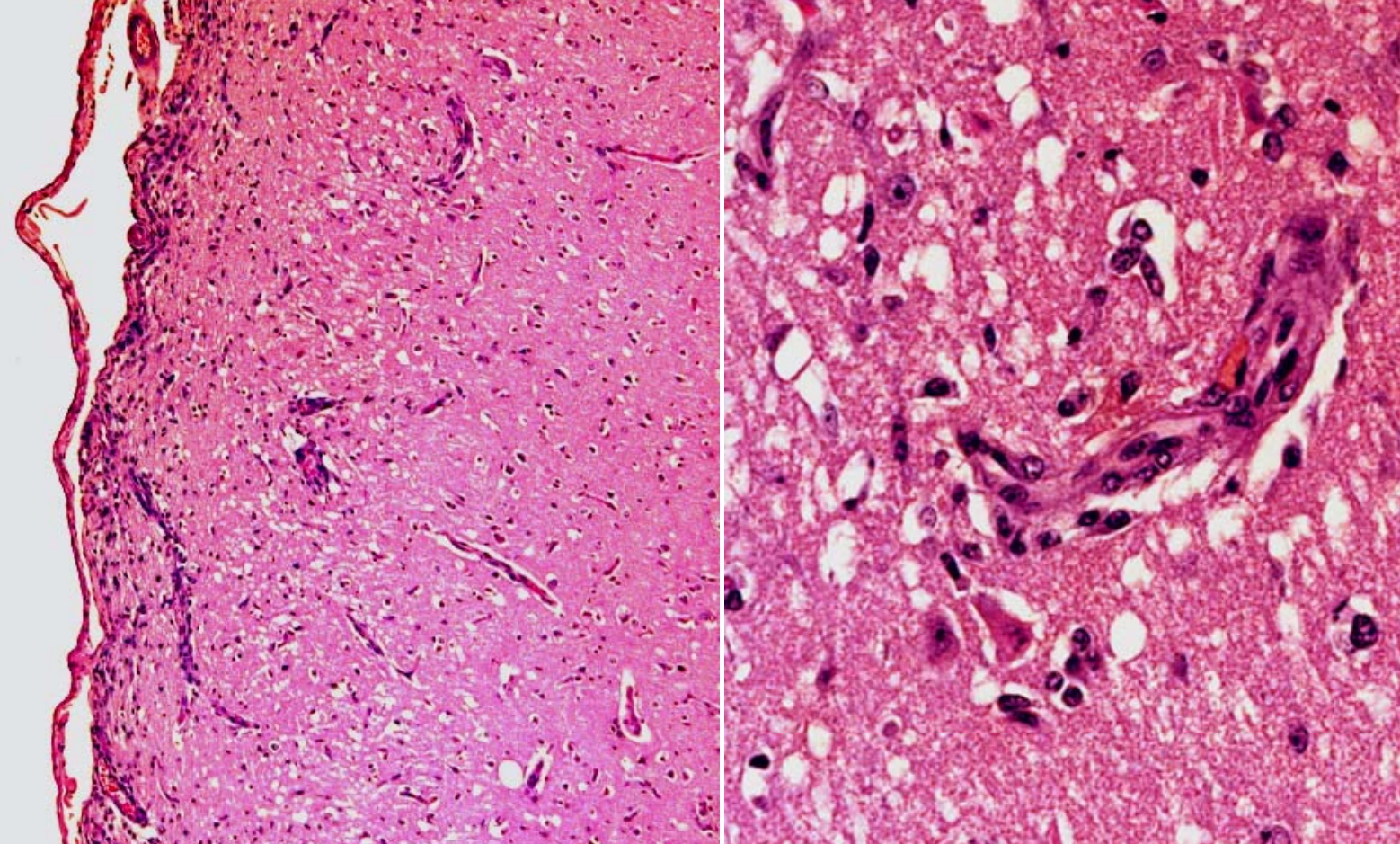


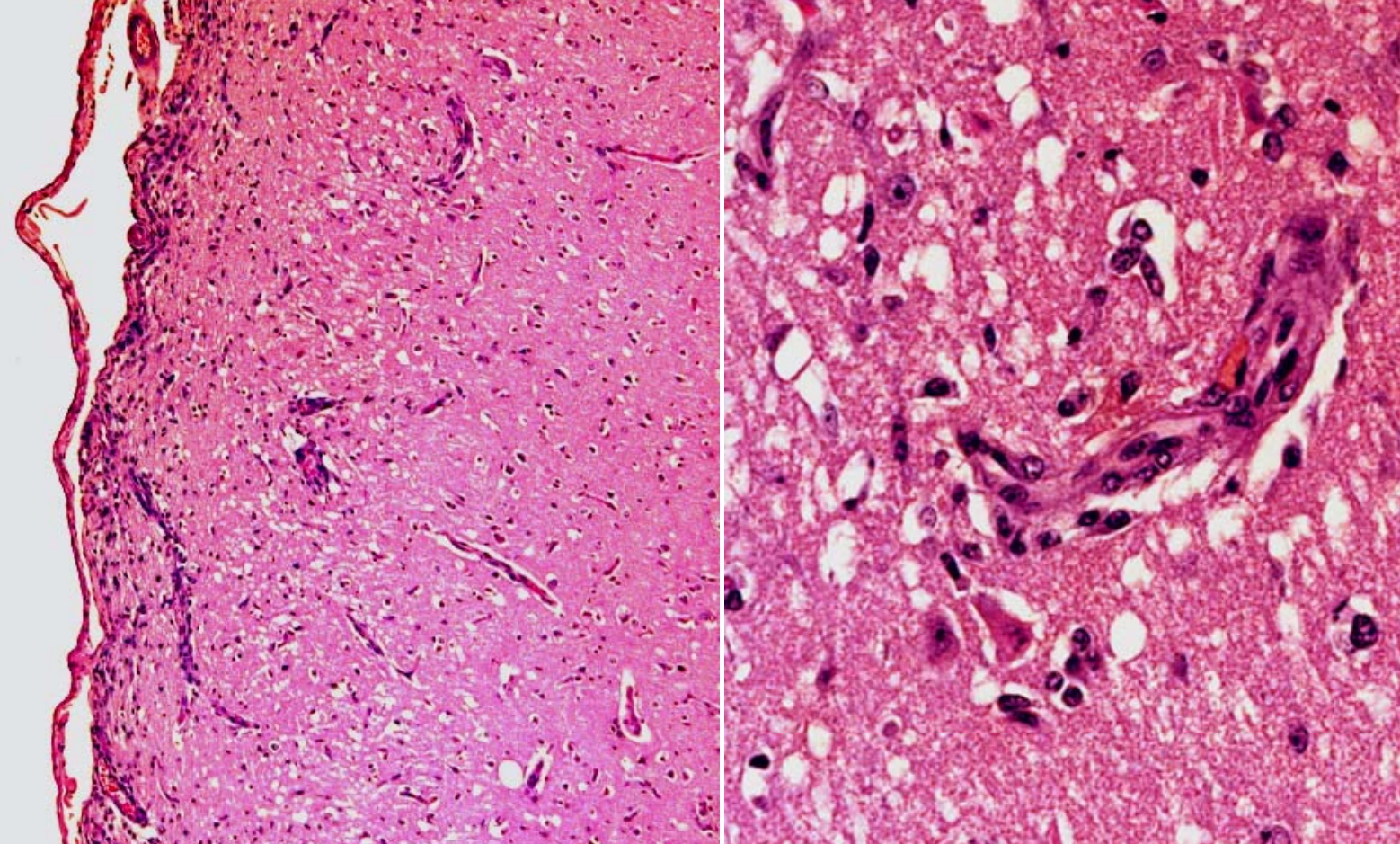


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Case 4.1 –Brain of 10/12 bovine.

Review –

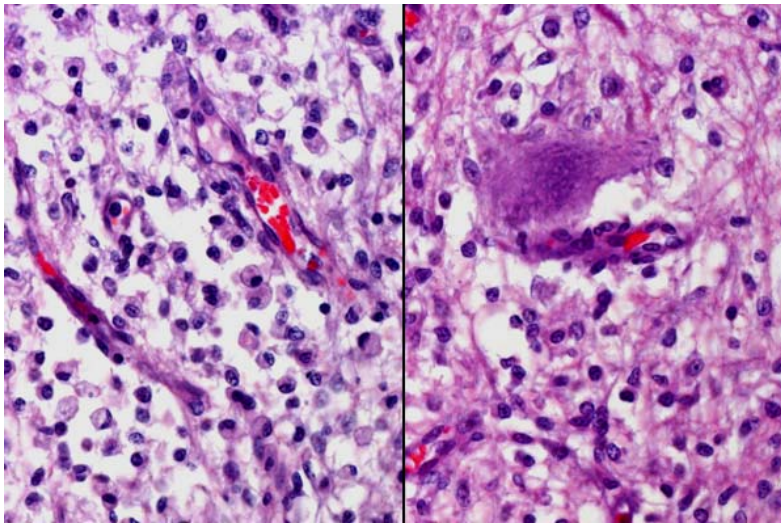
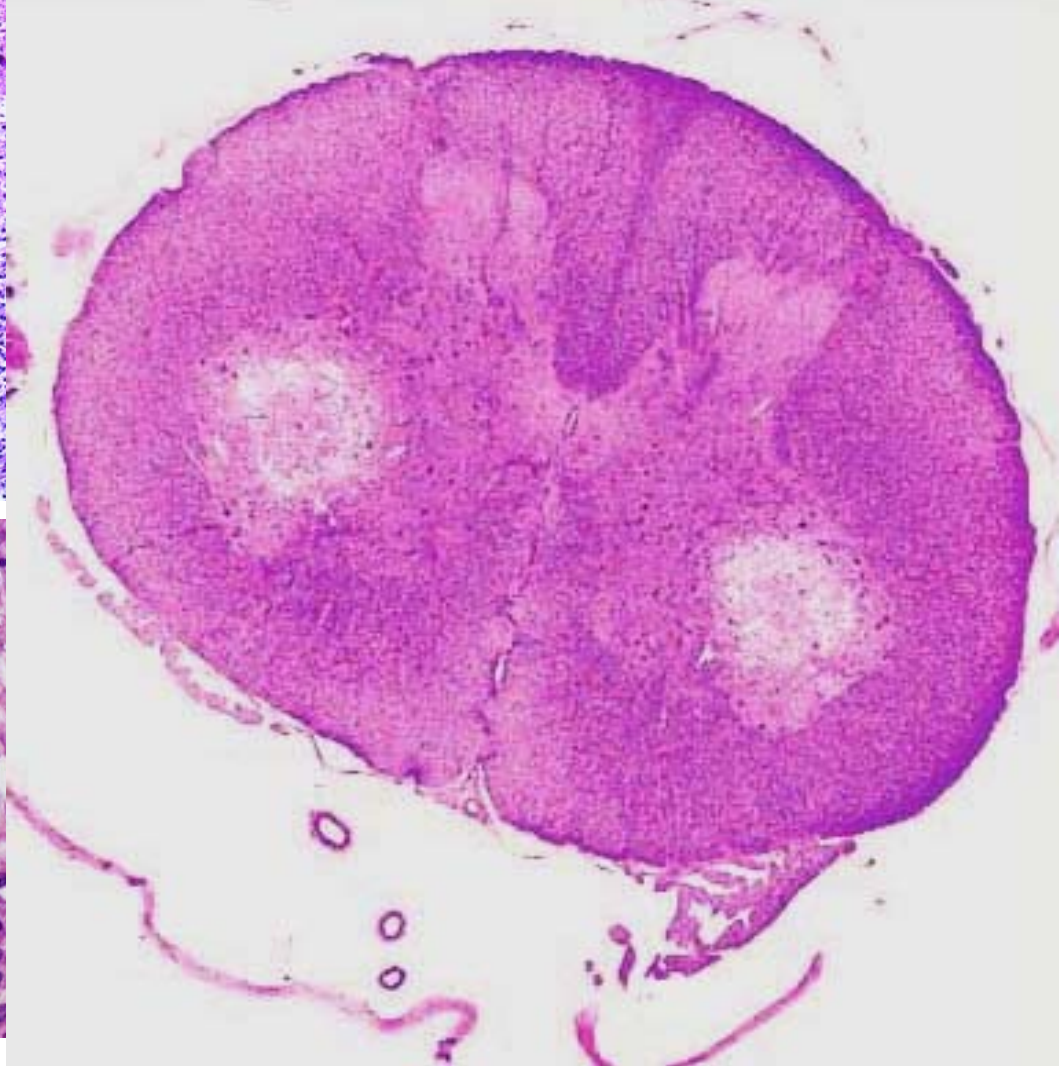
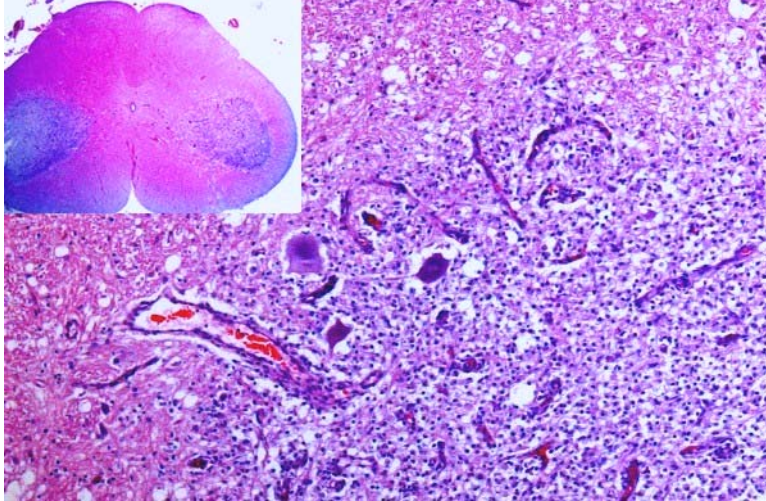
- 1) – Four significant descriptive abnormalities are: Vascular prominence due to endothelial swelling; Palor and perineuronal vacuolation of neuropil in outer cortical laminae (“cytotoxic oedema”); Numerous shrunken and eosinophilic neuronal cell bodies; Minimal hypercellularity in the subpial zone.**
- 2) – The major pathologic processes evident are acute “ischemic“-type neuronal degeneration and associated swelling of astrocytic processes. The changes are likely to be very recent in onset (<30hrs) due to the minimal cellular responses.**
- 3) – An acceptable MDx could be: “Cerebro-cortical neuronal necrosis, ischemic, acute,laminar, with cytotoxic oedema and endothelial cell hypertrophy“**



4) - Major aetiologic mechanisms that should be ruled out would include: Thiamine-related encephalopathy; Hydrogen sulphide toxicity secondary to high sulphate drinking water; Lead poisoning (the aetiology in this case); Salt poisoning, and more generally hypoglycaemia or hypoxia from whatever cause.

Comment: in this case the neuropil is still intact, so the term “polioencephalomalacia“ is not appropriate, implying as it does, wholesale tissue necrosis. This is not to say that such a lesion would not have progressed to cavitation. Note also that eosinophilic ischemic neurons can persist for many days (even weeks) before disappearing with minimal tissue response, suggesting that the process is apoptotic rather than necrotic.

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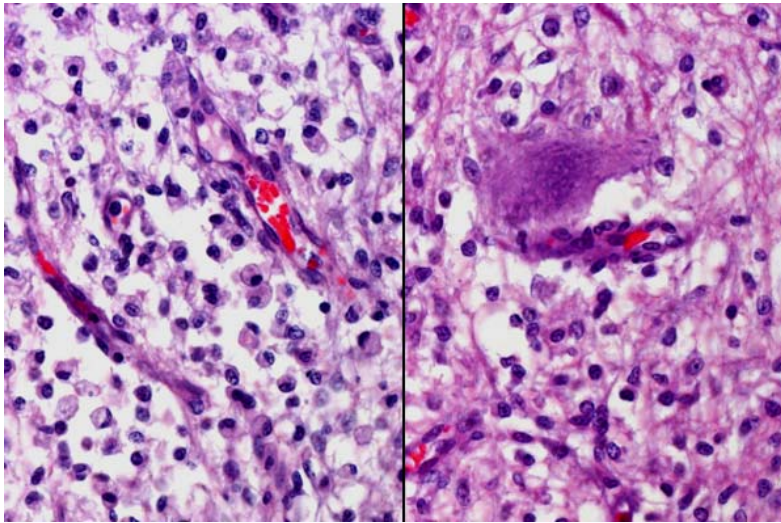
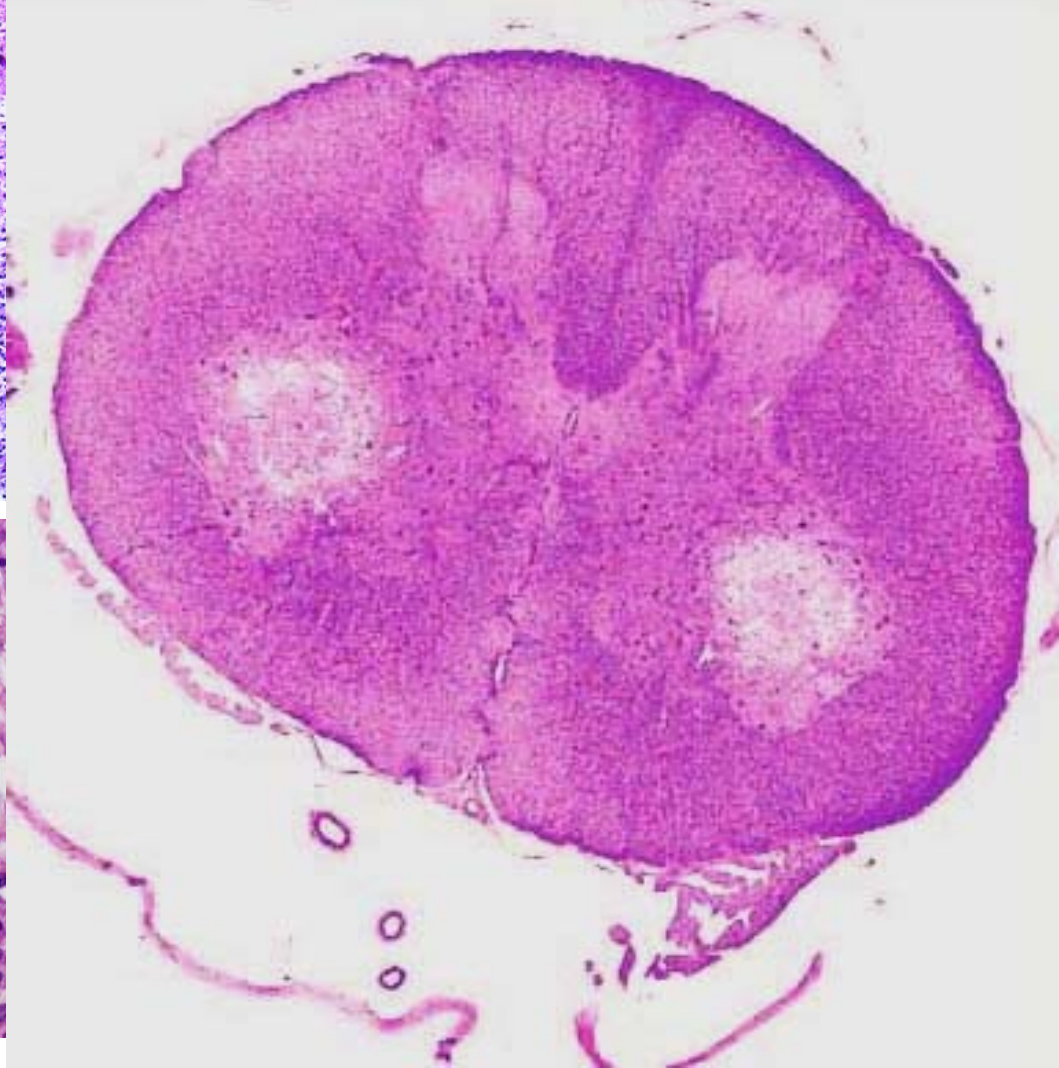
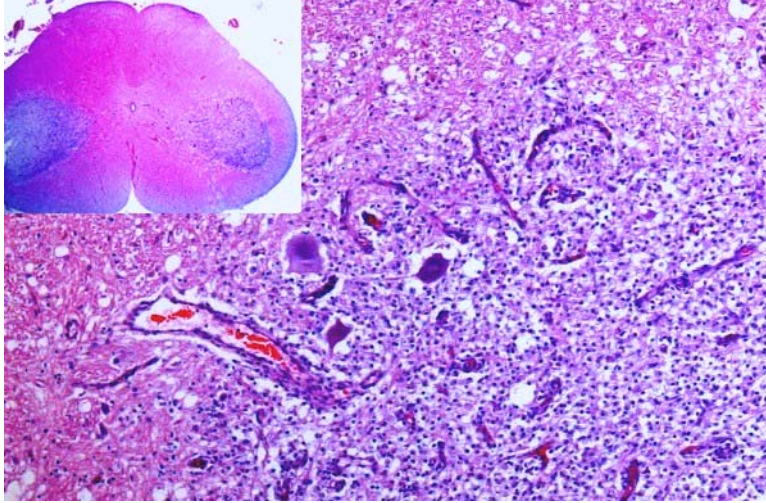


Case 4.1 – Spinal cord – initially unspecified

Review – with supplementary image – subgross spinal cord

- 1) There is bilateral symmetrical involvement of the ventral horn gray matter of the lumbar intumescence in a process of destruction of neurons and cavitation of neuropil, with vascular preservation and reactivity, and an intense Gitter cell response.
- 2) The changes shown in are consistent with a sterile necrotizing process of at least 10 days duration as judged by the Gitter cell response. Recognisable neurons do not appear to be undergoing typical ischaemic-type degeneration, and the lesion is tightly confined to the ventro-lateral grey matter. The additional image provided here shows a lesion of longer duration, as judged by the degree of cavitation.

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- 3) General pathogenetic mechanisms to suspect would be toxin-mediated injury or perhaps an inborn metabolic defect. The perfect symmetry, lack of ischaemic neuronal injury, or involvement of adjacent white matter, speak against infarction/ischaemic injury.
- 4) The diagnosis in this case was segmental, symmetrical poliomyelomalacia due to Selenium poisoning in a pig.
- Comment: This disease highlights the sharp regional metabolic differences in the CNS that show up in many toxic/metabolic disorders. In this case it is not only localised to ventral gray matter, but within it as well, affecting those regions whose neurons supply the more distal muscles of the limbs.

Case 4.3 – Spinal cord - unspecified

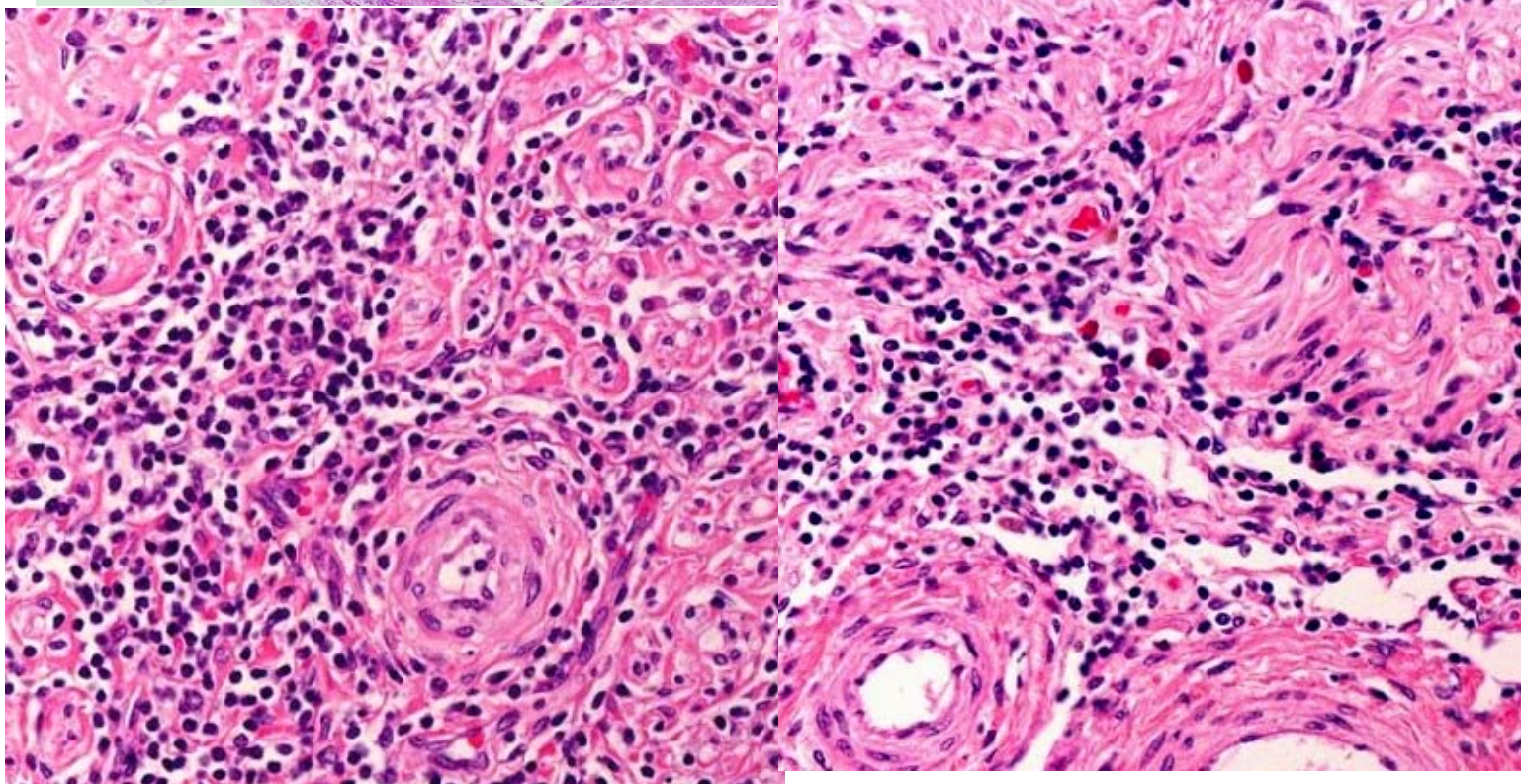
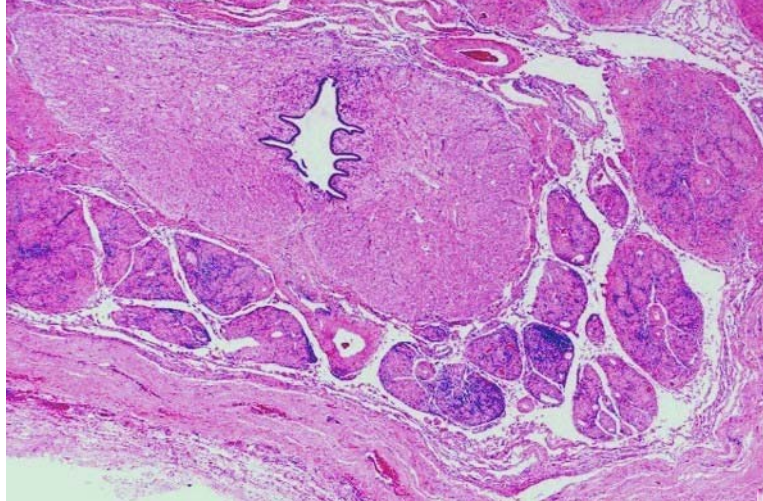
Review – with supplementary image – gross spinal cord and nerves

1) Changes illustrated are marked irregular thickening of nerves of the cauda equina, related to variable cellular infiltration and fibrosis. Infiltrating cells appear predominantly lymphoid. Additional gross image reveals involvement of both intra- and extradural nerve segments, the latter more striking.

2) Possible processes are chronic inflammatory or neoplastic infiltration

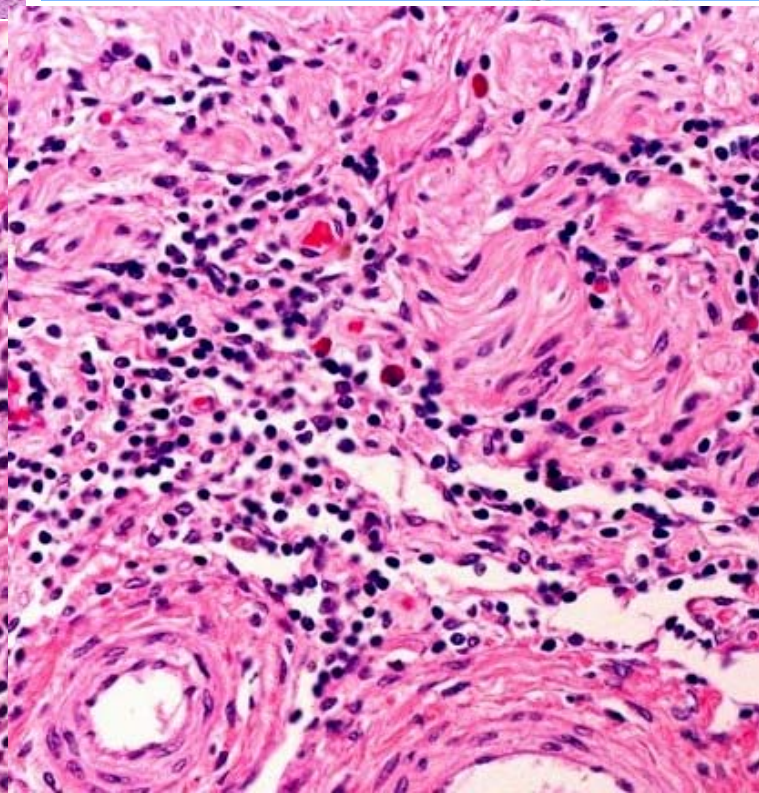
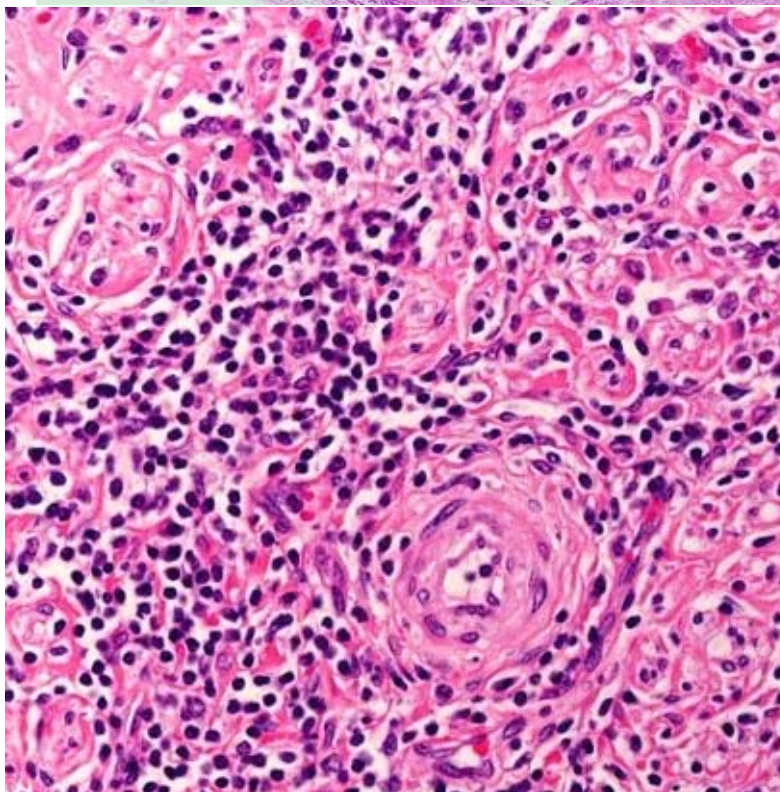
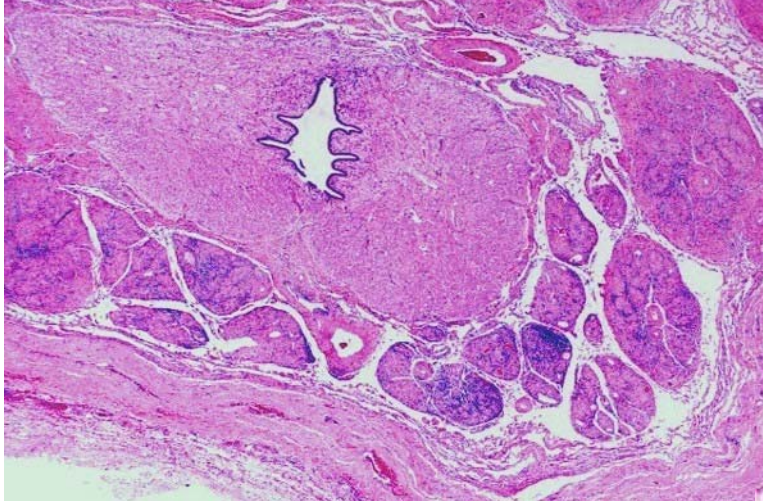
3) An acceptable MDx based on the illustrations provided could be “Polyneuritis, chronic, sclerosing, hypertrophic, predominantly lymphocytic – cauda equina”

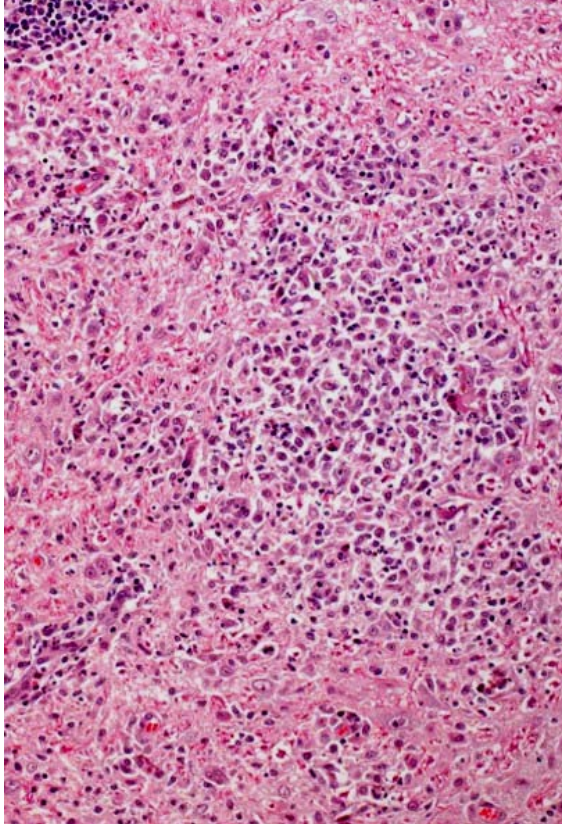
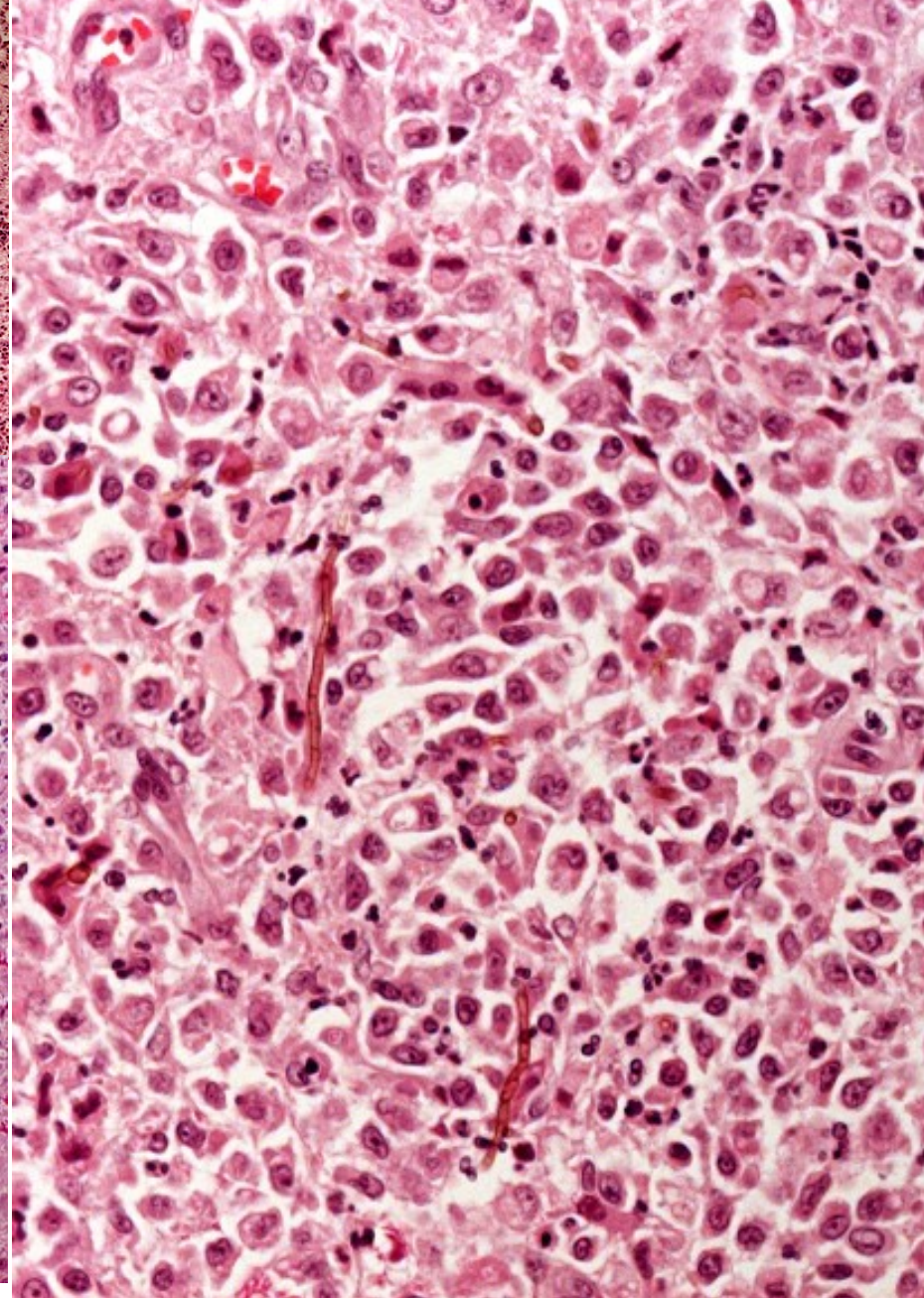
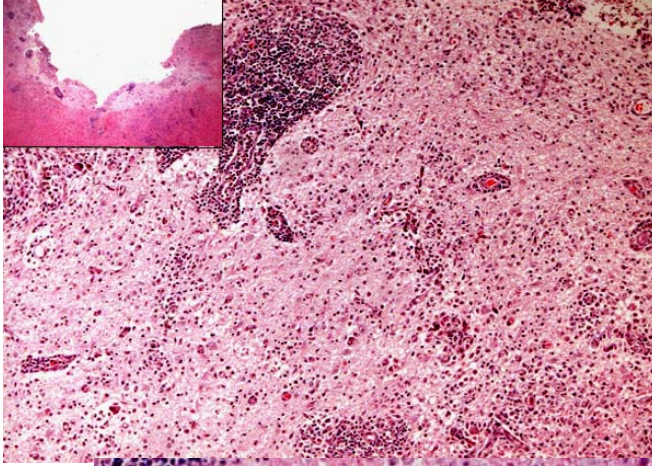
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4) The lesions illustrated are consistent with equine cauda equina neuritis, which was the diagnosis in this case. In addition, equine eosinophils can be seen in one of the panels. Comment: Infiltrates in this sporadic disease may also contain plasma cells, macrophages, giant cells and neutrophils in addition to lymphocytes and eosinophils. It is assumed to reflect an immune-mediated process.

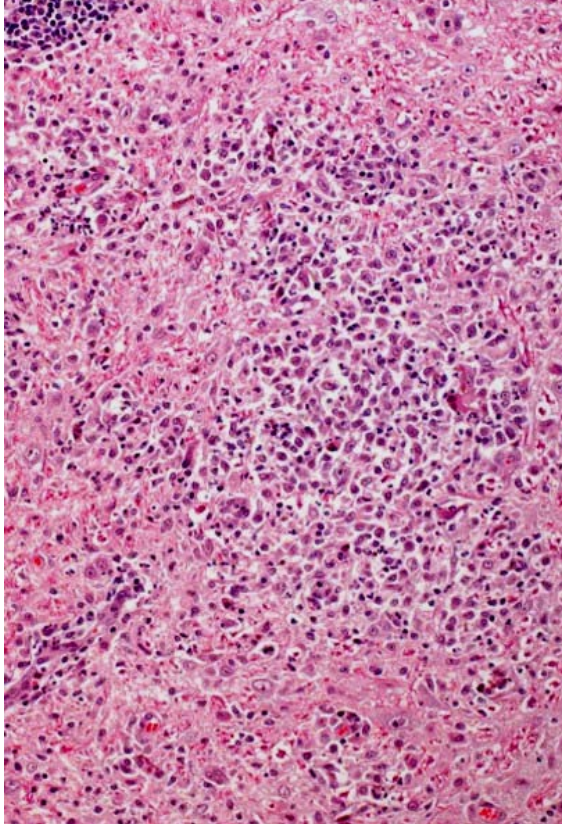
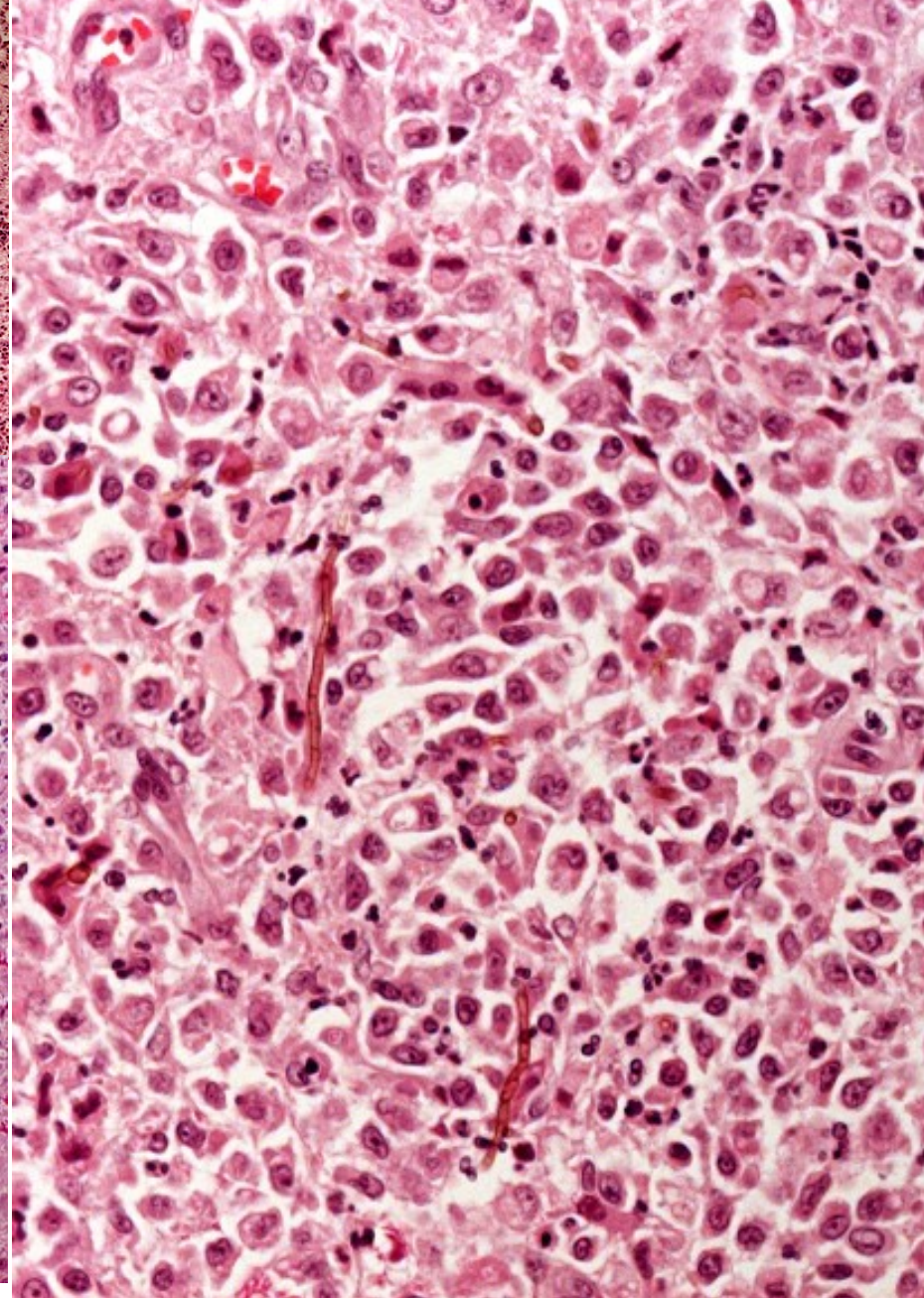
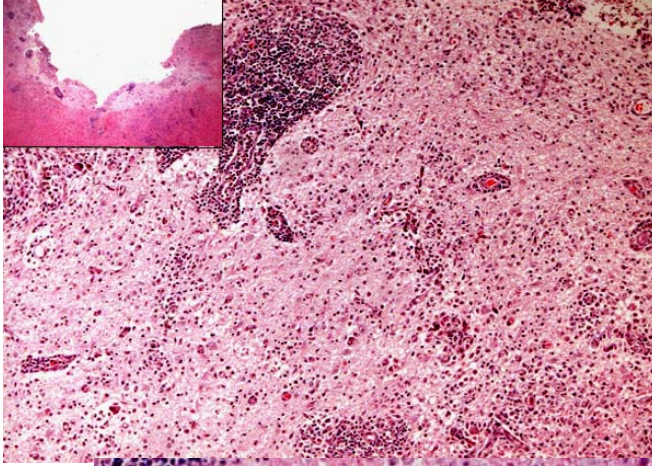




Case 4.1 –Caudal brainstem of a cat. The only lesioned area was in the region shown Review – with supplementary image – additional features at high magnification.

The features are: locally extensive and variable cellular infiltration around the fourth ventricle, with dense perivascular cuffing and extensive parenchymal destruction associated with a mixed infiltrate dominated by macrophages and neutrophils.

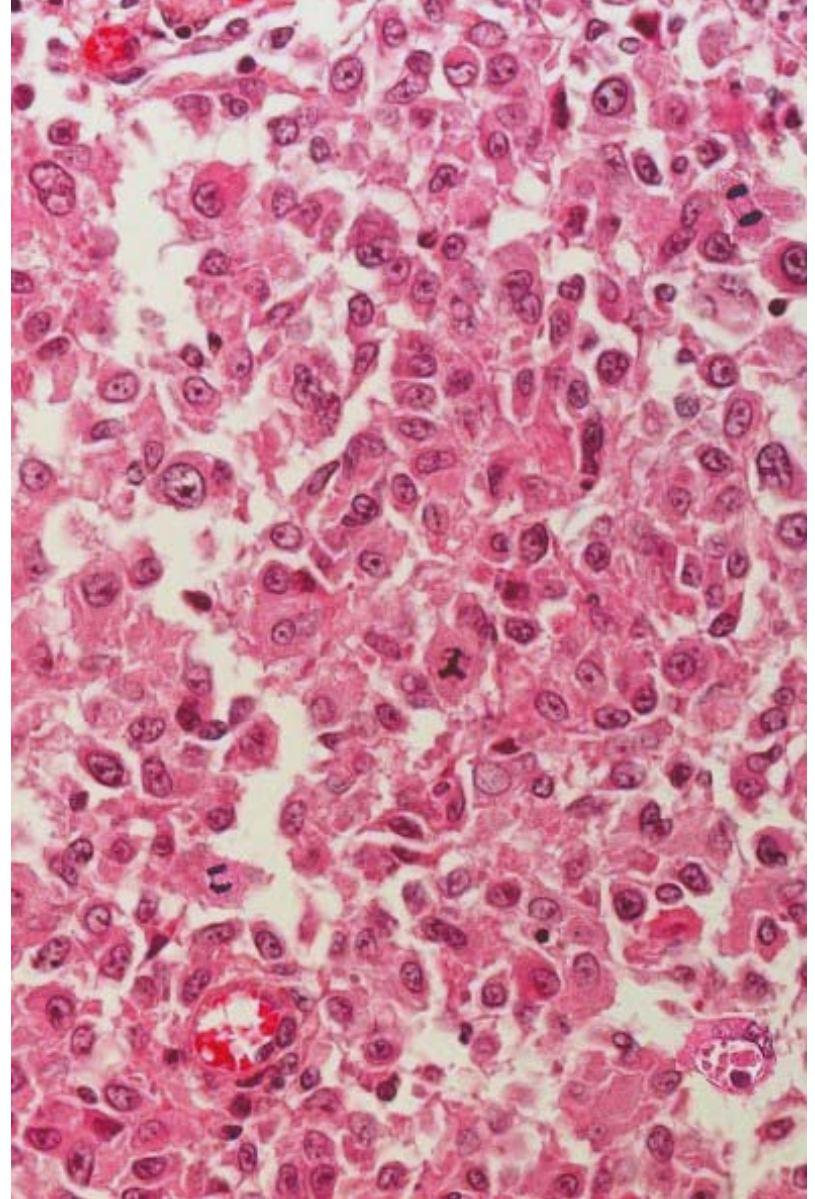
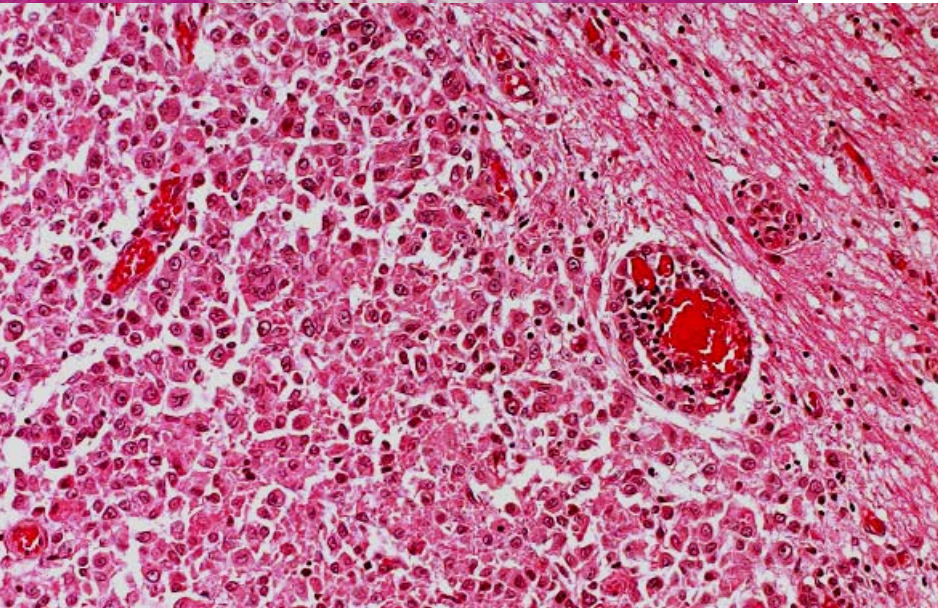
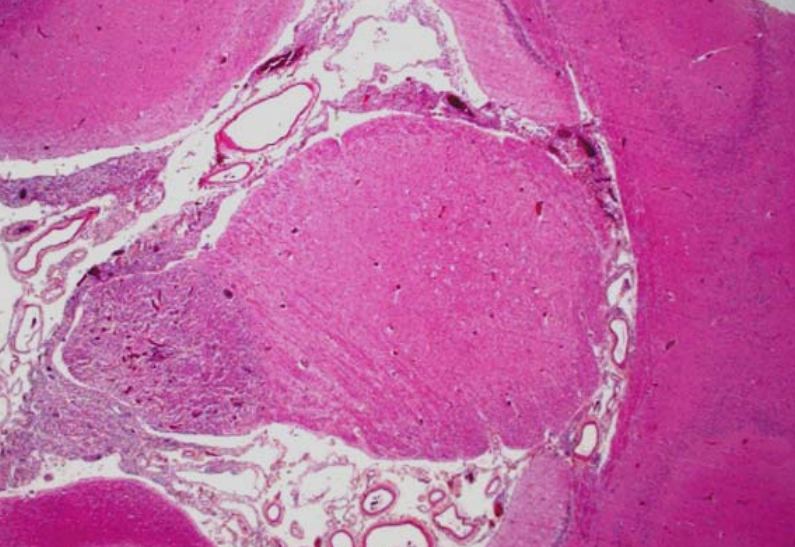
2) The pathologic process is severe destructive subacute to chronic inflammation. An acceptable MDx could be “Encephalitis, locally extensive, subacute, severe, pyogranulomatous, with intralésional fungal hyphae“ (continued next slide)



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3) The presumptive etiologic diagnosis in this case was “Phaeohyphomycosis“, based on the pigmented, septate hyphae seen in the lesion, and shown here in the additional image. Careful examination of the equivalent test image will reveal visible hyphae

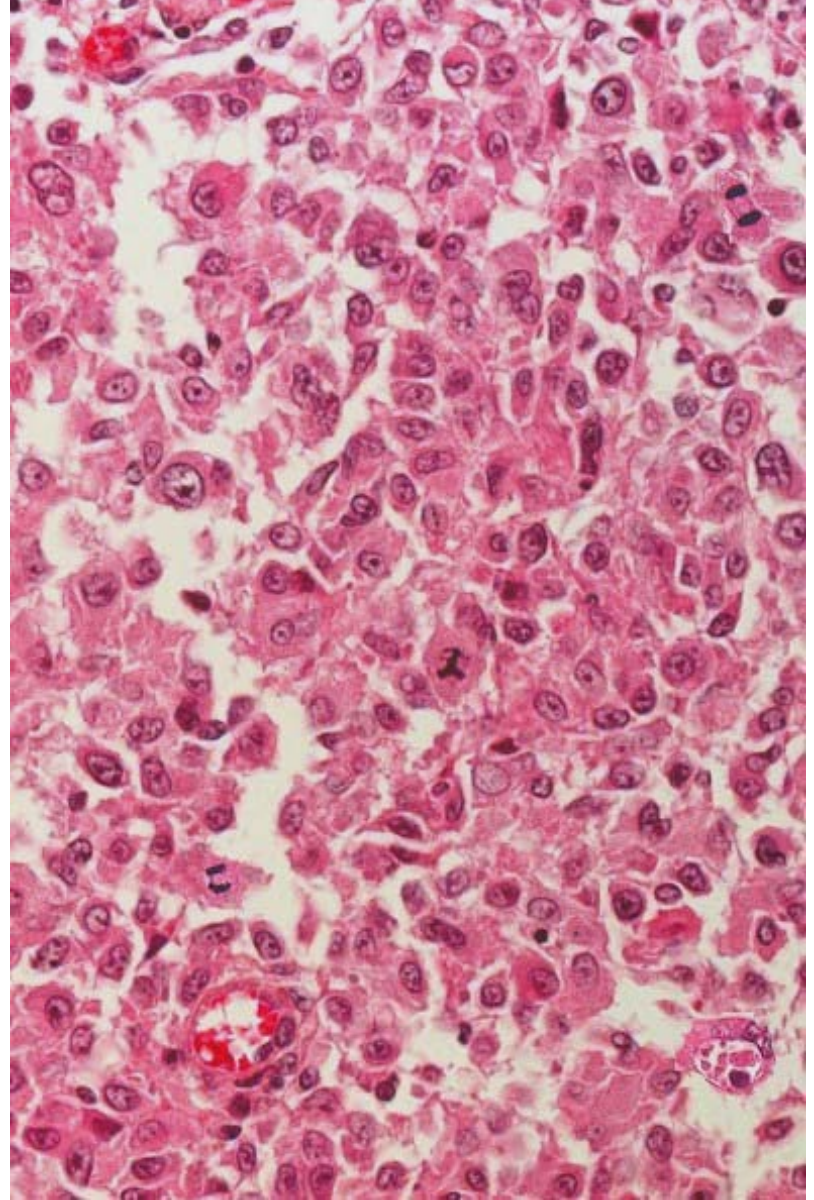
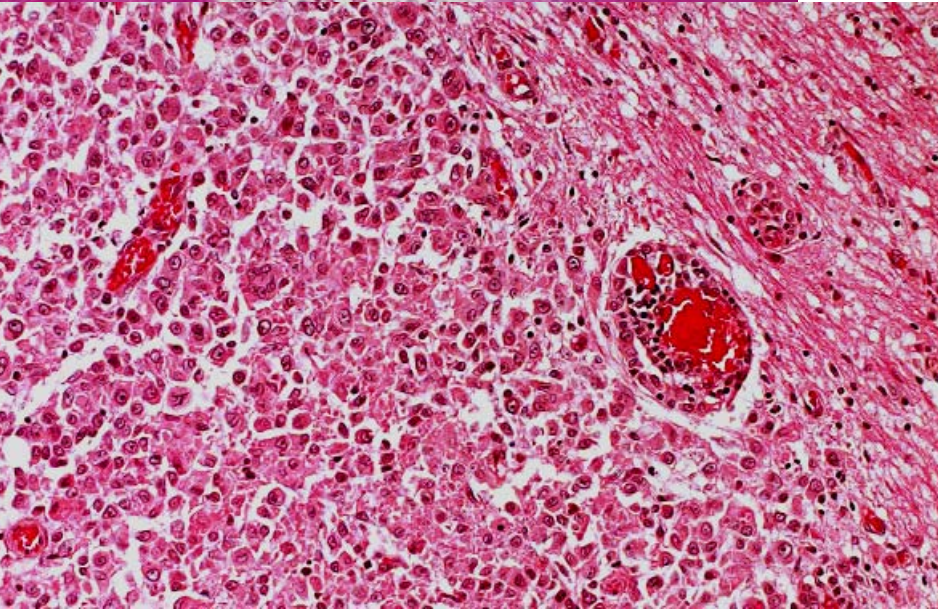
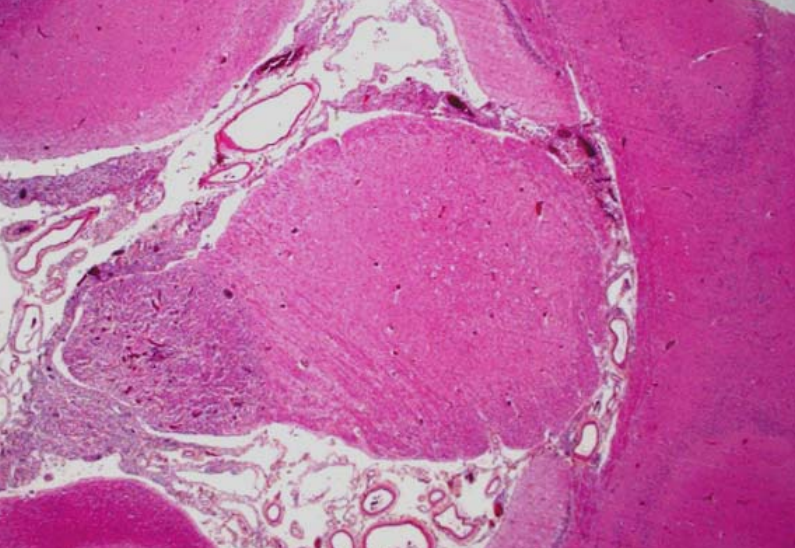
Comment: Mycotic lesions in the CNS are typified by reactions such as this. An additional feature with some organisms is vasculitis with thrombosis and infarction. Phaeohyphomycotic encephalitis, although uncommon, is a well recognized sporadic disease in the cat.



Case 4.5 – Hippocampus/Thalamus of a dog

Review –

The images reveal a locally extensive and destructive cellular infiltration of the neuroparenchyma and adjacent leptomeninges. Infiltrating cells are large and pleomorphic, with round to ovoid to irregularly lobated nuclei and large amounts of pale eosinophilic cytoplasm. In the high magnification field on the right there are three mitotic figures, including an abnormal one. Phagocytic activity by neoplastic cells is evident at the lower right. These findings are consistent in general with malignant neoplasia, and more specifically with metastatic round cell neoplasia. (continued next slide)



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- 2) The features are strongly suggestive of Histiocytic Sarcoma – the diagnosis in this case. Multinucleated cells, often conspicuous were not frequent in this case. Diagnosis could be confirmed immunohistochemically using markers such as CD18, Lysozyme, or Mac387.
- 3) This brain lesion is likely to be part of disseminated multiorgan involvement, in the disease known as Malignant Histiocytosis. Breeds most often affected are Bernese Mountain Dogs, Rottweilers, and Golden, Labrador and Flat-coated retrievers.