

24. Arachnoid Cysts

Arachnoid cysts are the most common “congenital” cystic brain abnormality, with most present at birth. They can however occur as the sequela of trauma, although this is much less common. Arachnoid cysts typically lie between the layers of the arachnoid. Along with berry aneurysms, they represent a frequent intracranial finding in polycystic kidney disease. Arachnoid cysts most commonly originate in the middle cranial fossa (Fig. 24.1 A, B). Although typically much smaller than the lesion in Figure 24.1 A, B, arachnoid cysts are CSF-filled and thus characterized by isointensity to CSF on all MR pulse sequences. This appearance includes high SI on T2WI (Fig. 24.1 A), low SI on T1WI (Fig. 24.1 B), and importantly low SI on FLAIR scans and DWI. Other characteristic locations include along the brain convexities, within the quadrigeminal plate cistern, and retrocerebellar. While typically asymptomatic, arachnoid cysts may become large enough to cause substantial mass effect on adjacent structures (yet still be asymptomatic). Figure 24.1 C demonstrates a large arachnoid cyst displacing the adjacent frontal lobe and also remodelling the inner table of the left frontal bone. Such erosions of the calvaria tend to be smooth.

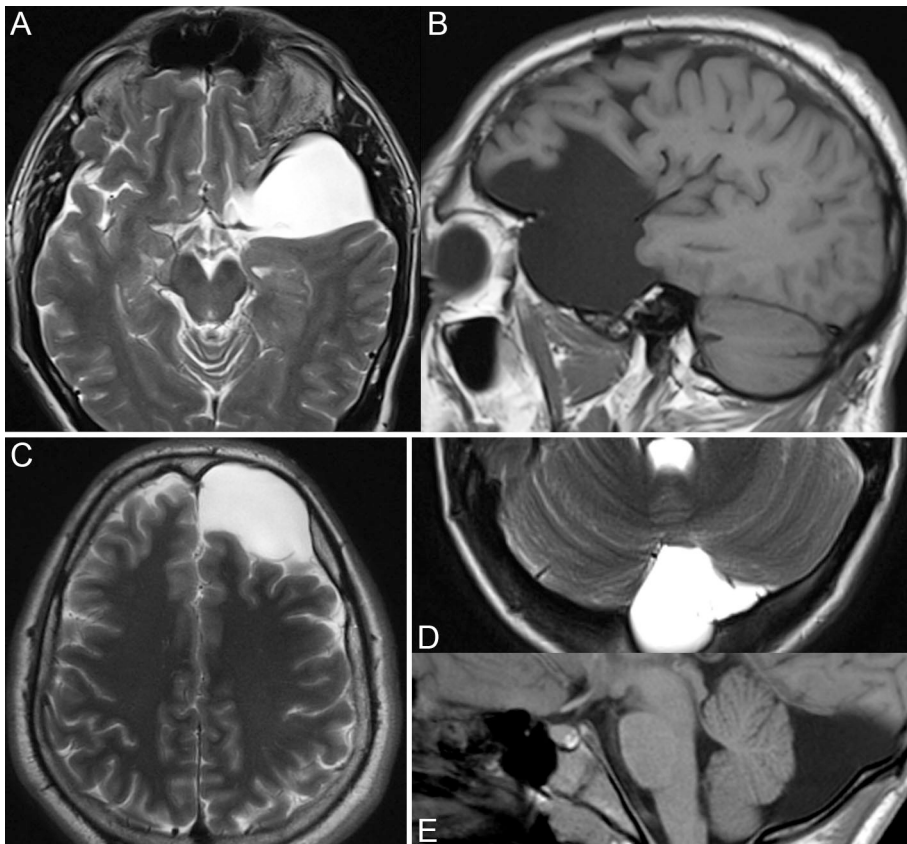


Fig. 24.1

A retrocerebellar arachnoid cyst (Fig. 24.1 D, E) must be differentiated from the characteristic cyst of a Dandy-Walker malformation. Both entities may result in mass effect (note the displacement of the left cerebellar hemisphere in Fig. 24.1 D) and elevation of the cerebellar tentorium (seen to some degree in Figure 24.1 E). However, whereas the fourth ventricle communicates with the retrocerebellar cyst in a Dandy-Walker malformation and thus appears enlarged, an arachnoid cyst tends to compress the ventricle (Fig. 24.1 E). While the cerebellar vermis is often compressed (as seen partially in Fig. 24.1 E), an otherwise intact vermis is diagnostic of an arachnoid cyst. Both an arachnoid cyst and the cyst in a Dandy-Walker malformation may be confused with a prominent cisterna magna (or cerebellomedullary cistern). This is a common benign, typically congenital, condition known as mega cisterna magna. Unlike the other entities above, a mega cisterna magna characteristically does not exert mass effect.

Additional differential considerations for an arachnoid cyst include a subdural hygroma, an epidermoid cyst, a widened subarachnoid space from brain atrophy, and a choroid fissure cyst. Subdural hygromas (see Chapter 9) result from a CSF leak through the meninges or resorption of blood products in a chronic subdural hematoma. Due to their location, these lesions are crescentic-shaped—an appearance not seen with arachnoid cysts. Subdural hygromas also do not erode bone, unlike arachnoid cysts and epidermoids. Epidermoids (see Chapter 5) are further distinguished from arachnoid cysts by a higher SI on T1WI, FLAIR, and PDWI along with restricted diffusion. Epidermoids also, in contrast to arachnoid cysts and hygromas, encase rather than compress vasculature and infiltrate rather than flatten the cortical sulci. A widened subarachnoid space secondary to atrophy will always appear isointense to CSF and will never demonstrate mass effect or erode bone. A choroid fissure cyst is a typically benign, incidental collection of CSF thought to be congenital in etiology, arising in or near the choroid fissure. The choroid fissure is a CSF-filled space that runs between structures of the diencephalon and the hippocampus—an area commonly evaluated for the presence of seizure foci. Choroid fissure cysts, however, are almost always incidental findings, rarely producing seizures or mass effect within the temporal lobe. On sagittal MRI, these cysts are spindle-shaped and isointense to CSF on all sequences.

Additional typically benign entities warranting consideration include colloid cysts and intracranial lipomas. The most characteristic feature of colloid cysts is their location within the anterior portion of the third ventricle, where they can obstruct the foramina of Monro and thus result in enlargement of the lateral ventricles. The spectrum of possible content—cholesterol, blood, and cellular products along with various metal ions—leads to variable signal intensity. Colloid cysts may rarely demonstrate peripheral enhancement. Intracranial

Essentials of Clinical MR, 2nd edition

lipomas are a benign congenital lesion occurring most frequently in the cisternal space. They are commonly midline, 80% being supratentorial, with the most common location being just superior (and along) the corpus callosum. The appearance of these lesions on MRI—increased SI on T1WI—reflects their fat composition. Chemical shift artifacts may be seen as a band of high or low SI at the margin between fat and adjacent fluid or brain.