts common. In this particular case, there is a (B) non-enhancing 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. Dilatation of the central canal can also occur, likely related to partial obstruction. In the example presented, the cord is expanded (which is characteristic), somewhat more focally than would be expected with an astrocytoma (spanning only C3-4). 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. As noted previously, involvement is also typically of a shorter segment of the cord than with an astrocytoma. Contrast enhancement can be intense and well-delineated, or more heterogeneous.

A differential diagnosis to keep in mind, for an intramedullary neoplasm, is a cavernous

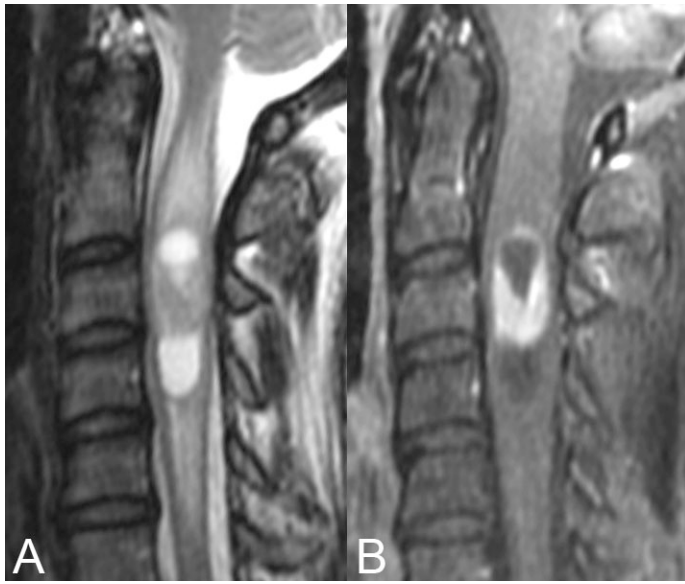


Fig. 36.1

malformation (angioma). These vascular lesions are typically small and focal, with figure 36.2 A, B demonstrating the characteristic 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 (although a low-grade neoplasm) that can be seen in the cervical and thoracic cord, although they are more common in the posterior fossa. Hemangioblastomas are discussed in greater detail in Chapter 51.

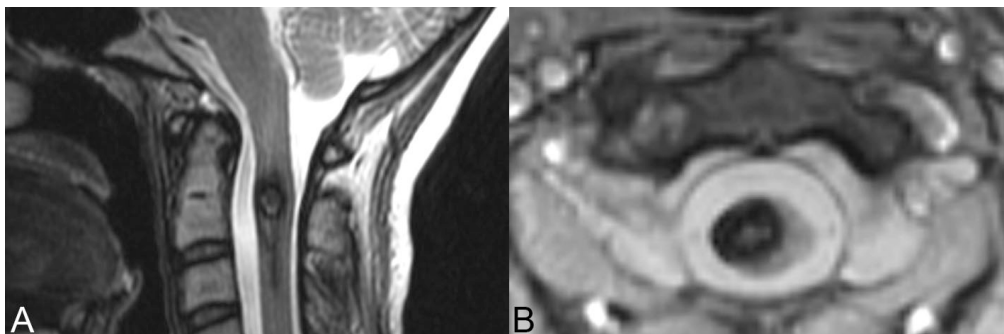


Fig. 36.2

Of intradural extramedullary lesions involving the cervical region, nerve sheath tumors and meningiomas (see also Chapters 39 and 51) are the most common. Like intracranial

meningiomas, those of the spine tend to be found in adults. Purely extradural meningiomas do occur, but are rare, and tend to be more aggressive. Meningiomas are typically solitary, although multiple lesions are associated with type 2 neurofibromatosis. A typical appearance of a cervical cord meningioma is illustrated in the axial T2 and CE T1WI of Figure 36.3 A, B, respectively. On the former, this well-delineated lesion is clearly intradural but extramedullary, mildly compressing the cord posterolaterally and demonstrating slight hyperintensity to the cord on T2WI. Note also the broad dural base. As viewed on sagittal images (not shown), intramedullary extradural lesions show deviation of the spinal cord away from the lesion and ipsilateral subarachnoid space enlargement, classically a cap (meniscus) of CSF above and below the lesion. As seen in the example presented, meningiomas characteristically enhance avidly and homogeneously post-contrast. Calcification is frequent, although not regularly appreciated on MRI, unless extremely dense (and then seen as a signal void). Points of distinction between spinal meningiomas and nerve sheath tumors (schwannomas and neurofibromas) as well as further differential considerations are covered in Chapters 39 and 51.

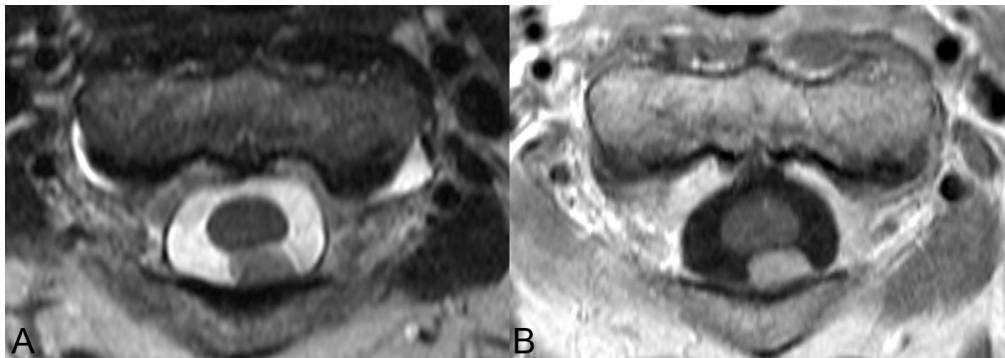


Fig. 36.3