

CHAPTER A2

Cerebral Venous Lesions

INTRODUCTION

Cerebral venous imaging includes evaluation of intracerebral venous thrombosis as well as imaging cavernous and venous angiomas. This may be accomplished by conventional MR imaging and magnetic resonance venography (MRV). Cerebral venous occlusive disease is distinctly different from arterial occlusive disease. With venous occlusion, the blood-brain barrier often remains intact. Signal abnormalities seen on neuroimaging studies are often reversible and hemorrhage is more common. Venous infarcts do not usually affect discrete, well defined territories like arterial infarcts. However, some patterns do tend to emerge. Transverse sinus thrombosis tends to affect the temporal lobes. Superior sagittal sinus thrombosis tends to affect the parasagittal frontal lobes. Vein of Galen/straight sinus thrombosis tends to affect the thalami.

While the cause is not always found, many of these cases fall into certain categories. Intracerebral venous thrombosis is found to have a number of predisposing factors. These can be divided into septic and aseptic causes. Aseptic causes include hematologic disorders, neoplasm, dehydration, trauma, drugs, and inflammatory conditions. Septic causes include encephalitis, meningitis, mastoiditis, sinusitis, and cellulitis.

Patients with cerebral venous thrombosis may have presentations that range from insidious onset to rapid loss of altered mental status and focal neurologic deficits. Those presenting with gradual onset of symptoms have headache, confusion, and papilledema.

Venous occlusive disease often is present with an intact blood-brain barrier. With arterial occlusive disease, the blood-brain barrier is more frequently broken down. In venous occlusive disease, initially detected abnormalities are often reversible. Hemorrhage is much more common with venous than arterial occlusion.

Cerebral venous imaging has previously been performed with invasive angiographic techniques. Many of the patients who need venous circulation evaluation do not need to have an invasive procedure, a test that involves exposure to ionizing radiation or risk reaction to iodinated contrast media. This is particularly true in the pregnant patient who is suspected of having venous sinus thrombosis. Magnetic resonance venography (MRV) offers a welcome alternative to invasive techniques. It has proven to be a valuable tool in evaluating the intracranial cerebral venous system. Imaging dural sinus thrombosis is the topic of *UNIT A2.1*.

Often MRI is used to clarify a confusing finding identified on another imaging study. Frequently, these lesions are first seen on MRI examinations and may be completely worked up or followed with MRI. This is related to the frequency with which patients are being examined by MR for unexplained headaches. Cavernomas may be followed sequentially with MRI, particularly after a bleed. Most venous angiomas are small and self-limiting, and no further examination is necessary. The sequences described in *UNITS A2.1, A2.2, and A2.3* are based on experience with the Siemens 1.5 T Vision and Sonata scanners, but should be adaptable to high-field-strength machines from other manufacturers. Cavernous angiomas and venous angiomas may be completely worked up with MRI without need for additional diagnostic studies. Imaging of cavernous angiomas and cavernomas are the topics of *UNITS A2.2 and A2.3* respectively.

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