



## By Location

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This chapter is composed of a series of tables, which contain a differential list for a given intracranial location. The abbreviations used within these tables are listed at the end of this chapter. This is a reference for building a quick differential diagnosis during patient Rounds.

### Table 1: Posterior Cranial Fossa

Differential list for posterior cranial fossa lesions

|                   |   |
|-------------------|---|
| <b>Neoplastic</b> | <ul style="list-style-type: none"><li>● <a href="#">Metastatic</a> (solitary or numerous)</li><li>● <a href="#">Hemangioblastoma</a> (solitary or numerous, cystic nodule)</li><li>● <a href="#">Pilocytic astrocytoma</a> (cystic irregularly enhancing nodule)</li><li>● Brainstem glioma</li><li>● <a href="#">Medulloblastoma</a></li><li>● Ependymoma</li><li>● Cerebellar liponeurocytoma</li><li>● Choroid plexus tumor</li><li>● <a href="#">Dysplastic gangliocytoma</a> (enlargement of folia on MRI)</li></ul> |
| <b>Vascular</b>   | <ul style="list-style-type: none"><li>● Infarction</li><li>● Intracerebellar hemorrhage (hypertensive, neoplastic)</li><li>● Cavernous malformation (solitary or multiple)</li><li>● Aneurysm</li><li>● AVM</li></ul>   |
| <b>Infectious</b> | <ul style="list-style-type: none"><li>● Abscess (solitary or multiple)</li></ul>  |
| <b>Cystic</b>     | <ul style="list-style-type: none"><li>● Dandy-Walker malformation</li><li>● <a href="#">Epidermoid cyst</a></li><li>● Neurenteric cyst</li><li>● <a href="#">Arachnoid cyst</a></li><li>● Cerebellar <a href="#">hemangioblastoma</a></li></ul>   |

|             |  |
|-------------|--|
|             | <ul style="list-style-type: none"> <li>● <a href="#">Pilocytic astrocytoma</a></li> <li>● Mega cisterna magna</li> </ul> |
| CPA Lesions | <ul style="list-style-type: none"> <li>● See expanded section below for CPA differential list</li> </ul>                 |

**Table 2: Cerebellopontine Angle**  
Differential list for cerebellopontine angle lesions

|            |  |
|------------|--|
| Neoplastic | <ul style="list-style-type: none"> <li>● <a href="#">Vestibular schwannoma</a> (acoustic neuroma, ~75% of CPA lesions)</li> <li>● Meningiomas (~6% of CPA lesions)</li> <li>● <a href="#">Epidermoid cyst</a> (hyperintense on DWI, can be confused with arachnoid cyst)</li> <li>● Metastasis (breast or lung origin)</li> <li>● Schwannomas of Cranial Nerves V, VII, IX, VII, IX, X, XI, XII (~4% of CPA lesions, V &gt; VII &gt; IX, X, XI, XII)</li> <li>● Arachnoid cyst (0.5-2% of CPA lesions, isodense to CSF on DWI; loculated)</li> <li>● <a href="#">Dermoid cyst</a> (~0.5% of CPA lesions)</li> <li>● Neurenteric cyst</li> <li>● <a href="#">Lipoma</a></li> <li>● Neoplastic extension into CPA: <ul style="list-style-type: none"> <li>○ Petrous bone tumors</li> <li>○ Cerebellar tumors</li> <li>○ Pituitary adenomas</li> <li>○ <a href="#">Craniopharyngiomas</a></li> <li>○ Paraganglioma</li> <li>○ Chordoma</li> <li>○ <a href="#">Choroid plexus papilloma</a></li> </ul> </li> </ul> |
| Vascular   | <ul style="list-style-type: none"> <li>● Aneurysm <ul style="list-style-type: none"> <li>○ Vertebrobasilar</li> <li>○ PICA</li> <li>○ AICA</li> </ul> </li> <li>● AVM</li> <li>● Vertebrobasilar dolichoectasia</li> </ul>   |
| Infectious | <ul style="list-style-type: none"> <li>● Neurocysticercosis (<i>Taenia solium</i>, rice-grain calcifications)</li> </ul>   |

|               |  |
|---------------|--|
| Miscellaneous | <ul style="list-style-type: none"> <li>Cholesterol granuloma (granulation tissue in pneumatized bone)</li> </ul> |
|---------------|--|

### Table 3: Medial Temporal Lobe

Differential list for medial temporal lobe lesions

|               |   |
|---------------|---|
| Neoplastic    | <ul style="list-style-type: none"> <li>Glioma (more commonly low grade)</li> <li><a href="#">Ganglioglioma</a></li> <li>PNET</li> </ul>               |
| Vascular      | <ul style="list-style-type: none"> <li>Temporal lobe infarction</li> <li>Cavernous malformation</li> <li>AVM</li> </ul>                               |
| Infectious    | <ul style="list-style-type: none"> <li>HSV encephalitis (FLAIR abnormalities affecting limbic system)</li> </ul>                                      |
| Inflammatory  | <ul style="list-style-type: none"> <li>Limbic encephalitis (either paraneoplastic or nonparaneoplastic)</li> <li>Mesial temporal sclerosis</li> </ul> |
| Miscellaneous | <ul style="list-style-type: none"> <li><a href="#">Cortical dysplasia</a></li> </ul>  |

### Table 4: Foramen Magnum

Differential list for foramen magnum lesions

|            |  |
|------------|--|
| Neoplastic | <ul style="list-style-type: none"> <li>Meningioma (compose the majority of primary lesions)</li> <li>Schwannoma (lower cranial nerves)</li> <li><a href="#">Metastatic tumors</a></li> <li>Neurofibroma</li> <li>Chordoma</li> <li>Paraganglioglioma</li> <li><a href="#">Epidermoid</a></li> <li>Chondrosarcoma</li> <li>Brainstem glioma</li> <li><a href="#">Ganglioglioma</a></li> </ul> |
|------------|--|

|                      |  |
|----------------------|--|
|                      | <ul style="list-style-type: none"> <li>• <a href="#">Anaplastic astrocytoma</a></li> <li>• Ependymoma</li> <li>• Cavernous malformation</li> </ul>   |
| <b>Vascular</b>      | <ul style="list-style-type: none"> <li>• Vertebral artery aneurysm</li> <li>• Vertebral dolichoectasia</li> </ul>  |
| <b>Infectious</b>    | <ul style="list-style-type: none"> <li>• Craniocervical tuberculosis</li> </ul>  |
| <b>Miscellaneous</b> | <ul style="list-style-type: none"> <li>• Quadrate ligament synovial cysts</li> <li>• Craniometaphyseal dysplasia</li> <li>• Odontoid process synovial articulation pannus in rheumatoid arthritis</li> </ul> |

## Table 5: White Matter Tract Disease (Leukoencephalopathy)

Differential list for white matter disease

Pearl: High intensity T2WI, low intensity T1WI is characteristic for demyelination

|                     |   |
|---------------------|---|
| <b>Inflammatory</b> | <ul style="list-style-type: none"> <li>• <a href="#">Acute disseminated encephalomyelitis</a></li> <li>• Multiple sclerosis</li> <li>• Neuromyelitis optica</li> <li>• Acute hemorrhagic leukoencephalitis</li> <li>• Tumefactive demyelinating lesions (monofocal acute inflammatory demyelination)</li> </ul>   |
| <b>Infectious</b>   | <ul style="list-style-type: none"> <li>• HIV infection (and associated CNS pathology)</li> <li>• Progressive multifocal leukoencephalopathy</li> <li>• Human herpes leukoencephalitis: <ul style="list-style-type: none"> <li>◦ HSV-1/2</li> <li>◦ CMV</li> <li>◦ Varicella-zoster</li> </ul> </li> <li>• Subacute sclerosing panencephalitis</li> <li>• Creutzfeldt-Jakob disease</li> </ul> |
| <b>Neoplastic</b>   | <ul style="list-style-type: none"> <li>• Glioma (low-grade)</li> <li>• Multiple myeloma</li> </ul>  |

|                      |   |
|----------------------|---|
| <b>Metabolic</b>     | <ul style="list-style-type: none"> <li>● Osmotic myelinolysis</li> <li>● Subacute combined degeneration: <ul style="list-style-type: none"> <li>○ Vitamin B12 deficiency</li> <li>○ Vitamin E deficiency</li> <li>○ Copper deficiency</li> </ul> </li> <li>● Toxic leukoencephalopathy: <ul style="list-style-type: none"> <li>○ Cyanide</li> <li>○ Carbon monoxide</li> <li>○ Arsenic, solvents</li> <li>○ Select immunosuppressants</li> <li>○ Anti-neoplastic agents</li> <li>○ Substances of abuse</li> </ul> </li> </ul> |
| <b>Vascular</b>      | <ul style="list-style-type: none"> <li>● Chronic hypertensive encephalopathy</li> <li>● Small vessel ischemia</li> <li>● Anoxia</li> </ul>  |
| <b>Congenital</b>    | <ul style="list-style-type: none"> <li>● Metachromatic leukodystrophy (lysosomal storage disease)</li> <li>● Adrenoleukodystrophy (disorder of peroxisomal oxidation)</li> <li>● Krabbe disease (sphingolipidosis)</li> <li>● Canavan disease (enzyme deficiency causing defect in myelin synthesis)</li> </ul>   |
| <b>Miscellaneous</b> | <ul style="list-style-type: none"> <li>● Leukoaraiosis or “small vessel disease”</li> </ul>   |

## Table 6: Corpus Callosum

Differential list for corpus callosum lesions

|                   |   |
|-------------------|---|
| <b>Neoplastic</b> | <ul style="list-style-type: none"> <li>● CNS lymphoma</li> <li>● <a href="#">Glioblastoma multiforme</a> (crossing corpus callosum)</li> <li>● <a href="#">Gliomatosis cerebri</a></li> <li>● <a href="#">Lipoma</a></li> </ul> |
| <b>Vascular</b>   | <ul style="list-style-type: none"> <li>● Infarction</li> <li>● Hemorrhage</li> <li>● Delayed post-hypoxic leukoencephalopathy</li> </ul>  |
|                   |   |

|                      |  |
|----------------------|--|
| <b>Infectious</b>    | <ul style="list-style-type: none"> <li>Progressive multifocal leukoencephalopathy (in 10-15%)</li> </ul>   |
| <b>Inflammatory</b>  | <ul style="list-style-type: none"> <li>Multiple sclerosis</li> <li><a href="#">Acute disseminated encephalomyelitis</a></li> <li>Neuromyelitis optica</li> <li>Tumefactive demyelinating lesions</li> <li>Neurosarcoidosis</li> <li>Lupus erythematosus</li> <li>Sjogren syndrome</li> </ul> |
| <b>Metabolic</b>     | <ul style="list-style-type: none"> <li>Wernicke encephalopathy</li> <li>Osmotic myelinolysis</li> </ul>  |
| <b>Miscellaneous</b> | <ul style="list-style-type: none"> <li>Diffuse axonal injury (post-traumatic)</li> <li>Toxic leukoencephalopathy</li> <li>Chronic hydrocephalus</li> <li>Leukodystrophy (with diffuse white matter change)</li> </ul>  |

## Table 7: Sellar, Suprasellar, or Parasellar Lesions

Differential list for sellar, suprasellar and parasellar lesions

|                   |  |
|-------------------|--|
| <b>Neoplastic</b> | <ul style="list-style-type: none"> <li>Pituitary adenoma (most common in adults; can have extrasellar invasion) <ul style="list-style-type: none"> <li><a href="#">Microadenoma</a> (&lt;1cm)</li> <li><a href="#">Macroadenoma</a> (&gt;1cm)</li> <li>Invasive adenoma</li> <li>Pituitary carcinoma</li> </ul> </li> <li>Meningioma (unlikely to cause expansion of sellar floor, demonstrates a dural tail, homogenous enhancement, differentiate from <a href="#">macroadenoma</a>)</li> <li><a href="#">Craniopharyngioma</a> (frequent in children)</li> <li>Astrocytoma (hypothalamic, neurohypophyseal, chiasmatic)</li> <li>Germ cell tumors (triad of DI, visual field deficit, panhypopituitarism with synchronous pineal region mass) <ul style="list-style-type: none"> <li><a href="#">Germinoma</a></li> <li><a href="#">Teratoma</a></li> <li>Embryonal cell carcinoma</li> <li>Choriocarcinoma</li> <li>Endodermal sinus tumors</li> </ul> </li> </ul> |
|-------------------|--|

|                           |   |
|---------------------------|---|
|                           | <ul style="list-style-type: none"> <li>○ Mixed germ cell tumors</li> <li>● Chordoma</li> <li>● Arachnoid cyst</li> <li>● <a href="#">Dermoid cyst</a></li> <li>● <a href="#">Epidermoid cyst</a></li> <li>● Optic nerve glioma</li> <li>● CNS lymphoma (<a href="#">primary</a> or <a href="#">metastatic</a>)</li> <li>● Pituitary/sellar metastasis (most common tumor in neurohypophysis, from lung or breast)</li> <li>● Pituitary (primary neoplasm of neurohypophysis)</li> <li>● <a href="#">Pilocytic astrocytoma</a> (involves neurohypophysis, termed infundibuloma)</li> <li>● Granular cell tumors (rare tumor of neurohypophysis)</li> </ul> |
| <b>Vascular</b>           | <ul style="list-style-type: none"> <li>● Aneurysm (ICA, ACoA, ophthalmic, basilar)</li> </ul>   |
| <b>Infectious</b>         | <ul style="list-style-type: none"> <li>● Parasitic infection (neurocysticercosis)</li> </ul>  |
| <b>Inflammatory</b>       | <ul style="list-style-type: none"> <li>● Hypophysitis (thickening of the pituitary stalk-DI is classic feature)</li> <li>● Autoimmune hypophysitis</li> <li>● Pituitary granuloma</li> <li>● Neurosarcoidosis (hypothalamic involvement, panhypopituitarism)</li> </ul>   |
| <b>Cystic</b>             | <ul style="list-style-type: none"> <li>● Rathke cleft cyst (differentiate from cystic <a href="#">craniopharyngioma</a>)</li> <li>● Cystic <a href="#">craniopharyngioma</a> (85% of all have cysts)</li> <li>● <a href="#">Dermoid cyst</a></li> <li>● <a href="#">Epidermoid cyst</a></li> </ul>  |
| <b>Sphenoid Anomalies</b> | <ul style="list-style-type: none"> <li>● Chondromyxoid fibroma</li> <li>● Giant cell tumor</li> <li>● Bone spur</li> <li>● Extramedullary hematopoiesis</li> </ul>  |
| <b>Miscellaneous</b>      | <ul style="list-style-type: none"> <li>● Empty sella syndrome (Pseudotumor cerebri, secondary hydrocephalus)</li> <li>● <b>Pituitary pseudotumor (pituitary hyperplasia caused by</b></li> </ul>  |

hypothyroidism, pregnancy, primary hypogonadism, intracranial hypotension)

## Table 8: Pineal Region

### Differential diagnosis for pineal region masses

|            |  |
|------------|--|
| Neoplastic | <ul style="list-style-type: none"><li>● Germ cell tumors:<ul style="list-style-type: none"><li>○ <a href="#">Germinoma</a></li><li>○ Embryonal carcinoma</li><li>○ Choriocarcinoma</li><li>○ <a href="#">Teratoma</a></li><li>○ Yolk sac tumor</li></ul></li><li>● PNET</li><li>● Pineal parenchymal tumors<ul style="list-style-type: none"><li>○ <a href="#">Pineocytoma</a></li><li>○ <a href="#">Pineoblastoma</a></li><li>○ Papillary tumor</li></ul></li><li>● Pineal cyst</li><li>● Arachnoid cyst</li><li>● Astrocyoma</li><li>● Meningioma</li><li>● Metastasis</li><li>● CNS lymphoma</li><li>● <a href="#">Lipoma</a></li></ul> |
| Vascular   | <ul style="list-style-type: none"><li>● Aneurysm</li><li>● Cavernous malformation</li></ul>  |

## Table 9: Cavernous Sinus

### Differential list for cavernous sinus lesions

|            |  |
|------------|--|
| Neoplastic | <ul style="list-style-type: none"><li>● Meningioma</li><li>● Schwannoma (CN V or CN III)</li><li>● Pituitary adenoma</li><li>● Metastasis</li><li>● Chondrosarcoma (origin at petroclival synchondrosis)</li><li>● Chondroma</li><li>● Chordoma (derived from notochordal remnant)</li></ul> |
|------------|--|



|                     |   |
|---------------------|---|
|                     | <ul style="list-style-type: none"> <li>• Nasopharyngeal carcinoma</li> <li>• Esthesioneuroblastoma</li> <li>• <a href="#">Epidermoid cyst</a></li> <li>• <a href="#">Dermoid cyst</a></li> <li>• Angiofibroma</li> <li>• Hemangioma</li> <li>• Leukemia/lymphoma (by extension from nasopharyngeal origin)</li> </ul> |
| <b>Vascular</b>     | <ul style="list-style-type: none"> <li>• Carotid-cavernous fistula</li> <li>• Aneurysm (intravascular ICA)</li> <li>• Hemangioma</li> </ul>   |
| <b>Infectious</b>   | <ul style="list-style-type: none"> <li>• Cavernous sinus thrombosis (commonly related to spreading infection from nasopharynx or mastoid, ie mucormycosis in diabetic patients)</li> </ul>  |
| <b>Inflammatory</b> | <ul style="list-style-type: none"> <li>• Tolosa Hunt syndrome (present with headaches and extra ocular movement palsy)</li> </ul>   |

## Table 10: Intraventricular

Differential list for intraventricular lesions. The neoplasm section does not including intraparenchymal lesions that invaginate the ventricle

|                   |  |
|-------------------|--|
| <b>Neoplastic</b> | <ul style="list-style-type: none"> <li>• Astrocytoma (frontal horn, 3rd ventricle, trigone, 4th ventricle)</li> <li>• <a href="#">Colloid cyst</a> (third ventricle)</li> <li>• Ependymoma (fourth ventricle)</li> <li>• <a href="#">Subependymoma</a> (fourth and lateral ventricles, minimal enhancement)</li> <li>• <a href="#">Central neurocytoma</a> (lateral ventricle)</li> <li>• <a href="#">Craniopharyngioma</a> (third ventricle, punctate calcification)</li> <li>• Meningioma (trigone)</li> <li>• Metastasis (renal and lung origins)</li> <li>• <a href="#">Epidermoid cyst</a> (third ventricle)</li> <li>• Ependymal cyst (lateral ventricle)</li> <li>• Arachnoid cyst (lateral ventricle)</li> </ul> |
|-------------------|--|

|                      |   |
|----------------------|---|
|                      | <ul style="list-style-type: none"> <li>● <a href="#">Dermoid cyst</a> (fourth ventricle, free floating fat indicates rupture)</li> <li>● PNET (<a href="#">medulloblastoma</a>, fourth ventricle)</li> <li>● Germ Cell Tumors: <ul style="list-style-type: none"> <li>○ <a href="#">Teratoma</a> (lateral ventricle)</li> <li>○ <a href="#">Germinoma</a> (pineal region)</li> <li>○ Pinealoma (posterior third ventricle)</li> </ul> </li> <li>● Solitary fibrous tumor</li> <li>● <a href="#">Choroid plexus papilloma</a> (lateral ventricle)</li> <li>● CNS lymphoma (<a href="#">primary</a>)</li> <li>● Choroidal glioma</li> </ul> |
| <b>Vascular</b>      | <ul style="list-style-type: none"> <li>● AVM</li> <li>● Sturge-Weber syndrome</li> <li>● Vein of Galen aneurysm</li> <li>● Cavernous malformations (3rd ventricle)</li> <li>● Intraventricular hemorrhage (Most commonly from extension of intraparenchymal hemorrhage in adults and subependymal hemorrhage in neonates)</li> </ul>  |
| <b>Infectious</b>    | <ul style="list-style-type: none"> <li>● Neurocysticercosis (<i>Taenia solium</i>; any ventricular location; often multiple)</li> <li>● <i>Cryptococcus neoformans</i> (cryptococcoma)</li> <li>● Tuberculosis</li> <li>● Cytomegalovirus</li> <li>● Varicella zoster virus</li> <li>● Toxoplasmosis</li> <li>● Ependymal dissemination</li> </ul>  |
| <b>Inflammatory</b>  | <ul style="list-style-type: none"> <li>● Histiocytosis</li> <li>● Neurosarcoidosis (anterior 3rd ventricle)</li> </ul>  |
| <b>Miscellaneous</b> | <ul style="list-style-type: none"> <li>● Tuber cinereum hamartoma (hypothalamic hamartoma)</li> </ul>   |

**Table 11: Periventricular**  
Differential list for periventricular lesions

|                   |  |
|-------------------|--|
| <b>Neoplastic</b> | <ul style="list-style-type: none"> <li>● CNS lymphoma</li> </ul> |
|-------------------|--|

|                      |  |
|----------------------|--|
|                      | <ul style="list-style-type: none"> <li>• Ependymoma (invaginate)</li> <li>• <a href="#">Glioblastoma multiforme</a></li> <li>• Metastasis (melanoma, choriocarcinoma)</li> <li>• <a href="#">Medulloblastoma</a> (children)</li> <li>• Pineal gland dysgerminoma (children)</li> </ul> |
| <b>Vascular</b>      | <ul style="list-style-type: none"> <li>• Cerebral infarction</li> <li>• Vasculitis</li> <li>• Small vessel vascular dementia (Binswanger's disease)</li> <li>• Amyloid angiopathy</li> <li>• Periventricular leukomalacia (hypoxic-ischemic lesions)</li> </ul>                        |
| <b>Infectious</b>    | <ul style="list-style-type: none"> <li>• Ventriculitis (pyogenic, viral meningitis, or intracerebral abscess)</li> <li>• Cytomegalovirus (congenital, periventricular calcifications)</li> </ul>   |
| <b>Inflammatory</b>  | <ul style="list-style-type: none"> <li>• Multiple sclerosis (Dawson's fingers and "jagged-bordered" hyperintensities)</li> <li>• Neuromyelitis optica</li> </ul>   |
| <b>Miscellaneous</b> | <ul style="list-style-type: none"> <li>• Post-traumatic ventriculitis</li> <li>• Adrenoleukodystrophy</li> <li>• Leukoaraiosis</li> <li>• Heterotopias</li> </ul>  |

## Table 12: Meningeal Enhancement

Differential list for meningeal enhancement. Pachymeningeal enhancement does not track along the parenchymal gyri. On the other hand, leptomeningeal enhancement pursues the parenchymal gyri and can be associated with nodular lesions.

### Pachymeninges

|                |   |
|----------------|---|
| <b>Focal</b>   | <ul style="list-style-type: none"> <li>• Meningioma (associated the dural tail sign)</li> <li>• <a href="#">Pleomorphic xanthoastrocytoma</a> (associated dural tail sign)</li> </ul> |
| <b>Diffuse</b> | <ul style="list-style-type: none"> <li>• Transient postoperative changes</li> </ul>   |

|                             |   |
|-----------------------------|---|
|                             | <ul style="list-style-type: none"> <li>• Primary intracranial neoplasms</li> <li>• Metastasis (either cranial, leptomeningeal, or dural)</li> <li>• CNS lymphoma</li> <li>• Granulomatous disease (neurosarcoidosis, tuberculosis)</li> <li>• Bacterial meningitis</li> <li>• Post-subdural hemorrhage</li> </ul> |
| <b>Other</b>                | <ul style="list-style-type: none"> <li>• Intracranial hypotension (most commonly caused by spontaneous spinal CSF leaks)</li> </ul>   |
| <b><u>Leptomeninges</u></b> |   |
| <b>Focal</b>                | <ul style="list-style-type: none"> <li>• Primary intracranial neoplasms</li> <li>• CNS lymphoma</li> <li>• Leptomeningeal carcinomatosis</li> </ul>   |
| <b>Diffuse</b>              | <ul style="list-style-type: none"> <li>• Postoperative period</li> <li>• Bacterial, viral, or fungal meningitis</li> <li>• Leptomeningeal carcinomatosis</li> <li>• Encephalitis</li> </ul>   |

## Table 13: Ring Enhancing Lesions on CT/MRI

Differential list for intracranial ring enhancing lesions

### Features to differentiate etiology:

- Multiplicity
- Thickness and pattern of enhancing ring (thick/irregular supports tumors)
- Homogeneity of enhancing ring (heterogeneous enhancement suggests demyelinating pathology)
- Adjacent edema, mass effect or perivascular enhancement
- T2 hypointensity along the ring
- Restriction of central diffusion (supports abscess)

|                   |   |
|-------------------|---|
| <b>Neoplastic</b> | <ul style="list-style-type: none"> <li>• Metastasis (solitary or multiple)</li> <li>• <a href="#">Glioblastoma multiforme</a></li> <li>• CNS lymphoma (thicker wall compared to abscess)</li> </ul> |
| <b>Infectious</b> | <ul style="list-style-type: none"> <li>• <a href="#">Bacterial abscess</a> (Nocardia appears multiloculated,</li> </ul>   |

|               |  |
|---------------|--|
|               | <ul style="list-style-type: none"> <li>tuberculoma or tuberculosis)</li> <li>• Parasitic abscess (neurocysticercosis, toxoplasmosis)</li> <li>• Fungal infection</li> <li>• <a href="#">Acute disseminated encephalomyelitis</a> (multiple)</li> </ul> |
| Vascular      | <ul style="list-style-type: none"> <li>• Thrombosed aneurysm</li> <li>• Subacute lacunar infarction</li> <li>• Subacute intracerebral hematoma</li> <li>• Vasculitis (multiple)</li> </ul>   |
| Miscellaneous | <ul style="list-style-type: none"> <li>• Radiation necrosis</li> <li>• Multiple sclerosis</li> <li>• Neurosarcoidosis</li> </ul>   |

### Characteristic imaging findings for ring-enhancing lesions:

- **Neoplasm:** incomplete ring and heterogeneous in appearance, unless metastatic origin, often unifocal. Lymphoma can be either metastatic or primary with a thicker enhancing wall.
- **Abscess:** demonstrates a complete, smooth and thick enhancing peripheral ring with greater central hyperintensity on DWI compared to neoplasms. It is important to consider the clinical presentation and acuity of symptom onset.
- **Subacute intracerebral hematoma:** gradient echo sequence demonstrates a continuous enhancing ring, differentiating it from an incomplete ring seen with malignancy.
- **Demyelination:** demonstrates an incomplete very thin ring of enhancement along the periventricular region with almost no mass effect considering the size of the lesion.
- **Radiation necrosis:** very thick and highly irregular enhancement pattern.

**Abbreviations:** MRI, magnetic resonance imaging; AVM, arteriovenous malformation; CPA, cerebellopontine angle; DWI, diffusion weighted

imaging; PICA, posterior inferior cerebellar artery; AICA, anterior inferior cerebellar artery; PNET, primitive neuroectodermal tumor; HSV, herpes simplex virus; FLAIR, fluid-attenuated inversion recovery; HIV, human immunodeficiency virus; CNS, central nervous system; CMV, cytomegalovirus; ICA, internal carotid artery; ACoA, anterior communicating artery; CNV, cranial nerve V; CNIII, cranial nerve III

Contributor: Benjamin K. Hendricks, MD

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